THE SHOPS AT BROADWAY RETAIL PROJECT

Draft Environmental Impact Report

SCH No. 2012072062

Prepared for
The City of Oakland

August 16, 2013

CITY OF OAKLAND

Department of Planning and Building
Planning and Zoning Division
250 Frank H. Ogawa Plaza, Suite 3315, Oakland, California, 94612-2032

COMBINED NOTICE OF RELEASE AND AVAILABILITY OF THE DRAFT ENVIRONMENTAL IMPACT REPORT AND NOTICE OF PUBLIC HEARING ON THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE SHOPS AT BROADWAY RETAIL PROJECT

PROJECT TITLE:	**The Shops at Broadway Retail Project**
PROJECT SPONSOR:	**Portfolio Development Partners LLC**
CASE NOS.:	**CMDV13-194; TPM10164; ER12-0007**
PROJECT LOCATION:	**3001-3039 Broadway, Oakland, California; northwest corner of Broadway and 30th Street. APNs 009-0705-004-00; 009-0705-005-00; 009-0705-006-00; and 009-0705-007-00.**

SUMMARY OF THE PROJECT: The Project involves the development of a new, one-story development with 36,000 square feet of high volume retail space and associated parking. Specifically, the proposed development would include a 26,000 square-foot retail anchor tenant, Sprouts Farmers Market, and an additional 10,000 square–feet currently planned to accommodate three retail tenant spaces. All retail areas would be oriented along Broadway and would be primarily accessed through a public plaza connected to the sidewalk along Broadway. Public-realm amenities proposed include landscaping, a public gathering area with café style seating for customers, as well as a plaza and garden seating for customers on the rooftop level. A total of 162 parking spaces would be provided on the ground level (18 spaces behind the retail tenant spaces), and on a rooftop parking deck accessed from an internal ramp (144 spaces). All vehicular access to the project site would be from a driveway on 30th Street, and service vehicles/trucks would exit the site and internal loading dock area via a driveway on Broadway. The project site is not listed on the Cortese List of hazardous materials sites.

ENVIRONMENTAL REVIEW: A Draft Environmental Impact Report (DEIR) has been prepared for the Project under the requirements of the California Environmental Quality Act (CEQA) pursuant Public Resources Code Section 21000 *et. seq.* The DEIR analyzes potentially significant environmental impacts in the following environmental categories: Aesthetics; Agricultural and Forestry Resources; Air Quality; Biological Resources; Cultural Resources; Geology, Soils and Geohazards; Greenhouse Gases and Climate Change; Hazards and Hazardous Materials; Hydrology and Water Quality; Land Use, Plans and Policies; Mineral Resources; Noise; Population, Housing and Employment; Public Services; Recreation; Transportation, Circulation and Parking; and Utilities and Service Systems. The DEIR identifies a significant unavoidable environmental impact related to Transportation, Circulation and Parking. Copies of the DEIR are available for review or distribution to interested parties at no charge at the Department of Planning and Building, Planning and Zoning Division, 250 Frank H. Ogawa Plaza, 2nd Floor Zoning Counter, Oakland, CA, 94612, Monday through Friday, 8:00 a.m. to 4:00 p.m. (Wednesday 9:30 a.m. to 4:00 p.m.). The DEIR may also be reviewed at the following website: http://www2.oaklandnet.com/Government/o/PBN/OurServices/Application/DOWD009157.

PUBLIC HEARING:

The City Planning Commission will conduct a public hearing on the DEIR on **September 11, 2013**, at **6:00 p.m.** in the City Council Chambers, City Hall, 1 Frank H. Ogawa Plaza, Oakland, CA.

The City of Oakland is hereby releasing the DEIR, finding it to be accurate and complete and ready for public review. Members of the public are invited to comment on the DEIR and the project. There is no fee for commenting, and all comments received will be considered by the City prior to finalizing the EIR and making a decision on the project. Comments on the DEIR should focus on the sufficiency of the EIR in discussing possible impacts on the physical environment, ways in which potential adverse effects might be minimized, and alternatives to the project in light of the EIR's purpose to provide useful and accurate information about such factors. Comments may be made at the public hearing described above or in writing. Please address all written comments to Peterson Vollmann, Planner III, City of Oakland, Department of Planning and Building, Planning and Zoning Division, 250 Frank H. Ogawa Plaza, Suite 2214, Oakland, CA, 94612; (510) 238-4730 fax or e-mailed to pvollmann@oaklandnet.com. Comments should be received no later than **4:00 p.m.** on **September 30, 2013**. Please reference case number **ER12-0007** in all correspondence. If you challenge the environmental document or project in court, you may be limited to raising only those issues raised at the Planning Commission public hearing described above, or in written correspondence received by the Department of Planning and Building on or prior to **4:00 p.m.** on **September 30, 2013**.

After all comments are received, a Final EIR will be prepared and the Planning Commission will consider certification of the Final EIR and render a decision on the project at a later meeting date to be scheduled. For further information, please contact Peterson Vollmann, Planner III, at (510) 238-6167 or pvollmann@oaklandnet.com.

Scott Miller

August 16, 2013

SCOTT MILLER
Zoning Manager
Environmental Review Officer

Notice of Completion and Environmental Document Transmittal (Appendix C)

For US Mail: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044
For Hand Delivery: 1400 Tenth Street, Sacramento, CA 95814 (916) 445-0613

SCH# 2012072062

Project Title: The Shops at Broadway Retail Project

Lead Agency: City of Oakland, Department of Planning and Building-Planning and Zoning Division
Contact Person: Peterson Vollmann, Planner
Street Address: 250 Frank H. Ogawa Plaza – Suite 2114
Phone: (510) 238-6167
City: Oakland, California Zip Code: 94612 County: Alameda

Project Location

County: Alameda City/Nearest Community: Oakland
Cross Streets: Broadway and 30th Street Zip Code: 94611 Total Acres: 1.9
Assessor's Parcel No. 009-0705-004-00; 009-0705-005-00; 009-0705-006-00; and 009-0705-007-00 Section: Twp: Range: Base:

Within 2 Miles: State Hwy #: I-580/I-980 Waterways: None
Airports: No Railways: No Schools: Yes

Document Type

CEQA:
- ☐ NOP
- ☐ Early Cons
- ☐ Neg Dec
- ☐ MitNeg Dec
- ☒ Draft EIR
- ☐ Supplemental/Subsequent
- ☐ EIR (Prior SCH No.)
- ☐ Other:

NEPA:
- ☐ NOI
- ☐ EA
- ☐ Draft EIS
- ☐ FONSI

Other:
- ☐ Joint Document
- ☐ Final Document
- ☐ Other

Local Action Type

- ☐ General Plan Update
- ☐ General Plan Amendment
- ☐ General Plan Element
- ☐ Community Plan
- ☐ Specific Plan
- ☐ Master Plan
- ☐ Planned Unit Development
- ☒ Site Plan
- ☐ Rezone
- ☐ Prezone
- ☒ Use Permit
- ☒ Land Division (Subdivision, Parcel Map, Tract Map, etc.)
- ☐ Annexation
- ☐ Redevelopment
- ☐ Coastal Permit
- ☐ Other

Development Type

- ☐ Residential: *Units* ___ *Acres* ___
- ☐ Office: *Sq. ft.* ___ *Acres* ___ *Employees* ___
- ☒ Commercial: *Sq. ft.* 36,000 (retail) *Acres* 1.9 *Employees* 76
- ☐ Industrial: *Sq. ft.* ___ *Acres* ___ *Employees* ___
- ☐ Educational:
- ☐ Recreational:
- ☐ Water Facilities: *Type*
- ☐ Transportation: *Type*
- ☐ Mining: *Mineral*
- ☐ Power: *Type* ___ *Watts* ___
- ☐ Waste Treatment: *Type*
- ☐ Hazardous Waste: *Type*
- ☐ Other

Total Acres (approx.) 1.9

Project Issues Discussed in Document

- ☒ Aesthetic/Visual
- ☒ Agricultural Land
- ☒ Air Quality
- ☒ Archaeological/Historical
- ☐ Coastal Zone
- ☒ Drainage/Absorption
- ☒ Economic/Jobs
- ☐ Fiscal
- ☒ Flood Plain/Flooding
- ☒ Forest Land/Fire Hazard
- ☒ Geologic/Seismic
- ☒ Minerals
- ☒ Noise
- ☒ Population/Housing Balance
- ☒ Public Services/Facilities
- ☒ Recreation/Parks
- ☒ Schools/Universities
- ☐ Septic Systems
- ☒ Sewer Capacity
- ☒ Soil Erosion/Compaction/Grading
- ☒ Solid Waste
- ☒ Toxic/Hazardous
- ☒ Traffic/Circulation
- ☒ Vegetation
- ☒ Water Quality
- ☒ Water Supply/Groundwater
- ☒ Wetland/Riparian
- ☒ Wildlife
- ☒ Growth Inducing
- ☒ Land Use
- ☒ Cumulative Effects
- ☐ Other:

Present Land Use/Zoning/General Plan Designation: Present Zoning is "Community Commercial Zone 2" / "Overlay Broadway District" (CC-2/D-BR). Present General Plan Designation is "Community Commercial."

Project Description: The Project involves the development of a new, one-story development with 36,000 square feet of high volume retail space and associated parking. Specifically, the proposed development would include a 26,000 square-foot retail anchor tenant, Sprouts Farmers Market, and an additional 10,000 square–feet currently planned to accommodate three retail tenant spaces. All retail areas would be oriented along Broadway and would be primarily accessed through a public plaza connected to the sidewalk along Broadway. Public-realm amenities proposed include landscaping, a public gathering area with café style seating for customers, as well as a plaza and garden seating for customers on the rooftop level. A total of 162 parking spaces would be provided on the ground level (18 spaces behind the retail tenant spaces), and on a rooftop parking deck accessed from an internal ramp (144 spaces). All vehicular access to the project site would be from a driveway on 30th Street, and service vehicles/trucks would exit the site and internal loading dock area via a driveway and exit onto Broadway. The project site is not listed on the Cortese List of hazardous materials sites.

Suggested Distribution

- ☒ Air Resources Board
- ☒ Caltrans District #4
- ☒ Caltrans Planning
- ☐ Fish & Game Region #3
- ☐ Housing & Community Development
- ☒ Native American Heritage Commission
- ☐ Office of Historic Preservation
- ☐ Office of Emergency Services
- ☒ Regional WQCB #2
- ☐ SWRCB: Water Quality
- ☐ Toxic Substances Control, Department of

Public Review Period

Starting Date: Friday, August 16, 2013 Ending Date: Monday, September 30, 2013

Lead Agency:

City of Oakland
Department of Planning and Building- Planning and Zoning Division
250 Frank H. Ogawa Plaza – Suite 2114
Oakland, CA 94612

Contact: Peterson Vollmann, Planner
Phone: (510) 238-6167
pvollmann@oaklandnet.com

Project Applicant:

Portfolio Development Partners LLC
Jeff Neustadt
1330 Broadway Suite 1050
Oakland, CA 94612
925-939-3010

Signature of Lead Agency Representative Scott Miller Date: 8-13-13

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List of Acronyms and Abbreviations

AADT	average annual daily traffic
AB	Assembly Bill
ABAG	Association of Bay Area Governments
A/C	Asphalt & Concrete
ACCWP	Alameda County Clean Water Program
ACDEH	Alameda County Department of Environmental Health
ACFCWCD	Alameda County Flood Control and Water Conservation District
ACM	asbestos containing material
ACTC	Alameda County Transportation Commission
ACWMA	Alameda County Waste Management Authority
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
afem	Artificial fill over estuarine mud
APG	Adaption Policy Guide
API	Area of Primary Importance
ARB	Air Resources Board
ARDTP	Archaeological Research Design and Treatment Plan
ASCE	American Society of Civil Engineers
ASI	Area of Secondary Importance
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BCDC	Bay Conservation and Development Commission
BMP	Best Management Practice or Bicycle Master Plan
BRT	Bus Rapid Transit
CAAQS	California Ambient Air Quality Standards
CALGreen	California Green Building Standards
Cal/OSHA	California Occupational Safety and Health Administration
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CAT	Climate Action Team
CASQA	California Stormwater Quality Association
CBC	California Building Code
CBD	Central Business District
CBTP	Community-Based Transportation Plan
CCAA	California Clean Air Act
CCCC	California Climate Change Center

CCR	California Code of Regulations
CCTP	Climate Change Technology Program
C&D	Construction and Demolition
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDMG	California Department of Mines and Geology
CDSR	Construction and Demolition Summary Report
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERES	California Environmental Resources Evaluation System
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CERC-NFRAP	CERCLIS No Further Remedial Action Planned
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	methane
CHMIRS	California Hazardous Materials Incident Report System
CHP	California Highway Patrol
CIP	Capital Improvement Project
cm	Centimeter
CMP	Congestion Management Program
CNEL	Community Noise Equivalent Level
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO-CAT	Coastal and Ocean Working Group of the California Climate Action Team
CO2	carbon dioxide
CO_2e	carbon dioxide equivalents
Corps	U.S. Army Corps of Engineers
CRHR	California Register of Historic Resources
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
dbh	diameter at breast height
DHS	Department of Health Services
DNL	Day/Night Average Sound Level
DOT	Department of Transportation
DPM	diesel particulate matter
DPR	Department Parks and Recreation
DSOD	Division of Safety of Dams

DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utilities District
EBRPD	East Bay Regional Parks District
ECAP	Energy and Climate Action Plan
EIR	Environmental Impact Report
E.O.	Executive Order
EPA	Environmental Protection Agency
FAR	Floor-area Ratio
FCAA	Federal Clean Air Act
FDDC	Fire Department Dispatch Center
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FIP	Federal Implementation Plan
FTA	Federal Transit Authority
FUDS	Formerly Used Defense Sites
FY	Fiscal Year
GHG	greenhouse gas
GMNA	Greater Mosswood Neighborhood Association
GWP	global warming potential
HABS	Historic American Building Survey
HAP	Hazardous Air Pollutant
HCM	Highway Capacity Manual
HFC	hydrofluorocarbon
HMARRP	Hazardous Materials Assessment Report and Remediation Plan
HMBP	Hazardous Materials Business Plan
HMMP	Hazardous Materials Management Plan
HMP	hydrograph modification management plan
HPE	Historic Preservation Element
HRA	Health Risk Assessment
HV	heating and ventilation
Hz	hertz
I-580	Interstate 580
I-980	Interstate 980
IBC	International Building Code
ICLEI	Local Governments for Sustainability (formerly International Council for Local Environmental Initiatives)
I&I	Inflow and Infiltration
IPCC	International Panel on Climate Change
ITE	Institute of Transportation Engineers

kV	kilovolt
L_{50}	noise level that is equaled or exceeded 50 percent of the specified time
L_{90}	noise level that is equaled or exceeded 90 percent of the specified time
L_{eq}	equivalent sound level
L_{max}	instantaneous maximum noise level
LCFS	Low Carbon Fuel Standards
LEED	Leadership in Energy and Environmental Design
LID	low impact development
LOS	level of service
LS	Less than Significant
LUFT	leaking underground storage tank
LUST	leaking underground storage tank
LUTE	Land Use and Transportation Element
M	Richter Magnitude
mgd	million gallons per day
MM	Modified Mercalli
MMT	million metric tons
MRP	Municipal Regional Stormwater NPDES Permit
mph	miles per hour
MPO	metropolitan planning organization
MSDS	Materials Safety Data Sheets
MT	metric tons
MTC	Metropolitan Transportation Commission
MTS	Metropolitan Transportation System
MUTCD	Manual on Uniform Traffic Control Devises
Mw	Moment Magnitude
MXD	mixed-use development
N	No Impact
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NASA	National Aeronautics and Space Administration
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NOI	Notice of Intent
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System

NPL	National Priorities List
NRCS	Natural Resource Conservation Service
NRDC	Natural Resources Defense Council
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
O_3	ozone
OCHS	Oakland Cultural Heritage Survey
ODP	Operational Diversion Plan
OEHHA	Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OFD	Oakland Fire Department
OHP	Office of Historic Preservation
OMC	Oakland Municipal Code
OPD	Oakland Police Department
OPR	Office of Planning and Research/also [Oakland] Office of Parks and Recreation
OSCAR	Open Space, Conservation and Recreation Element
OSHA	Occupational Safety and Health Administration
OUSD	Oakland Unified School District
Qf	Late Pleistocene to Holocene alluvium
Qof	Early to Middle Pleistocene alluvium
Qmt	Pleistocene marine terrace
Pb	lead
PCB	polychlorinated biphenyl
PCM	parallel climate model
pc/mi/ln	Passenger cars per mile per lane
PDHP	Potential Designated Historic Properties
PeMS	(Caltrans) Performance Measurement Systems
PFC	perfluorocarbon
PGA	peak ground acceleration
PG&E	Pacific Gas & Electric
PM	particulate matter
PM2.5	fine particular matter (that is less than 2.5 microns in diameter)
PM10	particulate matter (that is 10 microns or less in diameter)
PMP	Pedestrian Master Plan
PMPL	Proposed National Priorities List
PPD	pounds per day
ppm	part(s) per million
PRC	Public Resources Code
PS	Potentially Significant
PS&E	Plans, Specifications, and Estimates
PSHA	probabilistic seismic hazard assessment
PUC	Public Utilities Commission

PWA	Public Works Agency
RCRA	Resource Conservation and Recovery Act
R&D	Research and Development
RMP	Risk Management Plan
ROG	reactive organic gases
ROW	right(s)-of-way
RRFB	Rectangular Rapid Flash Beacons
RWQCB	Regional Water Quality Control Board
S	Significant
SAAQS	State Ambient Air Quality Standards (California)
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SCA	Standard Condition of Approval
SCS	Sustainable Communities Strategy
SDC	Seismic Design Category
SDMP	Storm Drainage Master Plan
SDWA	Safe Drinking Water Act
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SLIC	Spills, Leaks, Investigations, and Cleanup
SMARA	Surface Mining and Reclamation Act
SO2	sulfur dioxide
SOV	single-occupant vehicle
SPCC	Spill Prevention, Control and Countermeasure
SR-24	State Route 24
SSES	Sewer System Evaluation Survey
SU	Significant Unavoidable
SWITRS	Statewide Integrated Traffic Records System
SWP	State Water Program
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TAZ	traffic analysis zones
TDM	transportation demand management
TDR	Transfer of Development Rights
TMDL	Total Maximum Daily Load
TPMA	Transportation and Parking Management Agency
TRB	Transportation Research Board
TSCA	Toxic Substances Control Act
UCMP	University of California Museum of Paleontology
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USPS	U.S. Postal Service
UST	underground storage tank
UWMP	Urban Water Management Plan
v/c	volume to capacity
VI	moderate ground shaking
VII	produced strong ground shaking
VIII	very strong ground shaking
IX	violent ground shaking
VMT	vehicle miles traveled
vph	vehicles per hour
VTR	vehicle trip reductions
WBWG	Western Bat Working Group
WMAC	Waste Management of Alameda County
WRRP	Waste Reduction and Recycling Plan
WSA	Water Supply Assessment
WSMP	Water Supply Management Program

CHAPTER 1
Introduction

1.1 Project Overview

The City of Oakland ("City") as the Lead Agency prepared this Environmental Impact Report ("EIR") to address the physical and environmental effects of the Shops at Broadway Project (Project). The Project would develop a 1.9-acre lot at the northeast corner of Broadway and 30th Street in Oakland with a new, one-story development with 36,000 square feet of high volume retail space and associated parking that would occupy the majority of the project site. Specifically, the Project would include a 26,000 square-foot retail anchor tenant, Sprouts Farmers Market (Sprouts), and a separate 10,000 square-foot commercial building currently planned to accommodate three retail tenant spaces. Chapter 3, *Project Description*, of this document presents a detailed description of the Project.

1.2 Environmental Review

The City of Oakland is the Lead Agency for this EIR (pursuant to State and local guidelines for implementing the California Environmental Quality Act [CEQA]), and has determined that the Shops at Broadway Project is subject to CEQA (Public Resources Code Section 21000, et seq.) and the State CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, Section 15000, et seq.) promulgated thereunder (together "CEQA").

The City elected not to prepare an Initial Study Checklist to reduce the scope of the EIR, as permitted by Section 15060(d) of the CEQA Guidelines. This EIR addresses all environmental topics identified in the City of Oakland's CEQA Thresholds/Criteria of Significance document. The analysis in this EIR relies on previously adopted environmental impact reports (EIRs) such as the Land Use and Transportation Element (LUTE) EIR (City of Oakland, 1998), the Safety Element Initial Study/Negative Declaration (City of Oakland, 2004), and is further informed by certain analyses in the certified Alta Bates Summit Medical Center, Summit Campus Seismic Upgrade and Master Plan Project EIR and the Proposed Amendments to the Broadway/MacArthur/San Pablo Redevelopment Plan Project Draft EIR.

CEQA requires the analysis of potential adverse effects of a project on the environment. Potential effects of the environment on a project are legally not required to be analyzed or mitigated under CEQA. However, this EIR nevertheless analyzes potential effects of "the environment on the project" in order to provide information to the public and decision-makers. Where a potential significant effect of the environment on the project is identified, the document, as appropriate, identifies City Standard Conditions of Approval and/or project-specific non-CEQA recommendations to address these issues.

Use of this EIR

Pursuant to CEQA, this EIR is a public information document prepared for use by governmental agencies and the public to identify and evaluate potential environmental consequences of the development of the Project, to evaluate and recommend mitigation measures that would substantially lessen or eliminate significant environmental adverse impacts, and to examine a reasonable range of feasible alternatives to the Project. This EIR is intended to provide the information and objective environmental analysis necessary to assist the Lead Agency, the City of Oakland, in considering all the approvals and actions necessary to approve the Project. It is prepared to aid and streamline the review and decision-making process by disclosing the potential for significant environmental impacts to occur with implementation of the Project. The information contained in this Draft EIR is subject to review and consideration by the City of Oakland and any other responsible agency prior to the City's decision to approve, reject or modify the Project.

EIR Scoping

On July 27, 2012, the City of Oakland issued a Notice of Preparation (NOP), to inform agencies and interested parties of its intent to prepare and distribute a "Draft EIR for the Shops at Broadway Development Project." The NOP was distributed to governmental agencies, organizations, and persons interested in the Project. The City sent the NOP to agencies with statutory responsibilities in connection with the Project and requested their input on the scope and content of the environmental information that should be addressed in the EIR. The City of Oakland Planning Commission held a public hearing on August 29, 2012, to accept comments regarding the scope of the EIR in response to the NOP. The NOP review period ended on August 31, 2012. The NOP and written and oral comments that the City received in response to the NOP are included as Appendix A to this Draft EIR, which addresses all comments received in response to the NOP that are relevant to environmental issues. During the public scoping process for this EIR, no specific areas of controversy arose that are relevant to this CEQA analysis.

Public Review

This Draft EIR is available for public review and comment for the period identified on the Notice of Release/Availability of Draft Environmental Impact Report accompanying this document (45 calendar days, Friday August 16 through Monday, September 30, 2013). During the public review and comment period, written comments on the Draft EIR may be submitted to the City at the address indicated on the notice. Oral comments may be stated at the public hearing on the Draft EIR, which will be held as indicated on the above-referenced notice.

Following the public review and comment period for the Draft EIR, the City will prepare responses that address all written and oral comments on the Draft EIR's environmental analyses and received within the specified review period. The responses and any other revisions to the Draft EIR will be prepared as a Responses to Comments document. The Draft EIR and its Appendices, together with the Responses to Comments document will constitute a Final EIR (commonly referred to collectively as "EIR") for the Shops at Broadway Project.

1.3 CEQA Review and Approval

Prior to approving the Project, the City of Oakland must ultimately certify that it has reviewed and considered the information in the EIR and that the EIR has been completed in conformity with the requirements of CEQA. This EIR must be certified and considered by the Lead Agency before any final City decision can be made regarding Project. This EIR identified significant effects that would result from the Shops at Broadway Project. Therefore, pursuant to CEQA Guidelines Section 15091, one or more of the following findings would be required if the City decides to approve the Project:

(1) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the Final EIR.

(2) Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such agency.

(3) Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.

1.4 Organization of the Draft EIR

Following this Chapter 1, *Introduction*, this Draft EIR is organized as follows:

Chapter 2, *Summary*, contains a brief summary of the Shops at Broadway Project and allows the reader to easily reference the analysis presented in the Draft EIR. Table 2-1, Summary of Impacts, Mitigation Measures, Standard Conditions of Approval (SCAs), and Residual Impacts, is provided at the end of Chapter 2 as a reader-friendly reference to each of the environmental effects, proposed mitigation measures and residual environmental impacts after mitigation is implemented, presented by environmental topic. Chapter 2 also summarizes the alternatives analysis, areas of controversy and NOP comments received.

Chapter 3, *Project Description***,** describes in detail the project site and surroundings, the background and regulatory context of the Project. The goals and objectives of the Project also are discussed along with the relevant characteristics of the Project. Chapter 3 identifies other agencies that must consider or approve aspects of the Project.

Chapter 4, *Environmental Setting, Impacts, Standard Conditions of Approval, and Mitigation Measures*, discusses the environmental setting (existing physical conditions and regulatory framework), the environmental impacts of the Project and cumulative conditions, and the SCAs and mitigation measures that, after implementation, would reduce or eliminate significant impacts.

Chapter 5, *Alternatives*, evaluates a reasonable range of alternatives to the Project and identifies an environmentally superior alternative.

Chapter 6, *Impact Overview and Growth Inducement*, summarizes the potentially significant and unavoidable impacts and the cumulative impacts that could result with the Project, as they are identified throughout Chapter 4. Chapter 6 also describes the Project's potential for inducing growth.

Chapter 7, *Report Preparers*, identifies the authors of the EIR, including City staff and the EIR consultant team. The key consultants who provided technical resources for the EIR are also identified in this chapter.

Appendices to the Draft EIR are provided in a CD and include the NOP, a summary of responses received regarding the scope of the EIR, as well as certain supporting background documents used for the impact analyses for specific topics. All reference documents and persons contacted to prepare the EIR analyses are listed at the end of each analysis section in Chapter 4, *Environmental Setting, Impacts, Standard Conditions of Approval and Mitigation Measures*. The Draft EIR is available for review by the public at the City of Oakland, Planning Department, Strategic Planning Division-Major Projects, under reference Case Number ER 12-0007, located at 250 Frank H. Ogawa Plaza, Suite 3315, Oakland, California 94612.

A *List of Acronyms and Abbreviations* used in this EIR are provided before Chapter 1.

CHAPTER 2
Summary

2.1 Project Overview

Portfolio Development Partners LLC, the project sponsor, proposes to develop a new, one-story development with 36,000 square feet of high volume retail space and associated parking. The new development would occupy the majority of the project site, which is currently a paved 287-space parking lot open to the public. The project applicant submitted a Basic Application for Development Review to the City of Oakland describing the proposed actions.

This EIR addresses all environmental topics identified in the City of Oakland‘s CEQA Thresholds/Criteria of Significance document, including topics that were found to be less-than-significant.

2.1.1 Site Location

The proposed Project site is a 1.9-acre (83,143 square-feet) lot at 3001-3039 Broadway, at the northeast corner of Broadway and 30th Street in Oakland, California. The project site is also located in the proposed Broadway Valdez Specific Plan (BVDSP) area, for which the City is currently preparing a vision and planning framework for future growth and development in an approximately 95.5-acre area along both sides of Broadway, between Grand Avenue and I-580. The project site is located on the west side of Broadway, approximately 500 feet (approximately four blocks) south of the I-580 overpass.

The General Plan land use designation on the project site is “Community Commercial.” The Project is consistent with the Oakland General Plan land use designation that applies to the project site. The current Zoning classification on the site is “Community Commercial Zone 2” / “Overlay Broadway District” (CC-2/D-BR).

2.1.2 Key Components of the Project

The proposed development would include a 26,000 square-foot retail anchor tenant, Sprouts Farmers Market, and a separate 10,000 square–foot commercial building currently planned to accommodate three retail tenant spaces. All retail areas would be oriented along Broadway and would be primarily accessed through a public plaza connected to the sidewalk along Broadway. Public-realm amenities proposed include landscaping, a public gathering area with café style seating for customers, as well as a plaza and garden seating for customers on the rooftop level.

The Project would provide a total of 162 parking spaces on two parking levels. At ground level, 18 at-grade parking spaces would be provided internal to the building, behind the retail tenant spaces. Rooftop parking includes 144 spaces above grade and will be accessed by two elevators and stairways. A total of 30 short-term bicycle parking spaces (i.e., bicycle racks) would be provided along the Project's Broadway frontage and plaza for customer use. Project employees would use the seven long-term bicycle parking spaces provided near the driveway entrance to the ground-floor parking level.

The grocery's loading dock and trash area would be located internal to the project site and service egress would be onto Broadway, where service vehicles/trucks would be restricted to only turn right to travel southbound on Broadway. Mechanical equipment serving the grocery store and retail spaces would be located on the ground-floor parking level and situated on the roof level and would be screened from public views from ground-level as well as from the rooftop parking deck. The Project does not include a diesel generator.

The Project's landscaping would be concentrated around the perimeter of the site, and a landscaped buffer 10- to 24-feet wide with biofiltration characteristics would be created along the western boundary of the site, between the proposed development and the abutting residential healthcare facility. New street trees would be planted along the street frontages (replacing approximately nine existing right-of-way trees). Also, the Broadway sidewalk would be widened. New lighting on and within the new development would serve functional and aesthetics purposes, and no overhead lighting is proposed.

The project sponsor plans to initiate construction in early 2014, with a target for business to commence in spring 2015. Site preparation and construction activities required for the Project would occur for approximately 12 months.

2.1.3 Public Agency Approvals

This EIR is intended to cover all approvals necessary to implement the Project. These include but are not limited to the following approvals for the proposed Project for which the project applicant has applied or anticipates applying. Each is described in detail in Chapter 3, Project Description, consistent with CEQA Guidelines.

City of Oakland

- Conditional Use Permits (Planning Code Table 17.101C.100)
- Variance (Planning Code Chapter 17.116)
- Design Review (Planning Code Chapter 17.35.020; 17.136.120).
- Encroachment and Construction Permits (Municipal Code 12.08)
- Excavation Permits (Municipal Code 12.12)
- Tentative Parcel Map

Other Agencies

Portions of the Project may require review and approval by a number of other public and quasi-public agencies with jurisdiction over specific aspects of the Project. It is anticipated that these other agencies will rely upon this EIR in their review and decision-making processes. A list of these other agencies and their jurisdictional permits and approvals include the following:

- San Francisco Bay Regional Water Quality Control Board (RWQCB)
- Bay Area Air Quality Management District (BAAQMD)
- East Bay Municipal Utility District (EBMUD)
- Alameda County Flood Control and Water Conservation District (ACFWCD)
- California Department of Toxic Substances Control (DTSC)

2.2 Environmental Impacts and Mitigation Measures

2.2.1 Impacts

All impacts and mitigation measures identified in this EIR are summarized in Table 2-1, Summary of Impacts, Standard Conditions of Approval, Mitigation Measures, and Residual Impacts, at the end of this chapter. Table 2-1 includes all impact statements, standard conditions of approval, recommendations, and the level of significance of the impact after recommended mitigation measures are implemented.

The Project would result in the following significant and unavoidable impacts:

- **Impact GHG-1: The Project would produce greenhouse gas emissions that exceed 1,100 metric tons of CO2e per year and that would exceed 4.6 metric tons of CO2e per service population annually.**

  As discussed in Section 4.6, *Greenhouse Gases and Climate Change*, in Chapter 4 of this EIR, the Project would exceed the quantitative greenhouse gas (GHG) emissions significance thresholds and therefore would implement GHG Standard Condition of Approval (SCA) 1, *Greenhouse Gas Reduction Plan*. All feasible GHG reduction measures have been factored into or considered for the Project, and the purchase of carbon offsets by the project applicant is required to reduce the Project's incremental GHG emissions above 1,100 MT of CO_2e per year (approximately 411 MT CO2e per year) and meet the requirements of GHG SCA 1. Because the ongoing feasibility of this measure to be implemented by the project applicant is cannot be certain in the future (due to the inability to foresee with certainty the future market for and cost of purchasing carbon credits over time), this impact is conservatively considered significant and unavoidable.

- **Impact TRANS-3: The Shops at Broadway Project would increase the v/c ratio for a critical movement by 0.05 or more (Significant Threshold #5) during the weekday PM peak hour and increase the total intersection v/c ratio by 0.03 or more and increase the v/c ratio for a critical movement by 0.05 or more during the Saturday peak hour (Significant Threshold #5) at the 27th Street/24th Street/Bay Place/Harrison Street (#11) intersection, which would operate at LOS F under 2035 conditions.**

2.2.2 Recommendations

Although not required by CEQA, certain Recommendations are included in the environmental analysis that are not necessary to address or mitigate any environmental impacts of the Project, but instead are recommended by City staff to address planning and design issues. These recommendations will be considered by decision-makers during the course of Project review and may be imposed as project-specific Conditions of Approval.

2.3 Alternatives

Chapter 5 presents a detailed analysis of a range of reasonable alternatives to the proposed Project. The alternatives that are analyzed in detail in this Draft EIR are listed below, and Alternative 4 (Fully Mitigated / Grocery Only) is identified as the CEQA-required environmentally superior alternative.

- **No Project** *(No Change to Existing Conditions)*: The Project would not be developed. All existing conditions would continue into the future.
- **1A: Mixed Use 150** *(Residential + Grocery + Local Retail)*: 150 multifamily units above a 28,000 square-foot grocery store and 6,500 square feet of local-serving retail. (Plans of Alternative 1A accompany its detailed description in Section 5.4, below.)
- **1B: Mixed Use 225** *(Residential + Grocery + Local Retail)*: 225 multifamily units above a 26,000 square-foot grocery store and 9,400 square feet of local-serving retail (Plans of Alternative 1B accompany its detailed description in Section 5.4, below.)
- **2: Mixed Use 225/No Grocery** *(Residential + Local Retail)*: 225 multifamily units above 20,000 square feet of local-serving retail.
- **3: Office/Retail** *(Office + Local Retail)*: 100,000 square feet of office use above 10,000 square feet of local-serving retail.
- **4: Fully Mitigated/Grocery Only** *(Grocery)*: 20,000 square-foot grocery store.

2.4 Areas of Concern

Several topics were raised in written comments received in response to the Notice of Preparation (NOP) of this EIR, which are included in Appendix A to this Draft EIR. As appropriate, all topics raised are addressed in this Draft EIR. No issues raised are considered major areas of concern pertaining to CEQA, however, numerous comments were submitted pertaining to the non-CEQA consideration of the desire for a mixed use project at the project site to be in conformance with the Draft BVDSP and other regional planning policies. Two mixed use alternatives (discussed above) are analyzed in this document in response to public comment.

TABLE 2-1
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Aesthetics			
Impact AES-1: The Project would not adversely affect scenic public vistas or views of scenic resources (Criteria 1 and 2). (Less than Significant)	None required		Less than Significant
Impact AES-2: The Project would not substantially degrade the existing visual character or quality of the site and its surroundings (Criterion 3). (Less than Significant)	None required		Less than Significant
Impact AES-3: The Project would result in new sources of light or glare which would not substantially and adversely affect day or nighttime views in the area (Criterion 4). (Less than Significant)	None required	**AES SCA 1:** *Lighting Plan*	Less than Significant
Impact AES-4: The Project, in combination with other past, present, and reasonably foreseeable future projects within and around the project vicinity, would result in less-than-significant cumulative aesthetics effects. (Less than Significant)	None required		Less than Significant
Air Quality			
Impact AIR-1: Construction of the Project would not result in average daily emissions of 54 pounds per day of ROG, NO_X, or $PM_{2.5}$ or 82 pounds per day of PM_{10}. (Criterion 1) (Less than Significant)	None required	**AQ SCA 1:** *Construction-Related Air Pollution Controls (Dust and Equipment Emissions)*	Less than Significant
Impact AIR-2: The Project would not result in operational average daily emissions of more than 54 pounds per day of ROG, NO_X, or $PM_{2.5}$ or 82 pounds per day of PM_{10}; or result in maximum annual emissions of 10 tons per year of ROG, NO_X, or $PM_{2.5}$ or 15 tons per year of PM_{10}. (Criterion 2) (Less than Significant)	None required		Less than Significant
Impact AIR-3: The Project would not contribute to carbon monoxide (CO) concentrations exceeding the California Ambient Air Quality Standards (CAAQS) of nine parts per million (ppm) averaged over eight hours and 20 ppm for one hour. (Criterion 3) (Less than Significant)	None required		Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Air Quality (continued)			
Impact AIR-4: The Project would not expose persons to substantial levels of Toxic Air Contaminants (TACs) resulting in (a) a cancer risk level greater than 10 in one million, (b) a non-cancer risk (chronic or acute) hazard index greater than 1.0, or (c) an increase of annual average $PM_{2.5}$ of greater than 0.3 micrograms per cubic meter by siting a new source or a new sensitive receptor. (Criterion 4) (Less than Significant)	None required		Less than Significant
Impact AIR-5: The Project would not frequently and for a substantial duration, create or expose sensitive receptors to substantial objectionable odors affecting a substantial number of people. (Criterion 5) (Less than Significant)	None required		Less than Significant
Impact AIR-6: The Project would not expose persons, by siting a new source or a new sensitive receptor, to substantial levels of TACs resulting in (a) a cumulative cancer risk level greater than 100 in a million, (b) a cumulative non-cancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 micrograms per cubic meter. (Criterion 6) (Less than Significant)	None required	**AQ SCA 1:** *Construction-Related Air Pollution Controls (Dust and Equipment Emissions)*	Less than Significant
Biological Resources			
Impact BIO-1: The Project could fundamentally conflict with the City of Oakland Tree Protection Ordinance (Oakland Municipal Code Chapter 12.36) by removal of protected trees under certain circumstances (Criterion 6). (Less than Significant)	None required	**BIO SCA 3:** *Tree Replacement Plantings*	Less than Significant
Impact BIO-2: Construction activity and operations of the Project, in combination with past, present, existing, approved, pending and reasonably foreseeable future projects in the project vicinity, would not result in impacts on special-status species, sensitive habitats, wildlife movement corridors, wetlands, and other waters of the U.S. (Less than Significant)		**BIO SCA 1:** *Tree Removal During Breeding Season*; **BIO SCA 2:** *Tree Removal Permit*; and **BIO SCA 3:** *Tree Replacement Plantings*	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Cultural and Paleontological Resources			
Impact CUL-1: The Project would not result in the physical demolition, destruction, relocation, or alteration of historical resources that are listed in or may be eligible for listing in the federal, state, or local registers of historical resources (Criterion 1). (Less than Significant)	None required	**CUL SCA 4:** *Vibrations to Adjacent Historic Structures*	Less than Significant
Impact CUL-2: The Project could result in significant impacts to unknown archaeological resources (Criterion 2). (Less than Significant)	None required	**CUL SCA 1:** *Archaeological Resources*	Less than Significant
Impact CUL-3: The Project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (Criterion 3). (Less than Significant)	None required	**CUL SCA 3:** *Paleontological Resources*	Less than Significant
Impact CUL-4: The Project could disturb human remains, including those interred outside of formal cemeteries (Criterion 4). (Less than Significant)	None required	**CUL SCA 2:** *Human Remains;* and **CUL SCA 3:** *Paleontological Resources*	Less than Significant
Impact CUL-5: The Project, combined with cumulative development in the project vicinity and citywide, including past, present, existing, approved, pending, and reasonably foreseeable future development within and around the Project, would not result in a significant adverse impact to cultural resources. (Less than Significant)	None required	**CUL SCA 1:** *Archaeological Resources*; **CUL SCA 2:** *Human Remains*; **CUL SCA 3:** *Paleontological Resources;* and **CUL SCA 4:** *Vibrations Adjacent to Historic Structures*	Less than Significant
Geology, Soils, and Seismicity			
Impact GEO-1: The Project could expose people or structures to seismic hazards such as ground shaking and seismic-related ground failure such as liquefaction, differential settlement, collapse, or lateral spread (Criteria 1 through 4). (Less than Significant)	None required	**GEO SCA 3:** *Geotechnical Report*	Less than Significant
Impact GEO-2: The Project could be subjected to geologic hazards, including expansive soils, subsidence, seismically-induced settlement and differential settlement (Criterion 7). (Less than Significant)	None required	**GEO SCA 2:** *Soils Report;* and **GEO SCA 3:** *Geotechnical Report*	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Geology, Soils, and Seismicity (cont.)			
Impact GEO-3: The Project, when combined with other past, present, existing, approved, pending and reasonably foreseeable development in the vicinity, would not result in significant cumulative impacts with respect to geology, soils or seismicity. (Less than Significant)	None required	**GEO SCA 1:** *Erosion and Sedimentation Control Plan;* **GEO SCA 2:** *Soils Report;* and **GEO SCA 3:** *Geotechnical Report*	Less than Significant
Greenhouse Gases and Climate Change			
Impact GHG-1: The Project would produce greenhouse gas emissions that exceed 1,100 metric tons of CO_{2e} per year, and that would exceed 4.6 metric tons of CO_2e per service population annually (Criterion 1). (Significant and Unavoidable)	None feasible	**GHG SCA 1:** *GHG Reduction Plan;* **GHG SCA 2:** *Green Building for Residential Structures and Non-residential Structures;* **GHG SCA 3:** *Green Building for Building and Landscape Projects;* **TRANS SCA 1:** *Parking and Transportation Demand Management;* **UTIL SCA 1:** *Waste Reduction and Recycling;* **AES SCA 1:** *Lighting Plan*; **BIO SCA 3:** *Tree Replacement Plantings*; **GEO SCA 1:** *Erosion and Sedimentation Control Plan*; and **HYD SCA 1:** *Stormwater Pollution Prevention Plan (SWPPP)*	Conservatively Significant and Unavoidable
Impact GHG-2: The Project would not conflict with an applicable plan, policy or regulation of an appropriate regulatory agency adopted for the purpose of reducing greenhouse gas emissions (Criterion 2). (Less than Significant)	None required	**GHG SCA 1:** *GHG Reduction Plan;* **AQ SCA 1:** *Construction-Related Air Pollution Controls (Dust and Equipment Emissions);* **HAZ SCA 2:** *Asbestos Removal in Structures;* **GEO SCA 1:** *Erosion and Sedimentation Control Plan*; **HYD SCA 1:** *Stormwater Pollution Prevention Plan (SWPPP)*; **AES SCA 1:** *Lighting Plan*; **BIO SCA 2:** *Tree Removal Permit*; and **UTIL SCA 1:** *Waste Reduction and Recycling*	Less than Significant
Hazards and Hazardous Materials			
Impact HAZ-1: The Project would result in an increase in the routine transportation, use, and storage of hazardous chemicals, however, no significant public hazard would result (Criteria 1 and 3). (Less than Significant)	None required	**HAZ SCA 1:** *Hazards Best Management Practices*	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Hazards and Hazardous Materials (cont.)			
Impact HAZ-2: The Project dould result in the accidental release of hazardous materials used during construction through improper handling or storage, however, compliance with regulatory requirements will ensure no significant public hazard would result (Criterion 2). (Less than Significant)	None required	**HAZ SCA 1:** *Hazards Best Management Practices;* **HAZ SCA 5:** *Lead-Based Paint/Coatings, Asbestos, or PCB Occurrence Assessment;* **HAZ SCA 6:** *Environmental Site Assessment Reports Remediation*; and **HAZ SCA 9:** *Health and Safety Plan per Assessment*	Less than Significant
Impact HAZ-3: The Project could result in the exposure of hazardous materials in soil and ground water, however, compliance with regulatory requirements will ensure no significant public hazard would result (Criteria 2 and 5). (Less than Significant)	None required	**HAZ SCA 1:** *Hazards Best Management Practices;* **HAZ SCA 5**: *Lead-Based Paint/Coatings, Asbestos, or PCB Occurrence Assessment;* **HAZ SCA 6:** *Environmental Site Assessment Reports Remediation*; **HAZ SCA 9:** *Health and Safety Plan per Assessment;* and **HAZ SCA 10***: Radon or Vapor Intrusion.*	Less than Significant
Impact HAZ-4: The Project could result in the exposure of hazardous building materials during building demolition, however, compliance with regulatory requirements will ensure no significant public hazard would result (Criterion 2). (Less than Significant)	None required	**HAZ SCA 7:** *Lead-base Paint Remediation*, and **HAZ SCA 2:** *Asbestos Removal in Structures*	Less than Significant
Impact HAZ-5: The Project would require use of hazardous materials within 0.25 mile of a school, however, compliance with regulatory requirements will ensure that no significant public hazard would result (Criteria 3 and 4). (Less than Significant)	None required	**HAZ SCA 11:** *Hazardous Materials Business Plan*	Less than Significant
Impact HAZ-6: The Project would not result in fewer than two emergency access routes for streets exceeding 600 feet in length and would not physically interfere with an adopted emergency response plan or emergency evacuation plan (Criteria 6 and 9). (Less than Significant)	None required		Less than Significant
Impact HAZ-7: The Project, when combined with other past, present, existing, approved, pending and reasonably foreseeable development in the vicinity, would not result in significant cumulative hazards. (Less than Significant)	None required	**HAZ SCA 8:** *Other Materials Classified as Hazardous Waste;* **HAZ SCA 12:** *Hazardous Materials Business Plan; and* **HAZ SCA 3:** *Site Review by Fire Services Division*	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Hydrology and Water Quality			
Impact HYD-1: The Project could alter drainage patterns and increase the volume of stormwater, or the level of contamination or siltation in stormwater flowing from the project site, however, compliance with applicable regulatory requirements will ensure that no significant impacts would result (Criteria 1, 3 through 7, and 12). (Less than Significant)	None required	**HYD SCA 1:** *Stormwater Pollution Prevention Plan;* **HYD SCA 2:** *Post-construction Stormwater Pollution Management Plan;* **HYD SCA 3:** *Maintenance Agreement for Stormwater Treatment Measures*; and **UTIL SCA 2***: Stormwater and Sewer*	Less than Significant
Impact HYD-2: The Project could be susceptible to flooding hazards in the event of dam or reservoir failure (Criteria 10 and 11). (Less than Significant)	None required		Less than Significant
Impact HYD-3: The Project would not be susceptible to inundation in the event of sea-level rise (Criterion 11). (Less than Significant)	None required		Less than Significant
Impact HYD-4: The Project would not adversely affect the availability of groundwater supplies or interfere substantially with groundwater recharge (Criterion 2) (Less than Significant)	None required		Less than Significant
Impact HYD-5: The Project would not be susceptible to mudflow, seiche, and tsunami-related hazards (Criterion 11). (Less than Significant)	None required		Less than Significant
Impact HYD-6: The Project, combined with past, present, existing, approved, pending, and reasonably foreseeable future projects would not result in potentially significant cumulative impacts to hydrologic resources. (Less than Significant)	None required		Less than Significant
Land Use, Plans, and Policies			
Impact LU-1: The Project would not result in the physical division of an existing community or conflict with adjacent or nearby land uses (Criteria 1 and 2). (Less than Significant)	None required		Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Land Use, Plans, and Policies (cont.)			
Impact LU-2: The Project would not conflict with applicable land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect (Criterion 3). (Less than Significant)	None required		Less than Significant
Impact LU-3: The Project would not fundamentally conflict with any applicable habitat conservation plan or natural community conservation plan (Criterion 4). (Less than Significant)	None required		Less than Significant
Impact LU-4: The Project, combined with cumulative development in the defined geographic area, including past, present, existing, approved, pending, and reasonably foreseeable future development, does not result in any significant adverse cumulative impacts in the area. (Less than Significant)			Less than Significant
Noise and Vibration			
Impact NOI-1: The Project would not result in substantial temporary or periodic increases in ambient noise levels in the project area above existing levels without the Project and in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (Criteria 1, 2 and 8). (Less than Significant)	None required	**NOI SCA 1:** *Days/Hours of Construction Operation*; **NOI SCA 2:** *Noise Control;* **NOI SCA 3:** *Noise Complaint Procedures*; **NOI SCA 6**: *Vibration;* and **NOI 7:** *Pile Driving and Other Extreme Noise Generators*	Less than Significant
		Implementation of NOI SCA 2: *Noise Control:* 1. **Temporary Noise Barrier:** During all construction activities, a temporary noise barrier of approximately 385 feet in length shall be located along or near the west property line of the project site, as shown generally in **Figure 4.10-3**. The noise barrier shall require a maximum 10-foot return on each end and be oriented 45 degrees into the construction site. *a.* *<u>Construction Site</u>* (i) The temporary noise barrier could be constructed of a sound blanket system hung on scaffolding to achieve a minimum height (described below) and to allow the	

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Noise and Vibration (cont.)			
Impact NOI-1 (cont.)		system to be moved or adjusted if necessary to allow construction activity immediately adjacent to the west property line. (ii) An alternative temporary noise barrier design could consist of plywood installed on top of a portable concrete K-Rail system which also allows the ability to move or adjust the wall location. The minimum height of the temporary noise barrier design "i" or "ii" situated on the project site would range from at least 16 feet tall near the south property line (30th Street end) to 10 feet tall near the north property line, to maintain at least 6 feet of the barrier above the existing retaining wall (which is approximately 10 feet tall at the south property line and four feet tall at the north property line). This minimum height is prescribed to block the line of sight between the receptor property and the construction site for maximum effectiveness. *b. Receptor Site* (i) As an alternative to an on-site temporary noise barrier (described above in "a" and "b"), the applicant shall coordinate with the owner/operator of the adjacent Oakland Healthcare and Wellness Center property and evaluate the feasibility of locating a temporary noise barrier design on the receptor property, specifically along the elevated walkway between the residential units and the shared property line. This approach would allow a 6-foot-tall barrier on top of the elevated walkway to block the line of	

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Noise and Vibration (cont.)			
Impact NOI-1 (cont.)		sight between the receptor property and the construction site, but would also require a 10-foot long return on each end of the barrier on the construction site, if feasible in a manner that improves the effective noise reduction. (iii) **Effectiveness Monitoring.** The applicant shall monitor the effectiveness of the implemented temporary noise barrier design by taking noise measurements during each construction phase (excavation, foundations, erection, interior and exterior finishing). Implementation of the temporary noise barrier designs described in #1 are estimated to achieve noise level reduction of approximately 5 dBA from the construction noise levels at the adjacent receptor, where levels are estimated to be as high as 96.5 dBA at the west property line. Up to 5 dBA is considered the maximum feasible noise attenuation that would be achieved with installation of a temporary noise barrier, and some additional level of additional reduction would be achieved with adherence to NOI SCA 2. The applicant shall submit the recorded noise measurements to the Planning and Zoning Division and the Building Services Division.	
Impact NOI-2: The Project would not increase operational noise levels in the project area to levels in excess of standards established in the Oakland Noise Ordinance and Planning Code (Criterion 3)**.** (Less than Significant)	None required	**NOI SCA 4:** *Interior Noise;* and **NOI SCA 5:** *Operational Noise (General)*	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Noise and Vibration (cont.)			
Impact NOI-2 (cont.)	**Recommendation NOI-1**: Acoustical louvers could be installed in these ventilation openings on the west elevation of the ground-level of the garage to reduce the transmission of garage sounds.		Less than Significant
	Recommendation NOI-2: To reduce the noise levels within the garage and further reduce noise emanating from the garage, the underside of the garage ceiling could be fully lined with spray-on thermal/acoustic insulation, and sound-absorptive material could be applied to the ramp walls.		
	Recommendation NOI-3: Potential tire noise could be reduced by avoiding a polished (squeaky) concrete slab surface.		
	Recommendation NOI-4: Power washing of shopping carts should occur within the enclosed loading dock area, or at the far end of the service deck, away from residential neighbors.		
Impact NOI-3: The Project would not expose persons to exterior noise levels in conflict with the land use compatibility guidelines of the Oakland General Plan after incorporation of all applicable Standard Conditions of Approval (Criterion 6). (Less than Significant)	None required	**NOI SCA 4:** *Interior Noise*	Less than Significant
Impact NOI-4: The Project would not expose persons to interior Ldn or CNEL greater than 45 dBA for multi-family dwellings, hotels, motels, dormitories and long-term care facilities to noise levels in excess of standards established in the Oakland Noise Ordinance and Planning Code (Criterion 5). (Less than Significant)	None required		Less than Significant
Impact NOI-5: Traffic generated by Project could substantially increase traffic noise levels in the project area (Criterion 4). (Less than Significant)	None required		Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Noise and Vibration (cont.)			
Impact NOI-6: Traffic generated by the Project, in combination with traffic from past, present, existing, approved, pending and reasonably foreseeable future projects, could substantially increase traffic noise levels in the project area; and construction and operational noise levels in combination with traffic from past, present, existing, approved, pending and reasonably foreseeable future projects, could increase ambient noise levels (Criterion 4). (Less than Significant)	None required	**NOI SCA 1:** *Days/Hours of Construction Operation*; **NOI SCA 2:** *Noise Control;* and **NOI SCA 3:** *Noise Complaint Procedures*; **NOI SCA 4:** *Interior Noise;* and **NOI SCA 5:** *Operational Noise (General)*; **NOI SCA 6**: *Vibration;* **NOI SCA 7:** *Pile Driving and Other Extreme Noise Generators.*	Less than Significant
Impact NOI-7: Stationary noise sources such as rooftop mechanical equipment in combination with traffic generated by the Project; and from past, present, existing, approved, pending and reasonably foreseeable future projects; could substantially increase noise levels at sensitive land uses in the project area; (Criterion 4). (Less than Significant)	None required	**NOI SCA 4:** *Interior Noise;* and **NOI SCA 5:** *Operational Noise (General)*	Less than Significant
Population, Housing, and Employment			
Impact POP-1: The Project would not induce substantial population growth in a manner not contemplated in the General Plan, either directly or indirectly (Criterion 1). (Less than Significant)	None required		Less than Significant
Public Services and Recreation			
Impact PSR-1: The Project could result in an increase in calls for police services, but would not require new or physically altered police facilities in order to maintain acceptable performance objectives (Criterion 1). (Less than Significant)	None required		Less than Significant
Impact PSR-2: The Project could result in an increase in calls for fire protection and emergency medical response services, but would not require new or physically altered fire protection facilities in order to maintain acceptable performance objectives (Criterion 1). (Less than Significant)	None required	**PSR SCA 2:** *Fire Safety Phasing Plan*	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Public Services and Recreation (cont.)			
Impact PSR-3: The Project, in combination with other past, present, existing, approved, pending, and reasonably foreseeable future projects within and around the project site, would not result in a cumulative increase in demand for police, fire, and school services. (Less than Significant)	None required		Less than Significant
Impact PSR-4: The Project could result in new students for local schools, but would not require new or physically altered school facilities to maintain acceptable performance objectives (Criterion 1). (Less than Significant)	None required		Less than Significant
Recreation			
Impact REC-1: The Project could increase the use of existing neighborhood or regional parks or other recreational facilities, but not such that substantial physical deterioration of the facility would occur or be accelerated, or cause the need for new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios (Recreation Criterion 1 and Public Services Criterion 1). (Less than Significant)	None required		Less than Significant
Transportation and Circulation			
Impact TRANS-1: The Project would increase the V/C ratio for a critical movement by 0.05 or more (Significant Threshold #5) during the weekday PM peak hour at the *Piedmont Avenue/Hawthorne Avenue/Brook Street/Broadway* intersection (#6), which would operate at LOS F under 2035 conditions. (Significant)	**Mitigation Measure TRANS-1:** Implement the following measures at the Piedmont Avenue/ Hawthorne Avenue/Brook Street/Broadway intersection: • Optimize signal timing (i.e., changing the amount of green time assigned to each lane of traffic approaching the intersection). • Coordinate the signal timing changes at this intersection with the adjacent intersections that are in the same signal coordination group. To implement this measure, the project sponsor shall submit the following to City of Oakland's Transportation Services Division for review and approval:		Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Transportation and Circulation (cont.)			
Impact TRANS-1 (cont.)	• Plans, Specifications, and Estimates (PS&E) to modify intersection. All elements shall be designed to City standards in effect at the time of construction and all new or upgraded signals should include these enhancements. All other facilities supporting vehicle travel and alternative modes through the intersection should be brought up to both City standards and Americans with Disabilities Act (ADA) standards (according to Federal and State Access Board guidelines) at the time of construction. Current City Standards call for the elements listed below: – 2070L Type Controller with cabinet assembly – GPS communications (clock) – Accessible pedestrian crosswalks according to Federal and State Access Board guidelines with signals (audible and tactile) – Countdown pedestrian head module switch out – City standard ADA wheelchair ramps – Video detection on existing equipment (or new, if required) – Mast arm poles, full actuation (where applicable) – Polara push buttons (full actuation) – Bicycle detection (full actuation) – Pull boxes – Signal interconnect and communication with trenching (where applicable), or through (E) conduit (where applicable)- 600 feet maximum – Conduit replacement contingency – Fiber Switch – PTZ Camera (where applicable)		

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Transportation and Circulation (cont.)			
Impact TRANS-1 (cont.)	– Transit Signal Priority (TSP) equipment consistent with other signals along corridor • Signal timing plans for the signals in the coordination group. The project sponsor shall fund the cost of preparing and implementing these plans. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, the Project Sponsor shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall mitigate this impact to less than significant. A straight line interpolation of intersection traffic volume between Existing and 2035 Plus Project conditions indicates that mitigation at this intersection may be required by 2034. Investigation of the need for this mitigation shall be studied at that time and every three years thereafter until 2035 or until the mitigation measure is implemented, whichever occurs first. After implementation of this measure, the intersection would continue to operate at LOS F during the weekday PM peak hour. However, the mitigation measure would reduce the v/c ratio for the critical movements and mitigate the impact. No secondary impacts would result from implementation of this measure.		
Impact TRANS-2: The Project would increase the total intersection v/c ratio by 0.03 or more and increase the V/C ratio for a critical movement by 0.05 or more during the weekday PM peak hour (Significant Threshold #5) at the *27th Street/Broadway* intersection (#10), which would operate at LOS F under 2035 conditions. (Significant)	**Mitigation Measure TRANS-2**: Implement the following measures at the 27th Street/Broadway intersection: • Upgrade traffic signal operations at the intersection to actuated-coordinated operations • Provide protected left-turn phase(s) for the southbound approach.		Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Transportation and Circulation (cont.)			
Impact TRANS-2 (cont.)	• Optimize signal timing (i.e., changing the amount of green time assigned to each lane of traffic approaching the intersection). • Coordinate the signal timing changes at this intersection with the adjacent intersections that are in the same signal coordination group. To implement this measure, the project sponsor shall submit the following to City of Oakland's Transportation Services Division for review and approval: • PS&E to modify intersection as detailed in Mitigation Measure TRANS-1. • Signal timing plans for the signals in the coordination group. The project sponsor shall fund the cost of preparing and implementing these plans. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, the Project Sponsor shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall mitigate this impact to less than significant. A straight line interpolation of intersection traffic volume between Existing and 2035 Plus Project conditions indicates that mitigation at this intersection may be required by 2033. Investigation of the need for this mitigation shall be studied at that time and in 2035 or until the mitigation measure is implemented, whichever occurs first. After implementation of this measure, the intersection would continue to operate at LOS F during the weekday PM peak hour. However, the mitigation measure would reduce the v/c ratio for the intersection and critical movements and mitigate the impact. No secondary impacts would result from implementation of this measure.		

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Transportation and Circulation (cont.)			
Impact TRANS-3: The Project would increase the v/c ratio for a critical movement by 0.05 or more (Significant Threshold #5) during the weekday PM peak hour and increase the total intersection V/C ratio by 0.03 or more and increase the V/C ratio for a critical movement by 0.05 or more during the Saturday peak hour (Significant Threshold #5) at the *27th Street/24th Street/Bay Place/Harrison Street intersection* (#11), which would operate at LOS F under 2035 conditions. (Significant and Unavoidable)	**Mitigation Measure TRANS-3:** Implement the following measures at the 27th Street/ 24th Street/Bay Place/Harrison Street intersection: • Reconfigure the 24th Street approach at the intersection to restrict access to 24th Street to right turns only from 27th Street and create a pedestrian plaza at the intersection approach. • Convert 24th Street between Valdez and Harrison Streets to two-way circulation and allow right turns from 24th Street to southbound Harrison Street south of the intersection, which would require acquisition of private property in the southwest corner of the intersection. • Modify eastbound 27th Street approach from the current configuration (one right-turn lane, two through lanes, and one left-turn lane) to provide one right-turn lane, one through lane, and two left-turn lanes. • Realign pedestrian crosswalks to shorten pedestrian crossing distances. • Reduce signal cycle length from 160 to 120 seconds, and optimize signal timing (i.e., changing the amount of green time assigned to each lane of traffic approaching the intersection). • Coordinate the signal timing changes at this intersection with the adjacent intersections that are in the same signal coordination group. To implement this measure, the project sponsor shall submit the following to City of Oakland's Transportation Services Division for review and approval: • PS&E to modify intersection as detailed in Mitigation Measure TRANS-1. • Signal timing plans for the signals in the coordination group.		Significant and Unavoidable

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Transportation and Circulation (cont.)			
Impact TRANS-3 (cont.)	The project sponsor shall fund the cost of preparing and implementing these plans. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, the Project Sponsor shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall be considered the equivalent of implementing the mitigation measure, which would still result in significant unavoidable impacts. A straight line interpolation of intersection traffic volume between Existing and 2035 Plus Project conditions indicates that mitigation at this intersection may be required by 2033. Investigation of the need for this mitigation shall be studied at that time and in 2035 or until the mitigation measure is implemented, whichever occurs first. After implementation of this measure, the intersection would continue to operate at LOS F during the weekday PM peak hour and improve to LOS D during the Saturday peak hour. Although the mitigation measure would reduce the total intersection v/c ratio during the weekday PM peak hour, it would not reduce the v/c ratio for critical movements to 0.05 or less. Therefore, the impact would remain significant and unavoidable. No other feasible mitigation measures are available that would mitigate the project impacts at the 27th Street/24th Street/Bay Place/Harrison Street intersection. Traffic operations at the intersection can be further improved by providing additional automobile travel lanes, such as a third lane on northbound or southbound Harrison Street, or a second through lane on eastbound 27th Street. However, these modifications cannot be accommodated within the existing automobile right-of-way and would require additional right-of-way, and/or loss of existing bicycle lanes,		

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Impact TRANS-3 (cont.)	medians and/or on-street parking, and are considered to be infeasible. Therefore, the impact is considered significant and unavoidable. This mitigation measure would also reduce pedestrian delays at the intersection and improve pedestrian safety by realigning the crosswalks at the intersection and reducing pedestrian crossing distances. No other secondary impacts would result from implementation of this measure.		
Impact TRANS-4: The Project would increase the total intersection v/c ratio by 0.03 or more and increase the v/c ratio for a critical movement by 0.05 or more during the weekday PM peak hour (Significant Threshold #5) at the *Grand Avenue/ Broadway* intersection (#12), which would operate at LOS F under 2035 conditions. (Significant)	**Mitigation Measure TRANS-4:** Implement the following measures at the Grand Avenue/ Broadway intersection: • Provide permitted-protected left-turn phasing for the northbound approach. • Optimize signal timing (i.e., changing the amount of green time assigned to each lane of traffic approaching the intersection). • Coordinate the signal timing changes at this intersection with the adjacent intersections that are in the same signal coordination group. To implement this measure, the project sponsor shall submit the following to City of Oakland's Transportation Services Division for review and approval: • PS&E to modify intersection as detailed in Mitigation Measure TRANS-1. • Signal timing plans for the signals in the coordination group. • The project sponsor shall fund the cost of preparing and implementing these plans. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, the Project Sponsor shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall mitigate this impact to less than significant. A straight line interpolation of intersection traffic volume	**TRANS SCA 1:** *Parking and Transportation Demand Management*; and **TRANS SCA 2:** *Construction Traffic and Parking*	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Transportation and Circulation (cont.)			
Impact TRANS-4 (cont.)	between Existing and 2035 Plus Project conditions indicates that mitigation at this intersection may be required by 2034. Investigation of the need for this mitigation shall be studied at that time and in 2035 or until the mitigation measure is implemented, whichever occurs first. After implementation of this measure, the intersection would continue to operate at LOS F during the weekday PM peak hour. However, the mitigation measure would reduce the v/c ratio for the intersection and critical movements and mitigate the impact. No secondary impacts would result from implementation of this measure.		
	Recommendation TRANS-5: Implement the following measures: • Provide the following at the signalized 30th Street/Broadway intersection: - Pedestrian signal heads with count-down signals at the four crosswalks at the intersection; however, if the existing signal equipment cannot accommodate new pedestrian signal heads, replace the existing signal equipment necessary to include these facilities; - Directional curb ramps at all four corners of the intersection aligning with the crosswalks, avoiding, or relocating if necessary, the existing signal poles. - Consider providing Leading Pedestrian Intervals for the pedestrian crossings at this intersection. - Coordinate these improvements at 30th Street/Broadway intersection with AC Transit and Recommendation TRANS-6. • Provide the following at the unsignalized midblock crossing on Broadway just north of the project site:		

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Transportation and Circulation (cont.)			
Impact TRANS-4 (cont.)	- Bulbouts on both sides of the crossing - Rectangular Rapid Flash Beacons (RRFB) for both directions of Broadway		
	Recommendation TRANS-6: Coordinate with AC Transit to implement the following, which are consistent with the draft improvements for Route 51 TPI: • Move the southbound Route 51A bus stop from just north of 30th Street to just south of 30th Street, and provide a bulbout at the bus stop and amenities such as a shelter and bench. • Move the northbound Route 51A bus stop from just north of 29th Street to just north of 30th Street, extend the existing bulbout to accommodate buses, and provide amenities such as a shelter and bench.		
	Recommendation TRANS-7: Although not required to address an adverse environmental impact, the following should be considered in regards to bicycle parking: • Ensure that short-term and long-term bicycle parking spaces are consistent with *City of Oakland Bicycle Parking Rack Guidelines*. • Ensure the short-term bicycle parking on sidewalks do not block pedestrian circulation. • Ensure that some short-term bicycle parking spaces can accommodate bicycles with trailers. • Monitor the usage of long-term and short-term bicycle parking spaces and if necessary provide additional parking spaces.		

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Transportation and Circulation (cont.)			
Impact TRANS-4 (cont.)	**Recommendation TRANS-8:** Although not required to address an adverse environmental impact, the following strategies, to further implement SCA 25, should be considered to reduce project parking demand and better manage the available parking supply: • Limit parking on the ground level to ADA accessible spaces and short-term (20 minutes or less) parking. • Limit most parking spaces on the roof-level to two hours or less so that they are available to project visitors and not used for commuter parking. • Encourage employees to park on the roof-level furthest away from the elevators and in the compact parking spaces. • Provide signage informing motorists in the ground level parking that additional parking is available on the roof-top. • Install parking meters at all on-street parking spaces along the project frontage on Broadway and 30th Street and limit parking to one-hour or less.		
	Recommendation TRANS-9: Implement the following measures to minimize queues on the eastbound 30th Street approach at the 30th Street/Broadway intersection: • Adjust signal timing parameters at the intersection to provide more green time for the east/west movements. • Consider providing a right-turn lane on eastbound 30th Street at Broadway. This may require elimination of one or more on-street parking spaces on 30th Street.		

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS, MITIGATION MEASURES, STANDARD CONDITIONS OF APPROVAL AND RESIDUAL EFFECTS

Environmental Impact	Mitigation Measures and Recommendations	Standard Condition of Approval	Level of Significance after application of Mitigation and SCA
Utilities and Service Systems			
Impact UTIL-1: The water demand generated by the Project would not exceed water supplies available from existing entitlements and resources (Criterion 3). (Less than Significant)	None required		Less than Significant
Impact UTIL-2: The Project would not exceed the wastewater treatment requirements of the San Francisco Regional Water Quality Control Board or result in a determination that new or expanded wastewater treatment facilities would be required (Criteria 1 and 4). (Less than Significant)	None required	**UTIL SCA 2:** *Stormwater and Sewer*	Less than Significant
Impact UTIL-3: The Project would not require or result in construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects (Criteria 2). (Less than Significant)	None required	**UTIL SCA 2:** *Stormwater and Sewer;* **HYD SCA 2:** *Post-construction Stormwater Pollution Prevention Plan; and* **HYD SCA 1:** *Stormwater Pollution Prevention Plan*	Less than Significant
Impact UTIL-4: The Project would not violate applicable federal, state, and local statutes and regulations related to solid waste; nor generate solid waste that would exceed the permitted capacity of the landfills serving the area (Criteria 5 and 6). (Less than Significant)	None required	**UTIL SCA 1:** *Waste Reduction and Recycling*	Less than Significant
Impact UTIL-5: The Project would not violate applicable federal, state and local statutes and regulations relating to energy standards; nor result in a determination by the energy provider which serves or may serve the area that it does not have adequate capacity to serve projected demand in addition to the providers' existing commitments and require or result in construction of new energy facilities or expansion of existing facilities (Criteria 7 and 8). (Less than Significant)	None required	**UTIL SCA 3:** *Compliance with the Green Building Ordinance,* and **UTIL SCA 4:** *Compliance with the Green Building Ordinance for Building and Landscape Projects*	Less than Significant
Impact UTIL-6: The Project in combination with other past, present, existing, approved, pending, and reasonably foreseeable future projects within and around the Project would result in an increased demand for utilities services. (Less than Significant)	None required	**UTIL SCA 1:** *Waste Reduction and Recycling*, **UTIL SCA 2:** *Stormwater and Sewer*; **HYD SCA 1:** *Stormwater Pollution Prevention Plan*; and **HYD SCA 2:** *Post-construction Stormwater Management Plan*	Less than Significant

CHAPTER 3
Project Description

3.1 Project Location and Site Characteristics

3.1.1 Project Location and Access

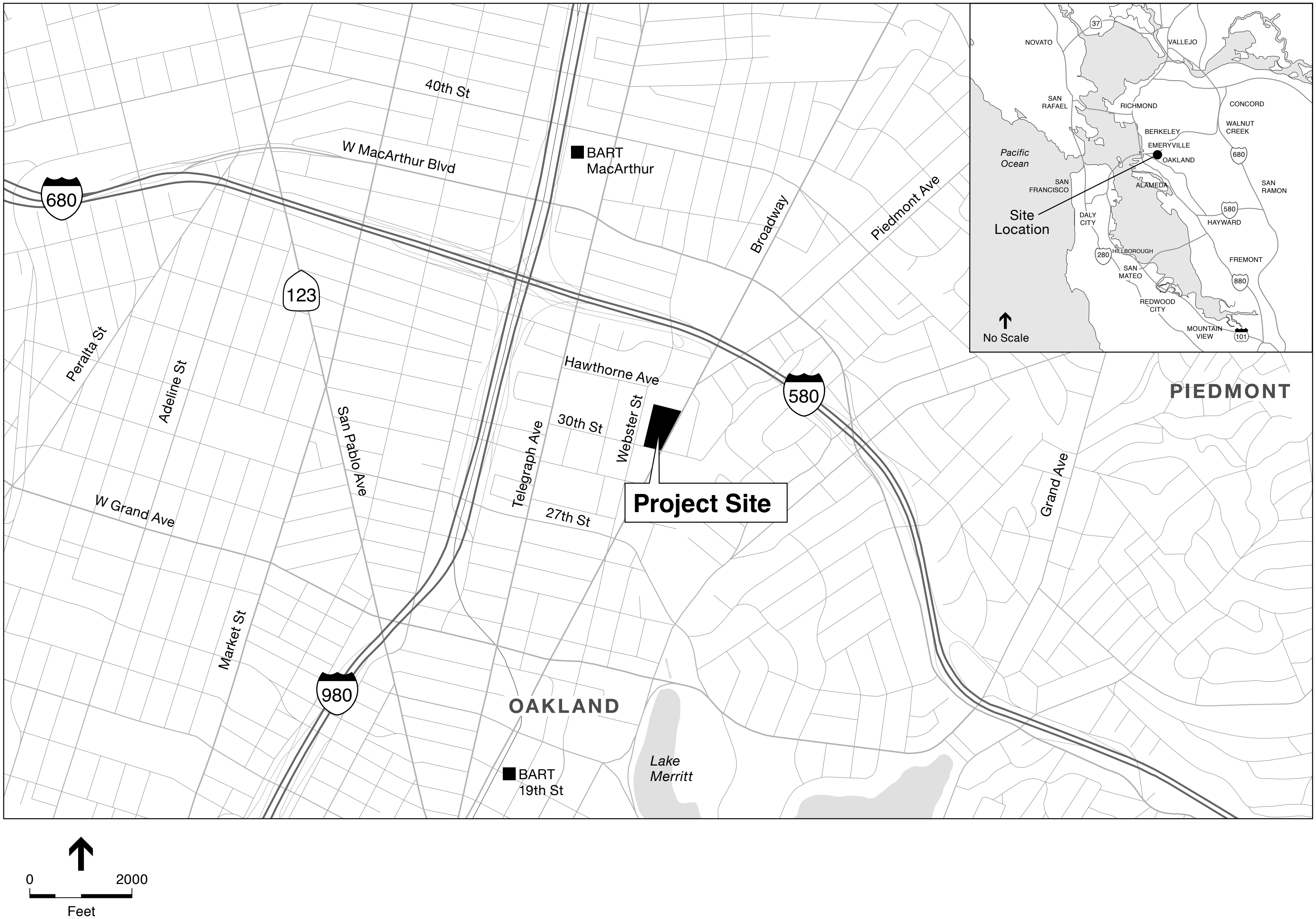
The proposed project site is a 1.9-acre (83,143 square-feet) lot at 3001-3039 Broadway, at the northwest corner of Broadway and 30th Street in Oakland, California. The project site is located approximately one mile north of Downtown Oakland and three miles east of the San Francisco Bay, as shown in **Figure 3-1, Project Location Map**. As shown in Figure 3-1, the project site situated along Broadway– the major north-south arterial that runs the length from downtown to the Berkeley Hills – and 30th Street, which is a key connector street that runs east-west between Broadway and Telegraph Avenue. The subject site is located at the base of "Pill Hill" where the 15-acre Alta Bates Summit Medical Center (ABSMC) is located. Regional freeway access to the project site is provided by Interstates 580 (I-580) and 980 (I-980).

The project site is also located in the proposed Broadway Valdez Specific Plan (BVDSP) area, for which the City is currently preparing a vision and planning framework for future growth and development in an approximately 95.5-acre area along both sides of Broadway, between Grand Avenue and I-580. The project site is located on the west side of Broadway, approximately 500 feet (approximately four blocks) south of the I-580 overpass.

3.1.2 Existing Project Site Characteristics

Existing and Previous Uses

The project site is currently a 287-space parking lot open to the public. The lot is paved with asphalt and striped to accommodate automobiles and light trucks. As indicated during the public scoping period for this EIR in August 2012, the City's staff report indicated that the parking lot was used by ABSMC, which in late 2012 completed and moved into its new parking structure at Hawthorne Avenue and Elm Street. Light posts are located in the center area of the site and along the 30th Street and Broadway boundaries. Also located on the site is a "Connell Used Cars" sign mounted on two tall posts along the Broadway frontage. There is also a small concrete pad where a small automobile sales building previously existed. **Figure 3-2**, **Site Plan and Surrounding Context**, is an aerial photograph showing the project site and its surroundings. Keyed photographs showing more of the surrounding context are provided in Figures 4.1-1through 4.1-5 in Section 4.1, *Aesthetics*, of this EIR.)



SOURCE: ESA

The Shops at Broadway Retail Project

Figure 3-1

Project Location Map

SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 3-2

Site Plan and Surrounding Context

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The site is relatively flat, but slopes upward slightly to the west, toward “Pill Hill.” Primary access to the site is currently provided via a paved driveway on 30th Street, where there is currently a small shelter. Additional site access is provided through an adjoining paved automobile sales lot to the north. A chain-link-fence exists along the street frontages and the northern boundary of the site, and a low, decorative chain-post barrier edges the street-facing frontages. Although mostly blocked by the existing fencing, there are a total of seven curb cuts to the site from Broadway, and one additional curb cut from 30th Street. Public sidewalks also edge the street frontages.

The project site is trapezoidal in shape (see Figure 3-2) with approximately 398 feet along the Broadway frontage on the east and approximately 167 feet along 30th Street on the south. The site’s west boundary is approximately 385 feet and edged by a concrete retaining wall that is the exterior wall of the adjacent building. The height of the wall ranges from approximately 10 feet at its 30th Street end, to approximately four feet where it ends at the project site’s northwest corner.

According to Sanborn Maps and historic aerial photos, previous uses on the project site were open lands associated with Saint Mary’s College playfields in the early part of the century; automobile sales with associated small office kiosks and associated paved parking lots through the mid 1940s and 1950s; with a small car wash structure added in the 1960s. By the 1980s all structures were removed, and the site continued to be a paved lot for automotive sales lots, until the most recent use for private parking (Basics Environmental, 2012).

Historic Resources

There are three individual properties near the project site that are considered historical resources for CEQA purposes: (1) the McConnell GMC Pontiac Cadillac/Bay City Chevrolet building directly north of the project site (at the southwest corner of Hawthorne and Broadway); (2) Grandjean Burman GM Co-Alzina garage / Window Tinting Plus (one half block north of the project site, across Broadway); and (3) Firestone Tire & Rubber service station/Mercedes Benz of Oakland (one-half block south of the project site, across Broadway). The project site is also situated within the Broadway Auto Row District Area of Secondary Importance (ASI), which is a distinctive early 20th century commercial district of automobile related uses (showrooms and services). (See detailed description of existing resources in Section 4.4, *Cultural Resources*, in Chapter 4 of this EIR.)

Site Coverage, Utilities and Environmental Conditions

The project site is currently 100 percent paved, and storm water runoff from the project site is currently collected within storm drains along Broadway and 30th Street. Public water, electric, natural gas, and sewage service are currently available to the site. Underground utility vaults exist along the sidewalk areas along Broadway.

A Phase 1 Environmental Site Assessment was conducted for the project site in 2012 (Basics Environmental, 2012). The assessment concluded that no contamination or recognized environmental conditions are suspected or known to have occurred on the project site. There is one leaking underground storage tank (LUST) site at the site directly north of the project site, 3093 Broadway (the same site on which the historic McConnell GMC Pontiac Cadillac/Bay City Chevrolet building is located).

General Plan and Zoning

The General Plan land use designation on the project site is “Community Commercial.” The current Zoning classification on the site is “Community Commercial Zone 2” / “Overlay Broadway District” (CC-2/D-BR). As previously mentioned, the project site is also located in the proposed BVDSP Area, for which the City is currently preparing a vision and planning framework for future growth and development. The Final Specific Plan that is ultimately adopted by the City may incorporate changes to the General Plan that may result in changes to the land use designation and development standards for the project site.

Addresses/Assessor Parcel Numbers

The trapezoidal site is composed of four parcels at 3001, 3015, 3025 and 3039 Broadway; the corresponding County Assessor Parcel Numbers are 009-705-004; 009-705-005; 009-705-006; and 009-705-007.

3.1.3 Surrounding Area Characteristics

The area surrounding the project site includes a mix of health-related institutional, automotive sales and service, and commercial entertainment and dining uses. Directly abutting the project site on the **north** is a paved parking lot and the historic auto dealership building (McConnell GMC Pontiac Cadillac/Bay City Chevrolet, 3093 Broadway) that extends north to Hawthorne Avenue. Abutting the **west** boundary of the site is the previously mentioned skilled nursing facility (Oakland Healthcare and Wellness Center), which is a residential health facility for the elderly. The medical offices and residential health facility along Webster Street – one-half block west of the project site - is Pill Hill’s eastern edge. Pill Hill includes the Alta Bates Summit Medical Center and other medical-related offices within an approximately 15-square-block area west of the site to Telegraph Avenue.

To the **south**, across 30th Street is a bank (Summit Bank), private surface parking, and medical offices that front Webster Street. To the **east**, across and fronting Broadway, are the 3000 Broadway Bar and Restaurant, and a mix of commercial uses (automotive sales and services, plumbing/heating and trenching services, and automotive rental). East of the Broadway frontage (along Brook Street) are additional auto-related uses and low-density residences (see Figure 3-2.)

The 19th Street BART station is located about one mile south of the project site, and the MacArthur BART station is located approximately 0.80 mile to the northwest. AC Transit bus service is provided along Broadway, and there is a transit stop at 30th Street and Broadway, adjacent to the project site.

3.2 Project Objectives

Portfolio Development Partners LLC, the project sponsor, seeks to achieve the following objectives through implementation of the Project:

1. Redevelop an underutilized paved parking lot along Broadway with a high-quality grocery store, Sprouts Farmers Market, that offers a comprehensive range of products to Sprouts' customers, including local residents, businesses, and organizations, in a functional, customer-friendly, and attractive manner.

2. Provide the opportunity for several small retail tenants to locate adjacent to the grocery store, thereby expanding the availability of attractive retail opportunities and pedestrian activity on a portion of Broadway that currently lacks sufficient retail and pedestrian-friendly amenities.

3. Consistent with the goals of the proposed Draft Broadway Valdez Specific Plan, stimulate economic activity and vitality in the project area by developing a privately funded retail project that will be a catalyst for additional retail and other development in the project area.

4. Provide sufficient, safe, inviting, and well-lit off-street parking and bicycle parking to serve the retail customers.

5. Provide new areas of publicly accessible plazas and seating areas that will enhance the surrounding neighborhood, provide gathering places, and establish an attractive and inviting setting for pedestrian friendly shopping.

6. Develop the Project in a manner that will be sensitive to the surrounding uses and will minimize neighborhood impacts.

7. Develop a Project that is financially feasible and provides a sufficient investment return.

3.3 Project Characteristics

This section describes, through text and graphics, the components of the Project, which, combined with all parts of this chapter, constitute the CEQA Project analyzed in this EIR.

3.3.1 Proposed New Construction

Commercial Development

The Project would construct a new, one-story development with 36,000 square feet of high volume retail space and associated parking. The new development would occupy the majority of the project site.

Specifically, the development would include a 26,000 square-foot retail anchor tenant, Sprouts Farmers Market, and a separate 10,000 square–foot commercial building currently planned to accommodate three retail tenant spaces, as depicted in **Figure 3-3**, **Ground Floor Plan**. The Project would also include a rooftop parking deck with amenities, discussed further below and depicted in **Figure 3-4, Roof Plan**. An overall view of the project is depicted in **Figure 3-5,**

Axonometric View. The commercial building has not yet been leased and therefore its final tenant configuration may change.

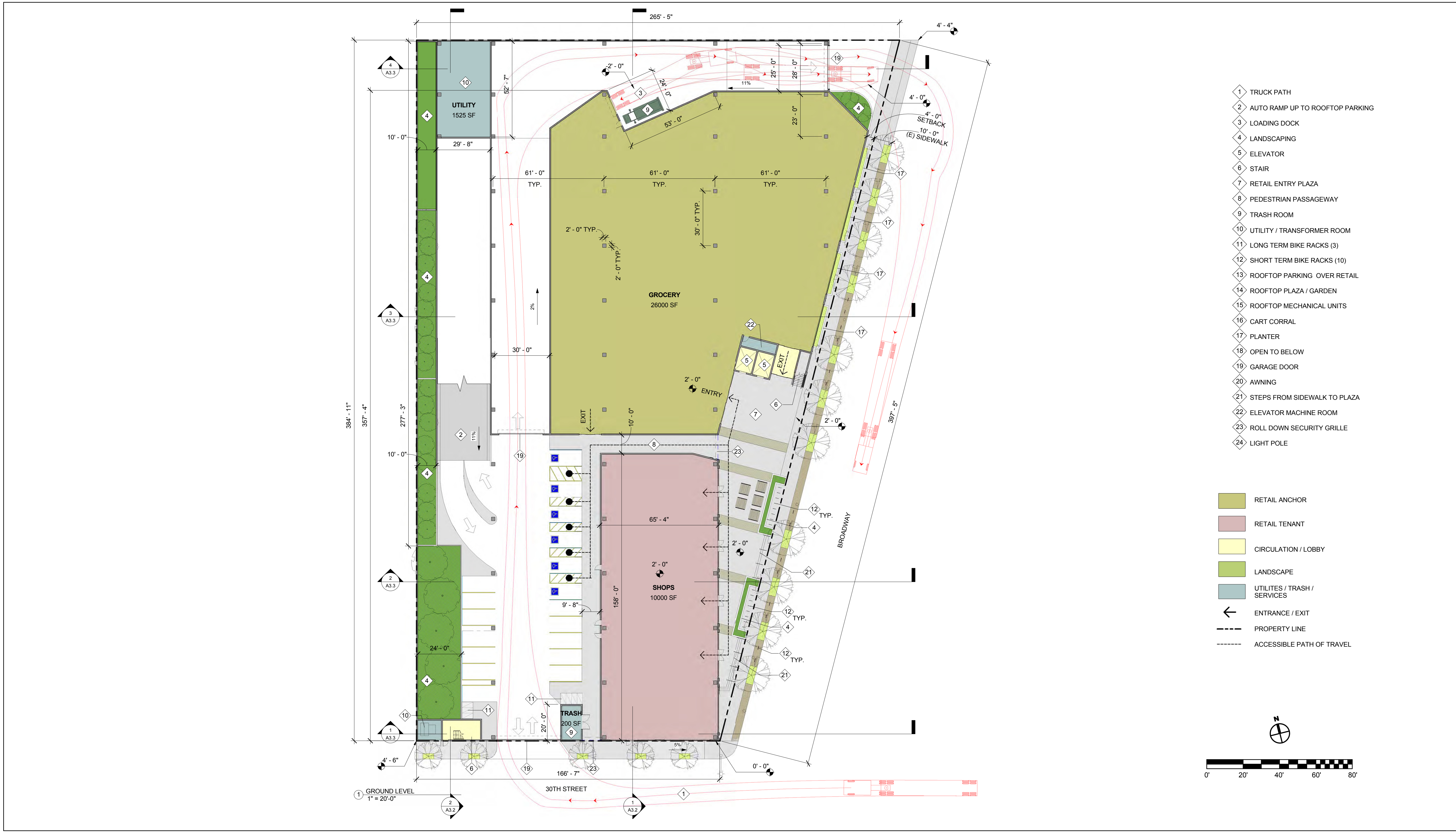
Broadway Frontage and West Facade

As shown in **Figure 3-6**, **Elevations,** and **Figure 3-8, Key 3D Views**, the corner of Broadway and 30th would have a signature retail space element in terms of design. All retail areas would be oriented along Broadway and would be primarily accessed through a public plaza connected to the sidewalk along Broadway. Planters and steps would define the edge of the plaza, which would provide a public gathering area with café style seating for customers (see Figure 3-3). Short-term bicycle parking areas would be provided in the plaza space (see *Parking, Access and Circulation*, below, for bicycle parking detail). A rooftop plaza and garden would provide seating for customers, as shown in Figure 3-4.

The west façade of the proposed building faces the existing residential health facility for the elderly. As previously mentioned and depicted in **Figure 3-7, Sections,** a concrete retaining wall that is the lower parking level of the adjacent residential health facility edges the west property line of the project site and ranges from approximately 10 feet at its 30th Street end to approximately four feet where it ends at the project site's northwest corner. The 30th Street end of the adjacent retaining wall is shown in photo #10 on Figure 4.1-4 in Section 4.1, *Aesthetics*, in Chapter 4 of this EIR; the façade of the wall can be seen in photo #2 in Figure 4.1-2 in Section 4.1, *Aesthetics*. The Project's facing elevation is shown in Figure 3-6 and includes a solid wall, behind which is the automobile ramp to/from the upper level parking deck. The ramp is not roofed, as shown in Figure 3-5. As shown in the sections in Figure 3-7, the top of the solid wall along the ramp ranges from 11 foot-6 inches to 13 foot- 6 inches above the safety barrier along the outdoor walkway to individual residential units facing the project site.

Pedestrian Circulation

A pair of elevators and a stairway would provide the pedestrian connection between the ground-floor plaza level and the rooftop plaza (and rooftop parking, discussed below). A second exit stairway at the southeast corner of the roof would allow customers to exit the rooftop directly to 30th Street, where they can access the Broadway entrances to the retail shops via the sidewalk or a ground-level pedestrian passageway that connects the lower-level garage and the plaza space. See the internal connections of the proposed uses in the ground floor plan in Figure 3-5 and the 3-D views in 3-8. The project sponsor proposes to locate the anchor tenant, Sprouts, on Broadway, mid-block between 30th and Hawthorn Streets, so that it would encourage customer traffic to the shops within the Project and "anchor" the entire block, thereby encouraging pedestrian traffic to future mixed use retail and residential development and services that the City envisions would eventually develop on adjacent properties, pursuant to the proposed BVDSP.

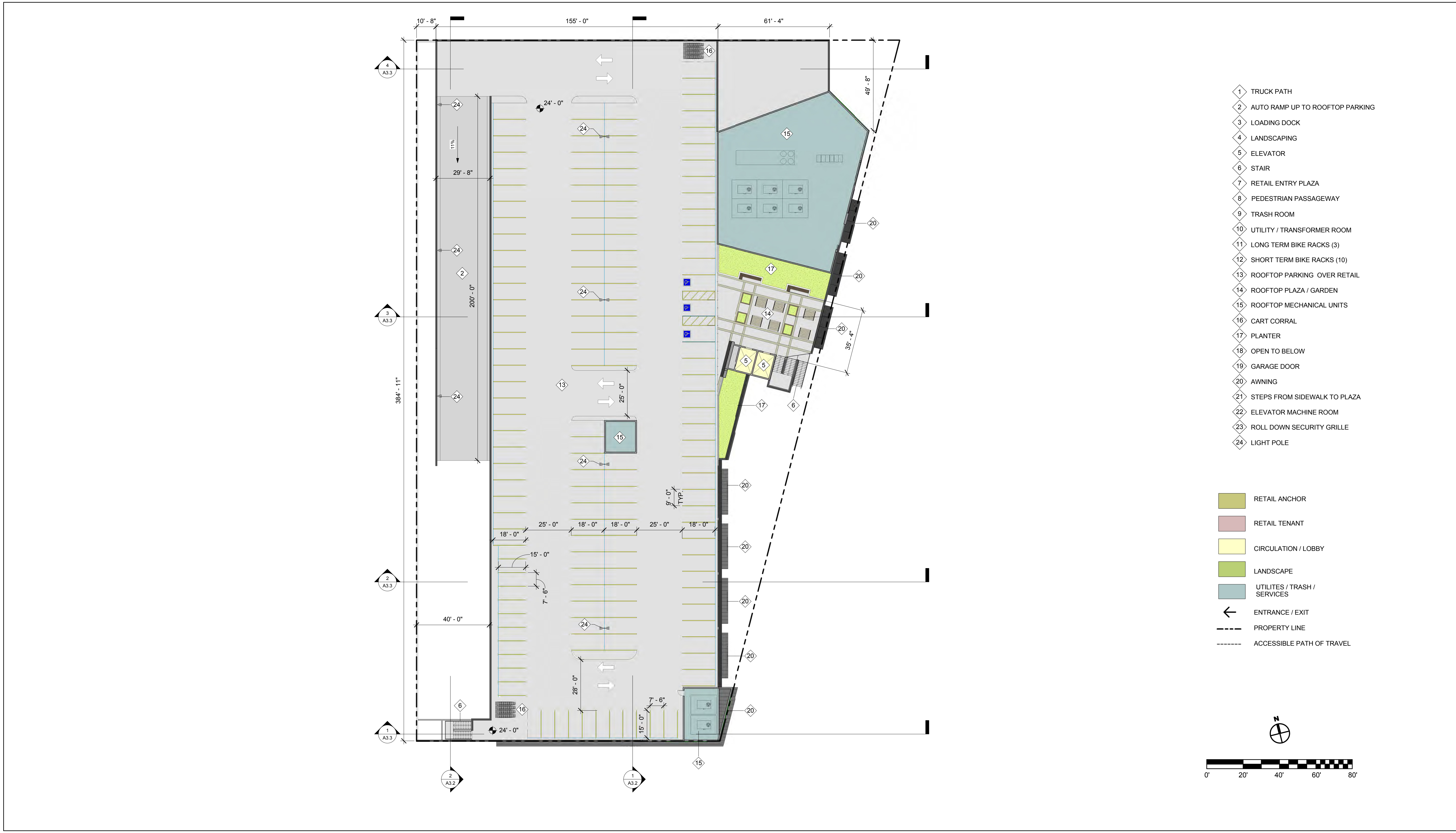


SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 3-3

Ground Floor Plan

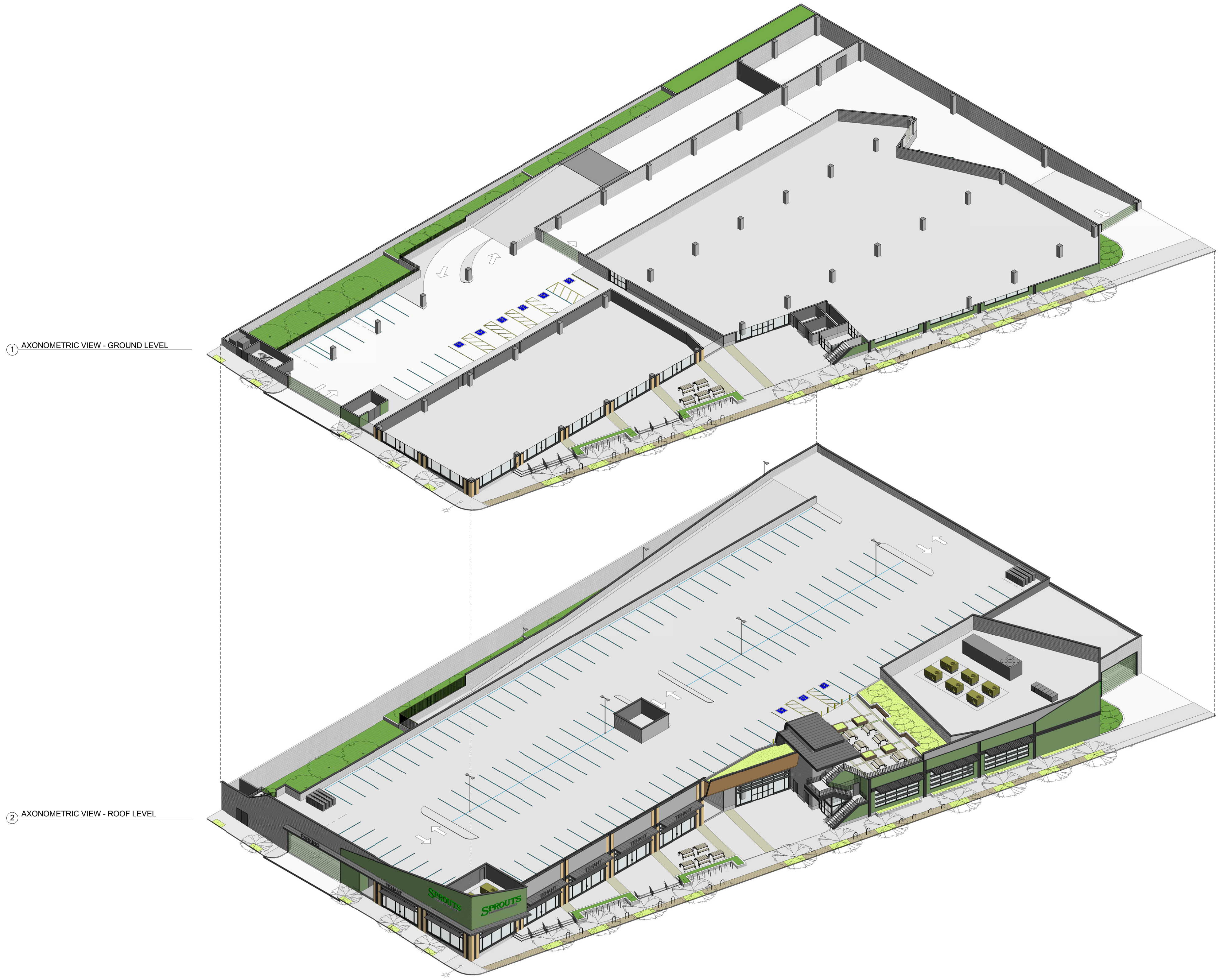


SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 3-4

Roof Plan

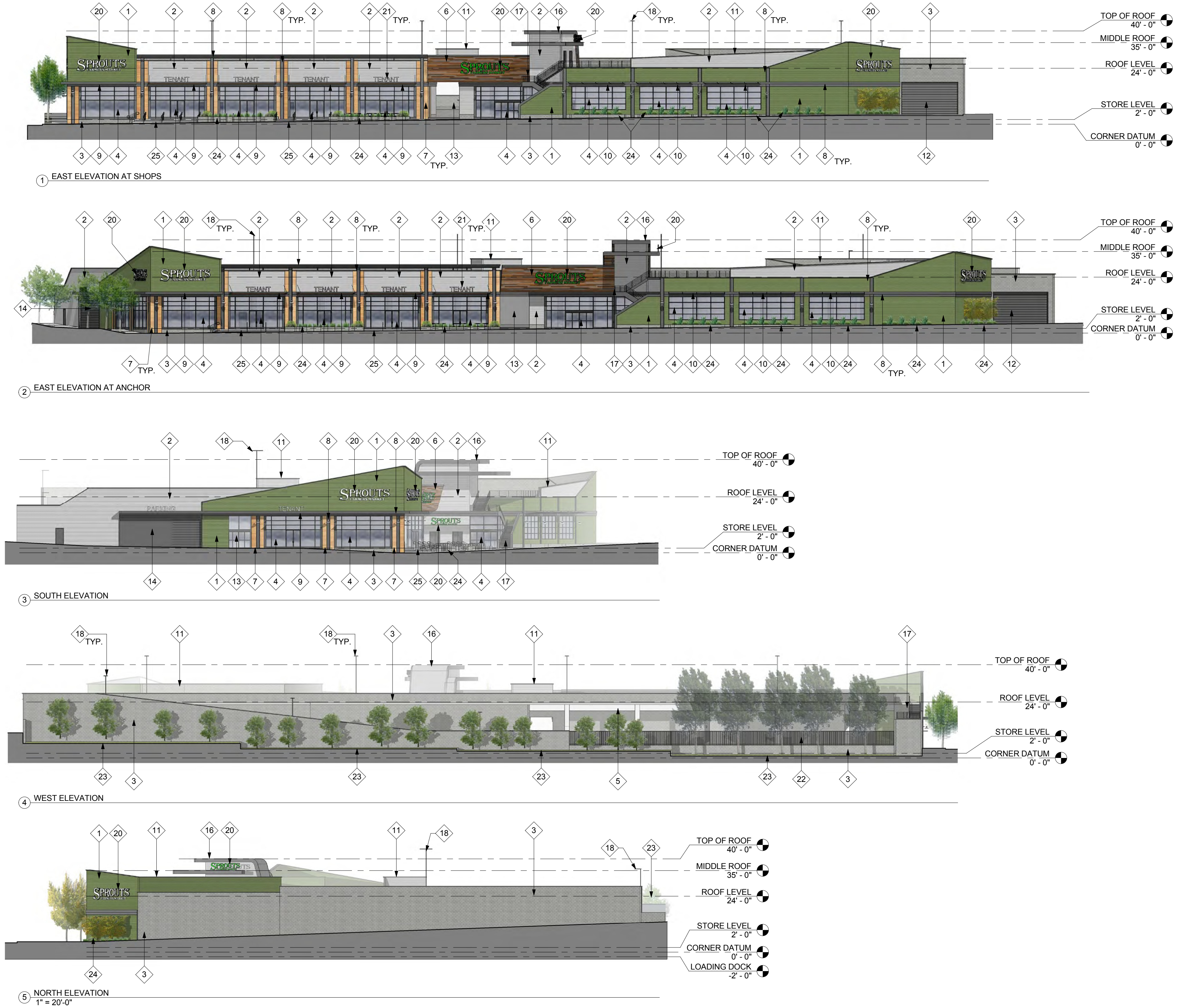


SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 3-5

Axonometric View



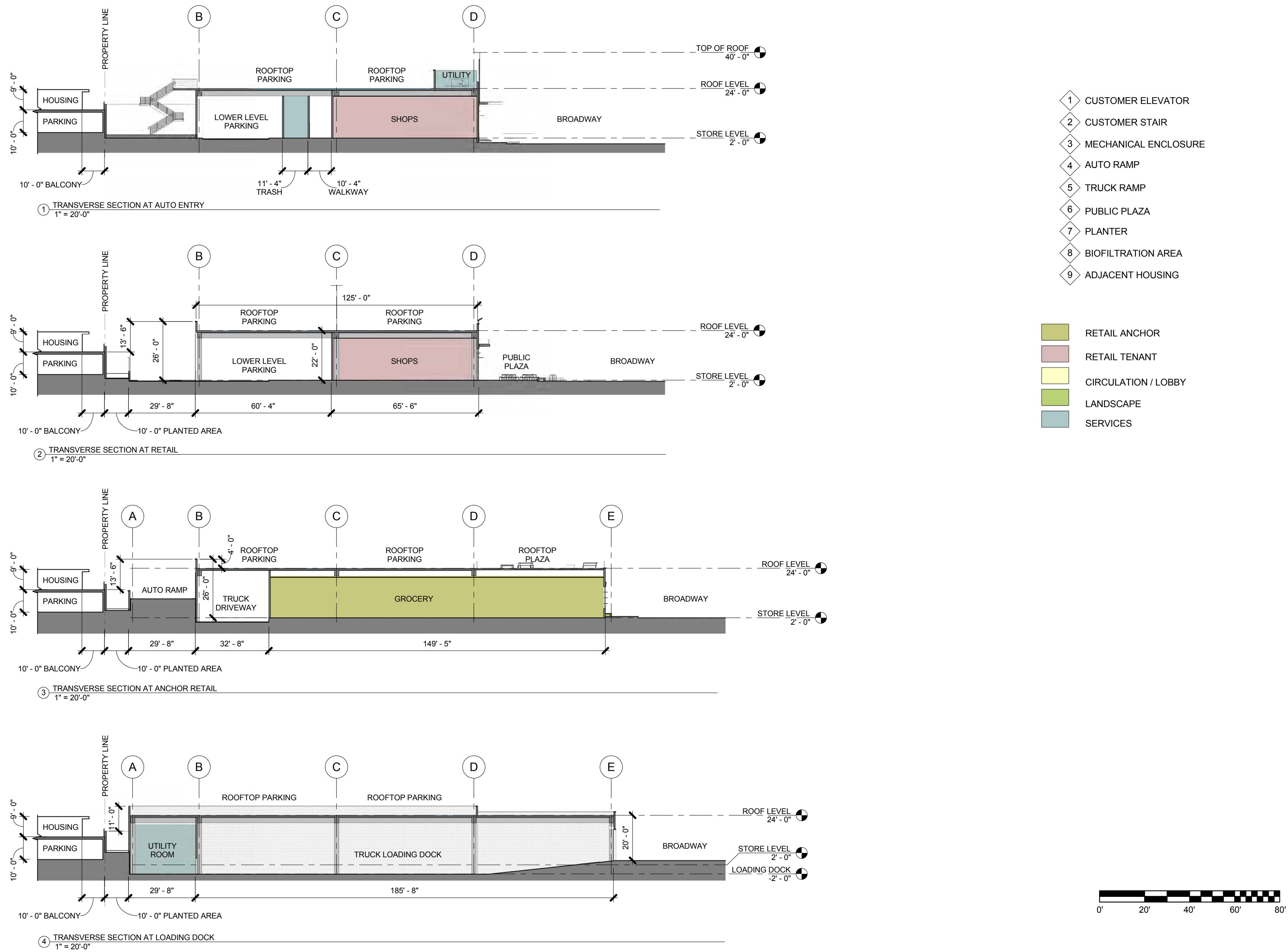
1. GREEN CORRUGATED METAL
2. GRAY CORRUGATED METAL
3. CONCRETE MASONRY BLOCK
4. STOREFRONT GLAZING SYSTEM TYPICAL DARK ANODIZED OR BLACK
5. CONCRETE STRUCTURE POURED IN PLACE AND PRE-CAST
6. RECLAIMED WOOD SIDING
7. TERRA COTTA CLADDING
8. ARCHITECTURAL METAL DETAILS PAINTED DARK GRAY
9. ARCHITECTURAL METAL AWNING WITH RECLAIMED WOOD UNDERSIDE
10. ARCHITECTURAL METAL TRELLIS DARK ANODIZED OR BLACK
11. SCREENED ROOFTOP MECHANICAL EQUIPMENT (TBD)
12. TRUCK EXIT FROM COVERED TRASH AND LOADING
13. PEDESTRIAN BREEZEWAY CONNECTING COVERED PARKING TO SHOPS
14. COVERED STREET LEVEL PARKING AREA
15. ROOF PLAZA AT UPPER PARKING DECK
16. CUSTOMER ELEVATORS
17. CUSTOMER STAIRWAY
18. SHIELDED PARKING LIGHTING
19. BUILDING LIGHTING
20. SPROUTS SIGNAGE
21. TENANT RETAIL SIGNAGE (TBD)
22. METAL FENCE
23. PLANTED BIO-FILTRATION WATER TREATMENT AREA
24. RAISED PLANTER
25. STEPS UP TO PUBLIC PLAZA

0' 20' 40' 60' 80'

SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 3-6
Elevations



SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 3-7

Sections

30TH AND BROADWAY CORNER

SPROUTS ENTRY

NORTH CORNER OF SPROUTS

PARKING LOT ENTRY

SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 3-8

Key 3D Views

Parking, Access and Circulation

The Project would provide a total of 162 parking spaces on two parking levels. At ground level, 18 at-grade parking spaces would be provided behind the retail tenant spaces (see Figure 3-3). These spaces would be prioritized for accessible and short-term parking. Customers and staff arriving by automobile would continue up a ramp on the west side of the site to the rooftop parking deck, which would provide the additional 144 parking spaces. Nine of the total parking spaces would be handicapped accessible as per ADA standards. The rooftop parking deck would be approximately 24 feet above grade. The aforementioned two elevators and stairways (see *Pedestrian Circulation*, above) would provide pedestrian access to both parking levels (see Figures 3-3, 3-4 and 3-8).

A total of 30 short-term bicycle parking spaces (i.e., bicycle racks) would be provided along the Project's Broadway frontage and plaza for customer use. Project employees would use the seven long-term bicycle parking space provided near the driveway entrance to the ground-floor parking level.

Loading and Service Areas

Delivery and service trucks would access the project site through the 30th Street curb cut/driveway, but would continue through a secured garage door to where the grocery's loading dock and trash area would be located along the northern edge of the project site (see the ground floor plan in Figure 3-3). Delivery and service trucks would exit through another secured garage door and new driveway curb cut onto Broadway at the northeast corner of the site (replacing and relocating the existing driveway located mid-block on Broadway, as depicted in Figure 3-8). Trucks would be restricted to only turn right to travel southbound on Broadway.

An approximately 7,000 square-foot area adjacent to the rooftop plaza containing the mechanical equipment serving the grocery store and retail spaces, would be situated on the roof level (see Figure 3-4) and would be screened from public views from ground-level as well as from the rooftop parking deck. Additional mechanical units serving the other retail tenant spaces would be located on the roof deck, at the southeast corner of the building. An approximately 1,550 square-foot utility/transformer room would be located in the ground-floor parking level, beneath the driveway ramp to the rooftop parking deck. Two main trash collection areas would be located in the ground-floor parking level (see Figure 3-3). The Project does not include a diesel generator.

Sustainability and Green Building Elements

The Project proposes to incorporate a number of Green Building elements, in addition to the requirements it would be required to implement as part of the City's *Standard Conditions of Approval and Uniformly Applied Development Standards* related to greenhouse gases and energy reductions (which are detailed in Section 4.6, *Greenhouse Gases and Climate Change*, in Chapter 4 of this EIR). The project applicant's qualified consultant prepared a LEED 2009 Project Checklist as part of its Project Application for new construction to the City. In addition to the project site being located in direct proximity to major public transportation, proposed Project characteristics that support the Project's qualification for LEED certification include the following, as an example:

- Public transportation access
- Bicycle storage
- Accommodations for low-emittting and fuel-efficient vehicles
- Stormwater design focused on controlling quantity and quality
- Water efficient landscaping
- Water use reductions
- Minimum and optimized energy performance
- Construction waste management
- Use of recycled content
- Use of low-emitting construction materials
- Project design by a LEED Accredited professional

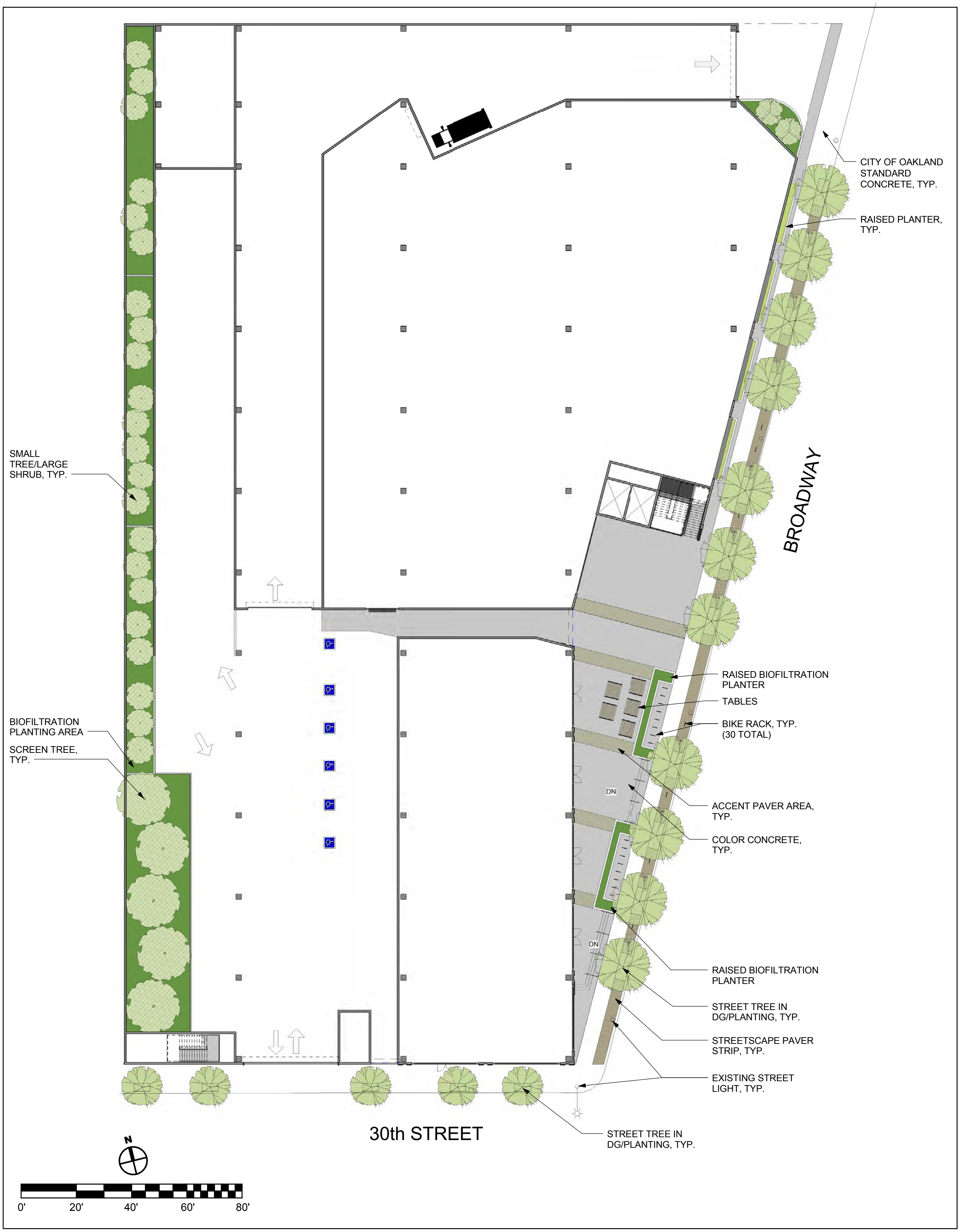
Where feasible, these elements are depicted in the Project plans in this chapter, and have been factored into the relevant analysis throughout Chapter 4 to this EIR.

Landscaping, Lighting and Public Realm Improvements

The Project's landscaping would be concentrated around the perimeter of the site. As shown on the ground floor plan in Figure 3-3, a landscaped buffer 10- to 24-feet wide would be created along the western boundary of the site, between the proposed development and the abutting residential health facility.

As shown in **Figure 3-9, Ground-Floor Landscape Plan**, this and other areas onsite would contain plantings and biofiltration characteristics designed to manage the stormwater runoff of the site. Other landscaping would focus on creating attractive pedestrian spaces and successful transitions to the adjoining streets on the ground level and on the rooftop parking level, as shown in **Figure 3-10, Roof Landscape Plan**. New street trees would be planted along the street frontages (replacing approximately nine existing right-of-way trees), and as mentioned under *Broadway Frontag*e, above, planters would help define the edge of the plaza along Broadway. The Broadway sidewalk would be widened from an existing 10 feet to 14 feet.

New lighting on and within the new development would serve functional and aesthetics purposes. Building lighting would occur within the ground-floor parking and loading areas, within the retail spaces, as well as lighting cast on new retail signage along the street frontages. Lighting on the upper-level parking deck (see Figure 3-4) specifically would involve four back-to-back, 20-foot tall *Gardco Pureform* light poles are spaced 90 feet apart on the roof deck, centered on the parking rows. The poles would be located at least 63 feet away from the edge of the roof deck and 103 feet away from the west property line. The Project also proposes lighting on the ramp up to the roof deck, which would involve wall mounted lighting that faces away from the west property line. Overhead lighting is not proposed.



SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 3-9

Ground-Floor Landscape Plan

SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 3-10

Roof Landscape Plan

Site Preparation, and Utilities

The Project would require excavation for installation of building foundations and underground utilities. Because the Project would require new building service connections, the Project would upgrade any existing four-inch and six-inch distribution lines to ensure the minimum fire flow for compliance.

Given that the project site is fully paved, the Project proposed new pervious surfaces, including permeable pavers and storm water bioretention planting areas and biofiltration planters, as shown in the ground-floor landscape plan in Figure 3-9. The Project proposes approximately 3,736 square feet of stormwater treatment area on the project site.

The project sponsor plans to initiate construction in early 2014, with a target for business to commence in spring 2015. Site preparation and construction activities required for the Project would occur for approximately 12 months. Site preparation (removal of pavement, excavation and grading) would occur for approximately six weeks, building construction would occur for 9 to 10 months, and an additional two weeks would be required for paving and architectural finishes. Specifically regarding earth movement, approximately 7,000 cubic yards of soil and debris would be removed, and 3,000 cubic yards would be excavated and re-compacted. These activities would overlap and occur for about one week total.

3.4 Discretionary Actions and Other Planning Considerations

Pursuant to the CEQA Guidelines (Section 15051), the City of Oakland is the Lead Agency responsible for preparation of this EIR. The EIR is intended to provide CEQA clearance for all required discretionary actions and/or approvals for the Project. At the time this EIR was prepared, the discretionary actions or approvals and other considerations and approvals anticipated to be required for the Project include those listed below, without limitation.

3.4.1 City of Oakland

- **Conditional Use Permits** (Planning Code Table 17.101C.100) – The Project would be required to obtain a Conditional Use Permit for new construction greater than 10,000 square feet in the B-DR Zone and for Alcoholic Beverage Sales (Planning Code Table 17.35.01; Table 17.101C.01; 17.102.210).

- **Variance (Planning Code** Chapter 17.116) **–**The Project would require City approval of variances for a reduced front yard setback, for not meeting the minimum building height, and for one loading berth where two are required.

- **Design Review (Planning Code Chapter 17.35.020; 17.136.120) –** Design review approval is required for the Project for new construction, for a master sign program, and as required for the CC-2 Zone.

- **Encroachment and Construction Permits** (Municipal Code 12.08) – The Project would require City approval of encroachment and obstruction permits to work within and close to various public rights-of-way.

- **Excavation Permits** (Municipal Code 12.12) – The Project would require City approval of excavation permits to conduct excavation activities on the project site.

- **Tentative Parcel Map** – A Tentative Subdivision map would have to be approved and recorded for the proposed lot merger of four lots into one.

3.4.2 Other Agencies

Portions of the Project may require review and approval by a number of other public and quasi-public agencies with jurisdiction over specific aspects of the Project. It is anticipated that these other agencies will rely upon this EIR in their review and decision-making processes. A list of these other agencies and their jurisdictional permits and approvals include the following:

- **San Francisco Bay Regional Water Quality Control Board (RWQCB)** – Acceptance of a Notice of Intent (NOI) to obtain coverage under the General Construction Activity Storm Water Permit (General Construction Permit) and Notice of Termination after construction is complete. Granting of required clearances to confirm that all applicable standards and conditions for all previous contamination at the site have been met.

- **Bay Area Air Quality Management District (BAAQMD)** – Compliance with BAAQMD Regulation 2, Rule 1 (General Requirements) for all portable construction equipment subject to that rule.

- **East Bay Municipal Utility District (EBMUD)** – Approval of new service requests and new water meter installations.

- **Alameda County Flood Control and Water Conservation District (ACFWCD)** – Enforcement of the Stormwater Quality Management Plan and Best Management Practices (BMPs) included in the Alameda Countywide Clean Water Program‘s Stormwater Pollution Prevention Permit (SWPPP). This is done in conjunction with the City of Oakland, one of 18 co-permittees.

- **California Department of Toxic Substances Control (DTSC) -** Ensuring compliance with state regulations for the generation, transportation, treatment storage and disposal of hazardous waste.

CHAPTER 4

Environmental Setting, Impacts, Standard Conditions of Approval and Mitigation Measures

This Draft EIR has been prepared in accordance with CEQA, as amended (Public Resources Code Section 21000, et seq.), and the CEQA Guidelines (California Code of Regulations Sections 15000 through 15378).

This chapter contains the analysis of the potential effects to environmental topics considered under CEQA from development of the Project. This chapter describes the existing setting for each topic, the potential impacts that could result from development of the Project, relevant plans and policies, and Standard Conditions of Approval that would minimize or avoid potential adverse environmental effects that could result, and identifies mitigation measures necessary to reduce the potential impacts resulting from development of the Project.

The following provides an overview of the scope of the analysis included in this chapter, organization of the sections, the methods for determining what impacts are significant, and the applicability of the City's Uniformly Applied Development Standards and Standard Conditions of Approval.

4.01 Environmental Topics

The following Sections in this chapter analyze the environmental topics as listed below and presented in the Table of Contents at the front of this document:

4.1 Aesthetics
4.2 Air Quality
4.3 Biological Resources
4.4 Cultural Resources
4.5 Geology, Soils and Geohazards
4.6 Greenhouse Gases and Climate Change
4.7 Hazardous Materials
4.8 Hydrology and Water Quality
4.9 Land Use, Plans and Policies
4.10 Noise
4.11 Public Services
4.12 Transportation and Circulation
4.13 Utilities and Service Systems
4.14 Other Less-than-Significant Effects

The topics of Agriculture and Forestry Resources; Mineral Resources; Population, Housing and Employment; Recreation; and public schools and parks usage were determined not to be directly relevant to the Project or have notable effects and are briefly discussed in Section 4.14, *Other Less-than-Significant Effects*.

4.02 Format of Environmental Topic Sections, Impact Statements, and Mitigation Measures

Each environmental topic section generally includes two main subsections:

- *Existing Setting*, which includes baseline conditions, regulatory setting, Thresholds/Criteria of Significance, and identification of applicable Standard Conditions of Approval (which are discussed below); and
- *Impacts and Mitigation Measures*, which identifies and discusses the potential impact and cites applicable Standard Conditions of Approval and mitigation measures that would, to the extent possible, reduce or eliminate adverse impacts identified in this chapter.

This EIR identifies all impacts with an abbreviated designation that corresponds to the environmental topic addressed (e.g., "HAZ" for hazardous materials). The topic designator is followed by a number that indicates the sequence in which the impact statement occurs within the section. For example, "Impact HAZ-1" is the first (i.e., "1") hazardous materials impact identified in the EIR. All impact statements are presented in bold text. Generally, topics for which there is no impact do not have a topic/number designator. The number of the significance criterion being addressed by the impact statement is indicated immediately following the impact statement; the criterion number refers to the listing of the significance criteria within each section (which is generally consistent with the numbering in the City of Oakland's Thresholds/Criteria of Significance Guidelines, discussed below).

The Impact Classification (discussed below) of the Project's effects prior to implementation of mitigation measures is stated in parentheses immediately following the applicable criterion number (discussed above). The Impact Classification stated in the parentheses immediately following the impact statement does, however, already incorporate the City's Standard Conditions of Approval and Uniformly Applied Development Standards, discussed below.

Similarly, each mitigation measure is numbered to correspond with the impact that it addresses. Where multiple mitigation measures address a single impact, each mitigation measure is numbered sequentially. For example "Mitigation Measure HAZ-1" would be the first mitigation identified to address the first hazardous materials impact (i.e., "HAZ"). All mitigation measure statements are presented in bold text.

4.03 Thresholds/Criteria of Significance

Under CEQA, a significant effect is determined as a substantial, or potentially substantial, adverse change in the environment (Public Resources Code Section 21068). Each *Impact and Mitigation Measures* discussion in this chapter is prefaced by criteria of significance, which are the thresholds for determining whether an impact is significant.

This criteria of significance used in this EIR are from the City of Oakland's Thresholds/Criteria of Significance Guidelines (updated May 22, 2013). The City has established these Thresholds/Criteria of Significance Guidelines to help clarify and standardize analysis and decision-making in the environmental review process in the City of Oakland. The Thresholds are offered as guidance in preparing environmental review documents. The City uses these Thresholds unless the location of the project or other unique factors warrants the use of different thresholds. The Thresholds are intended to implement and supplement provisions in the CEQA Guidelines for determining the significance of environmental effects, including CEQA Guidelines Sections 15064, 15064.5, 15065, 15382, and Appendix G, and form the basis of the City's Initial Study and Environmental Review Checklist[1].

The Thresholds are intended to be used in conjunction with the City's Standard Conditions of Approval and Uniformly Applied Development Standards (see discussion below), which are incorporated into projects regardless of the determination of a project's environmental impacts.

CEQA requires the analysis of potential adverse effects of a project on the environment. Potential effects of the environment on a project are legally <u>not</u> required to be analyzed or mitigated under CEQA. However, this EIR nevertheless analyzes potential effects of "the environment on the project" in order to provide information to the public and decision-makers. Where a potential significant effect of the environment on the project is identified, the document, as appropriate, identifies City Standard Conditions of Approval and/or project-specific non-CEQA recommendations to address these issues.

4.04 Standard Conditions of Approval and Uniformly Applied Development Standards

The City's Standard Conditions of Approval and Uniformly Applied Development Standards (referred to in the EIR as "Standard Conditions of Approval," SCA's or Conditions of Approval) are incorporated into projects as conditions of approval regardless of a project's environmental determination. As applicable, the Standard Conditions of Approval are adopted as requirements of an individual project when it is approved by the City and are designed to, and will, substantially mitigate environmental effects.

In reviewing project applications, the City determines which Standard Conditions of Approval are applied, based upon the zoning district, community plan, and the type(s) of permit(s)/approval(s) required for the project. Depending on the specific characteristics of the project type and/or project site, the City will determine which Standard Conditions of Approval apply to a specific project. For example, Standard Conditions of Approval related to creek protection permits will only be applied to projects on creekside properties.

All relevant Standard Conditions of Approval have been incorporated as part of the analysis for the Project. Because Standard Conditions of Approval are mandatory City requirements, the impact analysis assumes that these will be imposed and implemented by a project. If a Standard Condition of Approval would reduce a potentially significant impact to less than significant,

1 Although no Environmental Review Checklist was prepared for this EIR, the factors listed for consideration in the Environmental Review Checklist are evaluated in this EIR.

the impact is determined to be less than significant and no mitigation is imposed. Standard Conditions of Approval are not listed as mitigation measures.

The Standard Conditions of Approval incorporate development policies and standards from various adopted plans, policies, and ordinances (such as the Oakland Planning and Municipal Codes, Oakland Creek Protection, Stormwater Management and Discharge Control Ordinance, Oakland Tree Protection Ordinance, Oakland Grading Regulations, National Pollutant Discharge Elimination System permit requirements, Housing Element-related mitigation measures, California Building Code, and Uniform Fire Code, et al.), which have been found to substantially mitigate environmental effects. Where there are peculiar circumstances associated with a project or project site that will result in significant environmental impacts despite implementation of the Standard Conditions of Approval, the City will determine whether there are feasible mitigation measures to reduce the impact to less than significant levels.

4.05 Impact Classifications

The following level of significance classifications are used throughout the impact analysis in this EIR:

- **Less than Significant (LS) –** The impacts of a proposed project, either before or after implementation of standard conditions of approval, do not reach or exceed the defined Threshold/Criteria of Significance. Generally, no mitigation measure is required for a LS impact.

- **Potentially Significant (PS)** – The impact of a proposed project may reach or exceed the defined Threshold/Criteria of Significance, however it is not evident that, even in the theoretical worst-case standard conditions, a significant impact would occur. Where feasible, standard conditions of approval and/or mitigation measures are identified to reduce the PS impact to LS.

- **Significant (S)** – The impact of a proposed project is expected to reach or exceed the defined Threshold/Criteria of Significance. Feasible mitigation measures and/or standard conditions of approval may or may not be identified to reduce the significant impact to a LS impact.

- **Significant Unavoidable (SU)** – The impact of a proposed project reaches or exceeds the defined Threshold/Criteria of Significance. No feasible mitigation measure is available to reduce the S impact to LS. In these cases, feasible mitigation measures are identified to reduce the S impact to the maximum feasible extent, and the significant impact is considered SU. Impacts are also classified as SU if a feasible mitigation measure is identified that would reduce the impact to LS, but the approval and/or implementation of the mitigation measure is not within the City of Oakland's or the project applicant's sole control, in which case the analysis cannot presume implementation of the mitigation measure and the resulting LS impact. It is important to clarify that SU is an impact classification that only applies *after* consideration of possible mitigation measures.

- **No Impact (N)** – No noticeable adverse effect on the environment would occur.

4.06 Environmental Baseline

Overall, pursuant to Section 15125(a) of the CEQA Guidelines, this EIR measures the physical impacts of the proposed project (i.e., the Shops at Broadway Project) against a “baseline” of physical environmental conditions at and in the vicinity of the project site. The environmental “baseline” is the combined circumstances existing around the time the NOP of the EIR was published, which is July 2012.[2] In most cases, the baseline condition relevant to the environmental topic being analyzed is described within each environmental topic section in this chapter. In some cases, discussion of the baseline condition is detailed or restated in the Impacts Analysis to provide the impact analysis in the most reader-friendly format and organization. The baseline also includes the policy and planning context in which the Project is proposed. This is discussed in detail within Section 4.9, *Land Use, Plans and Policies*, of this Draft EIR and identifies any inconsistencies between the Project and applicable, currently adopted plans and policies.

4.07 Cumulative Analysis

4.07.1 Approach to the Cumulative Analysis

CEQA defines cumulative as “two or more individual effects which, when considered together, are considerable, or which can compound or increase other environmental impact.” Section 15130 of the CEQA Guidelines requires that an EIR evaluate potential environmental impacts when the project’s incremental effect is cumulatively considerable. “Cumulatively considerable” means that the incremental effects of an individual project are significant when viewed in connection with the effects of past, present, existing, approved, pending and reasonably foreseeable future projects. These impacts can result from a combination of a proposed project together with other projects causing related impacts. “The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonable foreseeable probable future projects.” The City of Oakland’s analysis approach specifies “past, present, existing, approved, pending and reasonably foreseeable future projects.”

4.07.2 Cumulative Context

The context used for assessing cumulative impacts typically varies depending on the specific topic being analyzed to reflect the different geographic scope of different impact areas. For example, considerations for the cumulative air quality analysis are different from those used for the cumulative analysis of aesthetics. In assessing aesthetic impacts, only development within the vicinity of a project would contribute to a cumulative visual effect. In assessing air quality impacts, on the other hand, all development within the air basin contributes to regional emissions of criteria pollutants, and basin-wide projections of emissions is the best tool for determining the

2 Except as specified otherwise, any reference to “existing” conditions throughout this EIR refers to the baseline condition as of around July 2012.

cumulative effect. Accordingly, the geographic setting and other parameters of each cumulative analysis discussion can vary.

Generally, the City of Oakland's Major Projects list from May 2013 (provided as Appendix B to this Draft EIR), as well as cumulative development in the vicinity of the project site that could potentially result in an incremental impact when added to the Project, was used to identify relevant past, present, existing, approved, pending and reasonably foreseeable future projects. Example major cumulative projects located within or near the project vicinity include the Broadway Valdez District Specific Plan, Broadway West Grand Mixed-Use Project, Kaiser Center Office Project, Alta Bates Summit Medical Center Master Plan Project, Kaiser Permanente Oakland Redevelopment Project, City Walk/City Center T-10 Project, Jack London Square Redevelopment Project, and the Lake Merritt BART Station Area Plan. However, the Major Projects List is not intended as an inclusive list of cumulative projects considered in this EIR. As discussed above, cumulative projects considered in the cumulative context can vary by environmental topic; therefore, some of the Major Projects listed may not be directly relevant to the cumulative context, depending on the environmental topic.

In some cases, the cumulative context may include more development than listed in the Major Projects list. A primary example is the transportation analyses (and transportation-related traffic and air quality), which use the Alameda County Transportation Commission travel demand model, which reflects traffic from projects citywide and the broader regional context. Alternatively, as mentioned above, the aesthetics analysis would primarily consider projects within the viewsheds of the project site, which may not, for example, include projects on the list that are located in distant Oakland areas, particularly low-rise development not affecting the Oakland skyline.

The cumulative discussions in each topical section throughout this Chapter describe the cumulative geographic context considered for each topic at a level appropriate to the analysis presented in this EIR.

4.1 Aesthetics

This section describes the existing visual conditions of the project vicinity and analyzes how the Project may affect those conditions. The analysis includes how the development of the Project may affect the visual quality and visual character of the project area, scenic vistas and resources viewed from surrounding public areas, as well as lighting and glare. This section also describes the environmental and regulatory setting relevant to aesthetics and the Project. Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary.

4.1.1 Environmental Setting

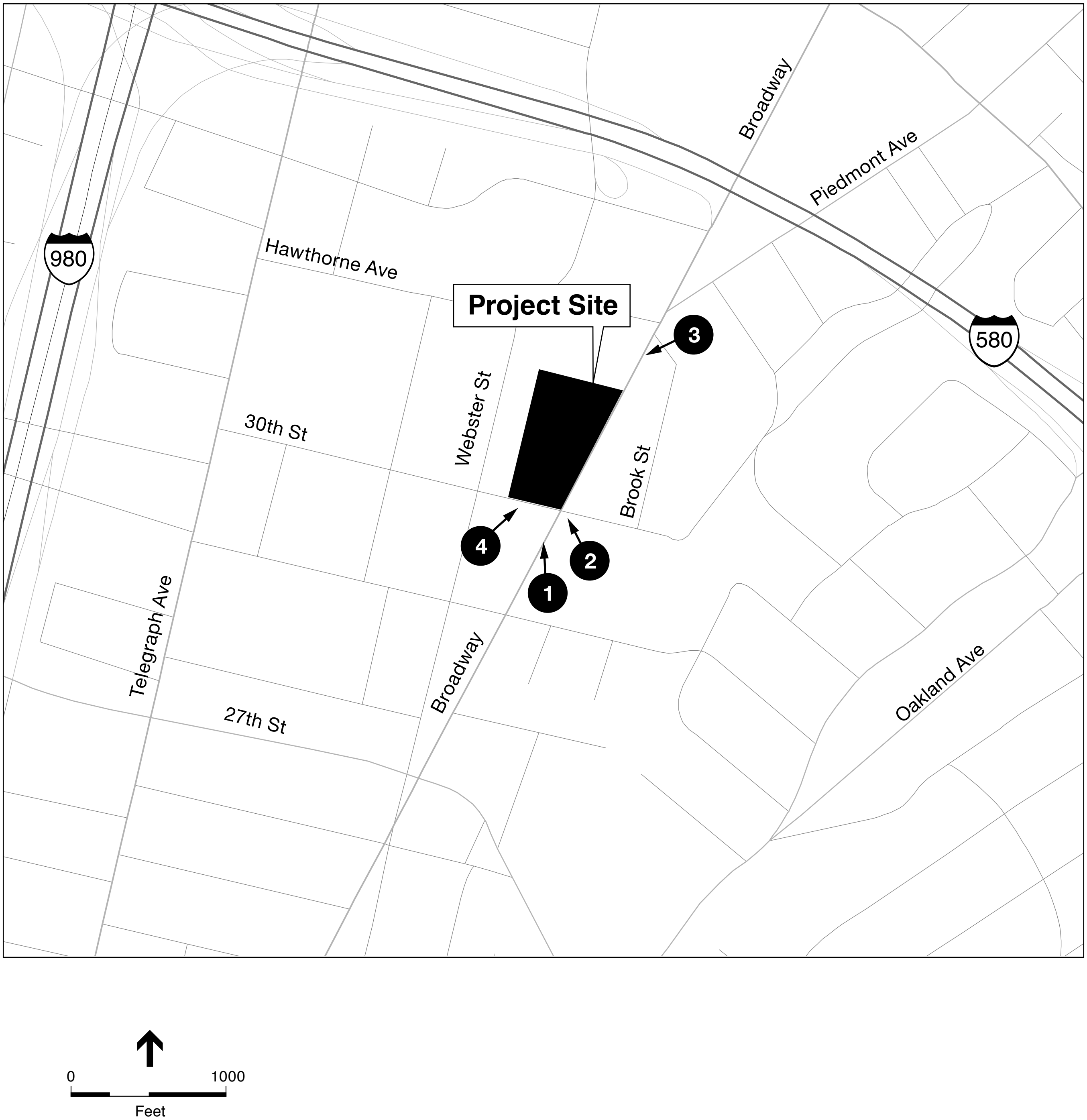
Visual Character in the Project Vicinity

This discussion focuses on the visual character of the area that includes and is generally visible from the Broadway corridor between 27th Street and the Interstate 580 (I-580) elevated freeway.

Figure 4.1-1, Viewpoint Key, shows the locations of four short-range views in the area of the Project, which are shown in **Figures 4.1-2** and **4.1-3, Views of Project Site Vicinity**. These views were selected in coordination with City staff to capture the conditions on and around the project site. These views convey the general character of the project area, as does the photo series of nearby properties shown in **Figures 4.-1-4** and **4.1-5, Site Context Photos**.

The physical form of the project vicinity is irregular and inconsistent. The irregular block pattern that is characterized by a series of triangular and trapezoidal shape blocks is a defining characteristic. Among other unique features that define the visual character in the area around the project site are the several distinctively designed buildings and a number of extra wide sidewalks, such as at Broadway/27th and Broadway/25th, which are used for a combination of public space and automobile showcases. Further, the overall lower lot coverage throughout the area reflects the concentration of automotive uses that devote large areas to sales lots and vehicle storage, and to the greater dependence on surface parking. Few blocks in the area around the project site have sections where buildings form a consistent street wall and active storefronts without major gaps. Curb cuts, driveways and roll-up garage doors, and uses that provide limited visual interest at the street level are common along Broadway and nearby side streets. Vegetation is minimal and is limited to street trees primarily along Broadway (see Figures 4.1-2 and 4.1-3).

The building character in the project vicinity is diverse. The majority of the buildings are older (constructed prior to 1950) and most were designed for automotive sales and service type uses, and therefore have large, open floorplates and tall ceilings. These older buildings contribute to the area’s visual character due to the quality of their construction and craftsmanship and their notable architectural styles (including Beaux Arts, Art Deco, Moderne, 1920s decorative brick, and early 20th century utilitarian service garages).



SOURCE: ESA

The Shops at Broadway Retail Project

Figure 4.1-1
Viewpoint Key

1 Looking north on Broadway from below 30th Street

2 Looking northwest from 30th & Broadway

SOURCE: Lowney Architecture

Figure 4.1-2
Views of Project Site Vicinity

3 Looking southwest from Broadway at midblock

4 Looking northeast from 30th Street midblock

SOURCE: Lowney Architecture

Figure 4.1-3
Views of Project Site Vicinity

01 - 2915 BROADWAY

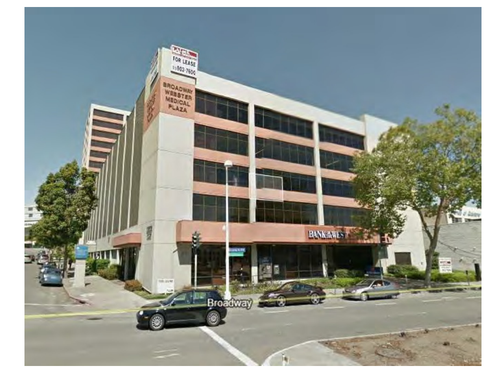
02 - 2939 BROADWAY

03 - 2943 BROADWAY

04 - 2965 BROADWAY

05 - 3093 BROADWAY

06 - 3093 BROADWAY

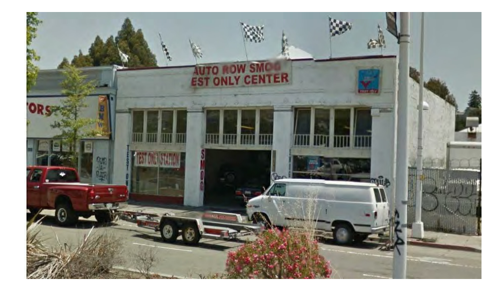


07 - 3305 BROADWAY

08 - 3080 BROADWAY

09 - 3074 BROADWAY

10 - 3068 BROADWAY



11 - 3060 BROADWAY

12 - 3050 BROADWAY

13 - 3050 BROADWAY

14 - 3040 BROADWAY

SITE KEY PLAN

SOURCE: Lowney Architecture

Figure 4.1-4

Site Context Photos A

01 - 3026
BROADWAY

02 - 3022
BROADWAY

03 - 3020
BROADWAY

04 - 3000
BROADWAY

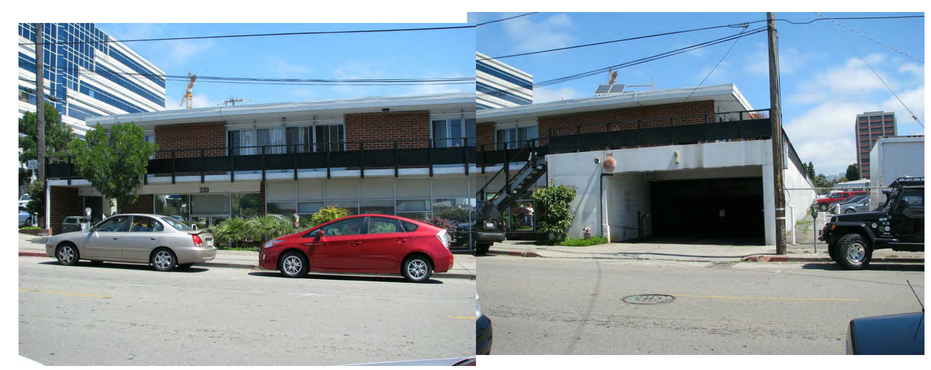
05 - 2964
BROADWAY

06 - 2900
BROADWAY

07 - 2900
BROADWAY

08 - 250 30TH
STREET

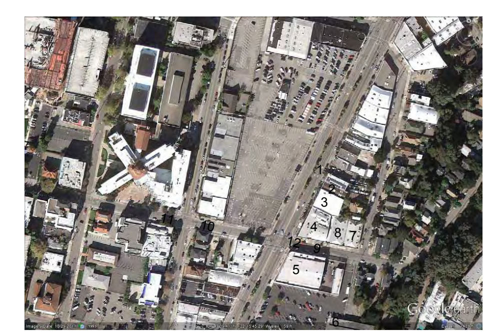
09 - 3000
BROADWAY



10 - 3030 WEBSTER
STREET

11 - 3005 WEBSTER

12 - 2964 BROADWAY



SITE KEY
PLAN

SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 4.1-5

Site Context Photos B

The majority of the buildings around the project site are low-rise, with most ranging between one and four stories. Taller buildings in the area of the project site are the 11-story Broadway Webster Medical Plaza (at Hawthorne and Webster Streets, approximately 1.5 blocks northwest of the project site; see photo #4 in Figure 4.1-3) and the medical office (at 30th and Webster Streets, directly north of the project site; see photo #11 in Figure 4.1-5).

Designated historic buildings also add to the visual interest of the area near the project site. Nearby are the First Presbyterian Church, the Queen Anne-style mixed use building at 29th and Broadway (approximately one block south of the project site), and the two flat-iron buildings at 28th and Broadway (two blocks south of the project site) and Piedmont Avenue and Broadway (two blocks north of the project site).

Views of the Project Area and Scenic Resources

Due to the built urban environment and relatively flat topography, short-range views of the project vicinity (those less than 0.25 mile from the area) are limited to surrounding streets. Short-range views are also available to motorists and others traveling along Broadway and other smaller streets throughout the vicinity, as well as to motorists traveling along the elevated I-580. The topography and intervening development obscure significant or notable mid- and long-range views of project vicinity (approximately 0.5 mile from the area).

Several representative views of the project vicinity were considered. The selected viewpoints were chosen because they provide clear visual access to the project site. Viewpoints considered but rejected include views southward from the Mountain View Cemetery, and views from 27th Street east of Broadway. It was determined that the Project would scarcely be perceptible from those viewpoints because the project vicinity was too far away and/or obscured from view.

Photo #1 in Figure 4.1-2, and photo #3 in Figure 4.1-3, show that views along Broadway in this area are dominated by the wide expanse of the asphalt right-of-way and the prominence of the structures on either side of the roadway. In general, views of auto-related uses are typical throughout the project vicinity, both in the form of surface parking lots and other types of auto-related commercial uses enclosed in commercial and light industrial buildings (see photos #1, #3 and #9 in Figure 4.1-4, and photos #5, #6 and #8 in Figure 4.1-5). These views lack any distinctive or unique visual characteristics and instead convey a fairly generic urban landscape with the aforementioned focus on the automobile.

Views eastward and northward from the project vicinity include intermittent views of the Oakland Hills (see photo #4 in Figure 4.1-3). In particular, although not a view considered under CEQA since they are not public views addressed under the significance criteria (discussed further in this section), views are available across the project site from the residential units in the Oakland Healthcare and Wellness Center, which is a residential health facility. Overall, view corridors through the area provide limited views of protected scenic resources, as identified in the City's General Plan (see Policy OS-10.1 below). Although I-580 is a designated scenic highway (discussed below), views from the highway are not characterized as scenic or unique, nor is the project site readily visible from I-580. The I-580 overpass crosses Broadway approximately 20 feet above street grade and is an identifiable element in the visual character of the area.

Light and Glare

The project vicinity is a built-out urban environment that has existing sources of light and glare associated with land uses typical for an urban setting. Light and glare in the area is also associated with commercial uses, in particular a large parking lot for a nearby grocery store (Grocery Outlet) and for outdoor automotive sales that are equipped with 15- to 20-foot pole-mounted lights to illuminate the parked for-sale vehicles (immediately north of the project site). Light and glare are also associated with street lights along Broadway.

4.1.2 Regulatory Setting

Local

City of Oakland General Plan

City of Oakland General Plan policies that pertain to aesthetics relevant to the Project include the following:

Open Space, Conservation and Recreation (OSCAR) Element

- ***Policy OS-4.4*:** Elimination of Blighted Vacant Lots: Discourage property owners from allowing vacant land to become a source of neighborhood blight, particularly in residential areas with large vacant lots.

- ***Policy OS-9.3*:** Gateway Improvements: Enhance neighborhood and city identity by maintaining or creating gateways. Maintain view corridors and enhance a sense of arrival at the major entrances to the city, including freeways, BART lines, and the airport entry. Use public art, landscaping, and signage to create stronger City and neighborhood gateways.

- ***Policy OS-10.1*:** View Protection: Protect the character of existing scenic views in Oakland, paying particular attention to (a) views of the Oakland Hills from the flatlands; (b) views of downtown and Lake Merritt; (c) views of the shoreline; and (d) panoramic views from Skyline Boulevard, Grizzly Peak Road, and other hillside locations.

- ***Policy OS-10.2*:** Minimize Adverse Visual Impacts: Encourage site planning for new development which minimizes adverse visual impacts and take advantage of opportunities for new vistas and scenic enhancement.

- ***Policy OS-10.3*:** Underutilized Visual Resources: Enhance Oakland's underutilized visual resources, including the waterfront, creeks, San Leandro Bay, architecturally significant buildings or landmarks, and major thoroughfares.

Land use and Transportation Element (LUTE)

- ***Policy T6.2*:** Improving Streetscapes: The city should make major efforts to improve the visual quality of streetscapes. Design of the streetscape, particularly in neighborhoods and commercial centers, should be pedestrian-oriented and include lighting, directional signs, trees, benches, and other support facilities.

- ***Policy D2.1*****:** Enhancing the Downtown: Downtown development should be visually interesting, harmonize with its surroundings, respect and enhance important views in and of the downtown, respect the character, history, and pedestrian-orientation of the downtown, and contribute to an attractive skyline.

Scenic Highways Element

The entire length of MacArthur Freeway (I-580) within Alameda County is identified as part of the Caltrans Scenic Highways Program. It is approximately 500 feet (four blocks) north of the project site, but the site is not directly visible from I-580 (California Department of Transportation, 2013). Policies within the City's Scenic Highways Element aim to limit signage and visual intrusions and protect panoramic vistas along scenic corridors, and to ensure that new construction within scenic corridors demonstrate "architectural merit" and are "harmonious" with the surrounding landscape (City of Oakland, 1974).

Broadway/MacArthur/San Pablo Redevelopment Plan

The Project falls within the Broadway/MacArthur/San Pablo Redevelopment Plan area, the general goal of which is to eliminate blight. The majority of goals and objectives outlined within this plan do not directly pertain to aesthetics, aside from requiring conformity with existing City sign ordinances and design review standards (see Oakland Planning Code, below). Also, as stated in the plan, "One of the objectives of this Plan is to create an attractive and pleasant environment in the Project Area."

Oakland Planning Code

The designs of new projects in Oakland are subject to performance criteria that are utilized as part of the City's design review process. These criteria address projects relative to the surrounding visual character, as well as public and private investments in the area. Projects are evaluated based on site, landscaping, height, bulk, arrangement, texture, materials, colors, appurtenances, and other characteristics. Conformance with the Oakland General Plan and any other design guidelines or criteria is also considered.

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

The City's SCA that directly pertain to reducing aesthetics impacts and that apply to the development of the Project are listed below. If the Project is approved by the City, all applicable SCAs would be adopted as conditions of approval and required, as applicable, of the development of the Project to help ensure no significant impacts occur to aesthetic resources. Because the conditions of approval are incorporated as part of the Project, they are not listed as mitigation measures.

- **AES SCA 1: Lighting Plan**

  Prior to the issuance of an electrical or building permit. The proposed lighting fixtures shall be adequately shielded to a point below the light bulb and reflector and that prevent unnecessary glare onto adjacent properties. Plans shall be submitted to the Planning and Zoning Division and the Electrical Services Division of the Public Works Agency for review and approval. All lighting shall be architecturally integrated into the site.

4.1.3 Impacts and Mitigation Measures

Significance Criteria

The Project would have a significant impact on the environment if it were to:

1. Have a substantial adverse effect on a public scenic vista;

2. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, located within a state or locally designated scenic highway;

3. Substantially degrade the existing visual character or quality of the site and its surroundings;

4. Create a new source of substantial light or glare which would substantially and adversely affect day or nighttime views in the area;

5. Introduce landscape that would now or in the future cast substantial shadows on existing solar collectors (in conflict with California Public Resource Code Section 25980-25986);

6. Cast shadow that substantially impairs the function of a building using passive solar heat collection, solar collectors for hot water heating, or photovoltaic solar collectors;

7. Cast shadow that substantially impairs the beneficial use of any public or quasi-public park, lawn, garden, or open space;

8. Cast shadow on an historic resource, as defined by CEQA Section 15064.5(a), such that the shadow would materially impair the resource's historic significance by materially altering those physical characteristics of the resource that convey its historical significance <u>and</u> that justify its inclusion on or eligibility for listing in the National Register of Historic Places, California Register of Historical Resources, Local register of historical resources, or a historical resource survey form (DPR Form 523) with a rating of 1-5;

9. Require an exception (variance) to the policies and regulations in the General Plan, Planning Code, or Uniform Building Code, and the exception causes a fundamental conflict with policies and regulations in the General Plan, Planning Code, and Uniform Building Code addressing the provision of adequate light related to appropriate uses; or

10. Create winds exceeding 36 mph for more than one hour during daylight hours during the year. The wind analysis only needs to be done if the project's height is 100 feet or greater (measured to the roof) and one of the following conditions exist: (a) the project is located adjacent to a substantial water body (i.e., Oakland Estuary, Lake Merritt or San Francisco Bay); or (b) the project is located in Downtown.

Approach to Analysis

Based on the characteristics of the Project and the existing conditions, the Project would not result in impacts related to the following topics for the reasons discussed below. No detailed impact discussion is provided for these topics for the following reasons:

1. ***Cast shadow on solar collectors; on public or quasi-public park, lawn, garden, or open space; or on an historic resource, as defined by CEQA Section 15064.5(a) (Criteria 5 through 8).*** Shadow conditions within the project area are typical of shadow conditions in built-out urban environments. There are a number of relatively taller buildings (six to 11 stories) that are medical office buildings on Pill Hill to the west and northwest. Along Broadway near the project site, the buildings are primarily one to two stories. Moreover, there are no public open spaces or historic resources located in proximity to the project site that could be adversely affected by shadow cast by the approximately 24-foot Project building (which would extend up to 40 feet only with the appurtenances on the Broadway frontage side of the building (see Figure 3-4, Elevations, in Chapter 3, *Project Description*).

2. ***Require an exception (variance) that causes a fundamental conflict the policies in regulations and the provision of adequate light (Criterion 9).*** While the City's significance thresholds do not address shading of private residences (unless they are an historic resource or involve a variance), the residences in the residential health facility (Oakland Healthcare and Wellness Center) immediately west of the project site currently benefit from the expanse of undeveloped area on the project site and northward - nearly the full length of that building and further northward. The Project would be one building story in height, and no more than five feet taller than the residential building at any point along the building. However, (as discussed in Chapter 3, *Project Description*) the applicant has requested a variance for a building height less than the minimum allowed and to reduce the required setback along the Broadway frontage of the building to accommodate the proposed plaza. However, if granted, these exceptions would not adversely affect the provision of adequate light to any surrounding uses.

3. ***Create winds hazards (Criterion 10).*** The Project would not exceed 100 feet in height therefore the project would not create wind hazards or requires an analysis of such.

Impacts

Scenic Vistas and Scenic Resources

Impact AES-1: The Project would not adversely affect scenic public vistas or views of scenic resources (Criteria 1 and 2). (Less than Significant)

The Project would not be expected to block or otherwise adversely affect scenic views or scenic resources. As stated in the Environmental Setting of this section, the project vicinity is a built-up urban area with relatively flat topography - allowing for short-range views of and within the project vicinity (those less than 0.25 mile from the area) that are limited to surrounding streets. The area is generally limited terms of scenic views.

Some points along the Broadway corridor offer long-range views northward toward the Oakland-Berkeley Hills, a protected scenic resource. However, most views are a vista within the context of the existing intervening development, and the I-580 overpass can interrupt any full view of the hills from certain vantage points (see photo #1 in Figure 4.1-2).

Topography slopes steeply upward along 30th Street to Pill Hill to the west. Views from this higher elevation, as well as from the adjacent residential health facility, can include existing mature trees that extend above the buildings east of Broadway (see photo #4 in Figure 4.1-3). While neither the City's significance thresholds nor CEQA address the effects on views from private residences, this assessment acknowledges the urban views from the residences abutting the project site. Intervening development limits the consideration of these views as scenic resources. The Project would not adversely affect such views given its proposed height of primarily 24 feet (up to 40 feet only with the appurtenances on the Broadway frontage).

The Project would be built within existing property lines and would not be expected to visually obstruct existing view corridors along City streets. Moreover, the Project is specifically intended to fill in the gaps in the street wall along Broadway to achieve a more cohesive overall appearance in the Broadway Auto Row area.

Figures 4.1-6 and **4.1-7** include visual simulations from representative viewpoints were prepared to illustrate possible changes to short-range views as a result of the Project. The simulation in Figure 4.1-6 (bottom image) illustrates a view looking north along Broadway from one-half block south of the project site. As shown, the Project would visibly change how Broadway is perceived from this vantage point (discussed in the assessment of *Visual Character* under Impact AES-2, below), and such change would not represent a substantial adverse effect on views, since no views are considered scenic or unique (as defined by CEQA) and no visual access to protected scenic resources (as defined by the General Plan) would be obstructed. Furthermore, the new structures would create a more consistent street wall and add visual interest at the street level, enhancing the public views experienced by individuals traveling Broadway. Similarly, the simulation in Figure 4.1-7 (bottom image) illustrates a view looking southwestward along Broadway, just north of the project site.

The top image demonstrates that there are no views considered scenic or unique, and no visual access to protected scenic resources looking this direction. The views are short-range and capture close-in development. Lastly, the Project would be required to adhere to the General Plan policies and SCAs described in the Regulatory Setting and that are pertinent to new commercial uses and the protection of important aesthetic resources. This would further ensure that the Project's potential impact to public scenic views and vistas would be less than significant. The Project would not adversely affect scenic public vistas or views of protected scenic resources.

Mitigation: None required.

Existing

With Project

SOURCE: Lowney Architecture

Figure 4.1-6
Existing and Simulated Views

Existing

With Project

SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 4.1-7

Existing and Simulated Views

Visual Character

Impact AES-2: The Project would not substantially degrade the existing visual character or quality of the site and its surroundings (Criterion 3). (Less than Significant)

The Project would dominate the foreground from the vantage points in Figures 4.1-6 and 4.1-7 and visibly change how Broadway is perceived from these vantage points. As shown, the Broadway corners of the building would be built to the property line – introducing an urban frontage along the project site. Portions of the new building would be set back from Broadway, and the area would be landscaped and appointed with amenities to support new active public spaces. The building would be comparable in height to nearby existing buildings on Broadway and 30th Street (see Figure 4.1-6) and would add to the existing variable nature of building designs in the vicinity. Figure 3-8, Key 3D Views, in Chapter 3, *Project Description*, offer close-in illustrations of the proposed building and the combination of exterior materials (corrugated metal, concrete masonry block, terra cotta cladding, reclaimed wood) and variations in open areas, building massing and details such as large overhangs and a "step up" in elevation from the public sidewalk level (via two to three stairs) to create a modern, inviting building and outdoor spaces that are not out of character visually with existing surroundings and that fit with the high-traffic thoroughfare.

The Project would introduce active retail uses and undertake a number of public realm improvements, such as sidewalk widening and improvements, new street trees and lighting, and new public seating areas, would promote active street frontages. Together, these changes and element would result in smaller-scaled, more pedestrian-focused streets, improve the physical appearance, and would create visual interest at the street level. The removal of the expansive surface lot and private driveways that currently contribute to the overall uninviting pedestrian environment of the project area (see Section 4.9, *Land Use, Plans and Policies*) also means the Project would strengthen the overall dense urban look and feel in the area, consistent with General Plan goals as well as the vision stated in the *Broadway Valdez District Specific Plan Draft Concept Plan* (discussed below in Impact AES-4, and initially in Section 4.9, *Land Use, Plans and Policies*, in the EIR). Taken together, the Project could be considered to have a beneficial effect on the visual character of the area.

The Project would be consistent with existing General Plan policies and must comply with the AES SCA requiring a lighting plan and described in the Regulatory Setting, above. It would also be required to obtain City design review approval, which would ensure the Project's contribution to a cohesive architectural style and form and urban fabric in the vicinity. For all these reasons, the Project would not be expected to degrade the visual character of the project area, and in fact would result in a beneficial effect. The impact would be less than significant.

Mitigation: None required.

Light and Glare

Impact AES-3: The Project would result in new sources of light or glare which would not substantially and adversely affect day or nighttime views in the area (Criterion 4). (Less than Significant)

The Project would create new sources of light or glare, but these new sources would be consistent with the existing light and glare conditions in the area. As previously discussed under *Approach to Analysis*, these included uses typical urban commercial uses, including street lights and large parking lots, specifically for a nearby grocery store (Grocery Outlet) and for outdoor automotive sales that are equipped with 15- to 20-foot pole-mounted lights to illuminate the parked for-sale vehicles (immediately north of the project site). The surface parking lot and associated flood lighting on the project site would be replaced with a retail building that would involve ground level lighting associated with the retail uses as well as lighting on the upper level parking deck.

New lighting on and within the Project would serve functional and aesthetics purposes. Building lighting would occur within the upper-level parking deck, within the retail spaces, as well as lighting cast on new retail signage along the street frontages. A lighting study was prepared for the roof deck of the Project (ALR, 2013). The model, specification, height and spacing of the light poles and standards have been selected specifically to avoid light spillage beyond the Project building. Lighting on the upper-level parking deck (see Figure 3-5 in Chapter 3, *Project Description*) specifically would involve four back-to-back, 20-foot tall light poles spaced 90 feet apart on the roof deck, centered on the parking deck. The poles would be located at least 63 feet away from the edge of the roof deck and approximately 103 feet away from the west property line where residential uses exist. These four poles would light the entire roof deck and not spill light beyond the deck's edge. No overhead lighting is proposed. The Project also proposes lighting on the ramp up to the roof deck, which would involve wall mounted lighting that faces away from the west property line (and inside the building wall).

The proposed exterior building materials (discussed in Impact AES-2) do not include reflective surfaces that would result in glare; glazing on the glass frontages of the retail uses would be typical of that found in urban retail settings and would only occur at the ground level.

Overall, the Project is not expected to change or affect day or nighttime views as a result of increased light or glare to a significant extent. The Project would be subject to standard project review and design review and approval processes as required by the City of Oakland and would be required to implement AES SCA 1, *Lighting Plan,* which would minimize potential impacts resulting from lighting and ensure that lighting and glare effects remain less than significant.

Mitigation: None required.

Cumulative Impacts

Impact AES-4: The Project, in combination with other past, present, and reasonably foreseeable future projects within and around the project vicinity, would result in less-than-significant cumulative aesthetics effects. (Less than Significant)

Geographic Context

The cumulative geographic context includes the immediate project vicinity, viewsheds visible within and across the broader area, and the local area surrounding the project site surrounding areas potentially affected by the combination of the Project with other cumulative development in the area.

Impacts

When combined with other cumulative development in and around the project vicinity (as discussed in Section 4.07.2, *Cumulative Context*, at the beginning of Chapter 4 of this Draft EIR), the cumulative effects would not result in a significant adverse aesthetics impact. This is because of past, present and future developments' adherence to the General Plan policies and SCAs described earlier in the Regulatory Setting, as well as compliance with conditions and requirements (including project modifications) identified through the City's design review and environmental review processes, when applicable, to address or mitigate adverse effects related to light and glare, views, and visual character. Present and reasonably foreseeable development would be generally consistent with adopted plans and the overall vision of the City for this area.

As discussed in Section 4.9, *Land Use, Plans and Policies*, further in this Chapter 4, the City is currently preparing a vision and planning framework for future growth and development in an approximately 95.5-acre area that includes the project site: the BVDSP Area. The *BVDSP Draft Concept Plan* indicates the potential for future development in the specific plan area of up to 2.4 million square feet of mixed commercial, retail, offices and restaurant and professional services uses. According to the *Draft Concept Plan*, new buildings could extend up to four- to six stories, with the potential for taller buildings set back from Broadway (City of Oakland, 2011). This potential future growth development is part of the cumulative context, which would improve the overall visual quality of the area by developing new high-quality development pursuant to specific design guidelines and public realm improvements. The Project would contribute to this beneficial condition.

Overall, although the effect of cumulative development may change the overall aesthetic character of the area of the Project and surrounding neighborhoods, it would not be expected to be adverse and result in significant cumulative impacts for the reasons discussed above and throughout this analysis. The impact related to aesthetics would be less than significant.

Mitigation: None required.

4.1.4 References

Associated Lighting Representatives, Inc. (ALR) 2013. *30th & Broadway – Roof Parking, Oakland California.* June 3, 2013.

California Department of Transportation, 2013. The California Scenic Highway System, http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm, accessed February 18, 2013.

City of Oakland, 1974. *General Plan*, *Scenic Highways Element*, adopted September 1974.

City of Oakland, 1996. *General Plan, Open Space, Conservation and Recreation (OSCAR) Element*, June 1996.

City of Oakland, 1998. *General Plan, Land Use and Transportation Element (LUTE)*, March 24, 1998, as amended.

City of Oakland, 2010. Planning Code, Section 17.136.050, *Design Review Procedure,* April 15, 2010.

City of Oakland, 2011. *Draft Concept Plan – Broadway Valdez District Specific Plan.* December 1, 2011.

4.2 Air Quality

This section presents an overview of information related to air quality, including a description of current air quality conditions in the project vicinity. The impact analysis discusses the expected emissions associated with the construction and operation of the Project, evaluates potential effects on sensitive receptors in the vicinity, and includes appropriate City Standard Conditions of Approval (SCAs). Mitigation measures are identified for significant effects, followed by identification of the residual impact significance after mitigation measures are implemented.

4.2.1 Environmental Setting for Air Quality

Climate and Meteorology

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The project vicinity is located in the City of Oakland and is within the boundaries of the San Francisco Bay Area Air Basin. The Bay Area Air Basin encompasses the nine-county region including all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin and Napa counties, and the southern portions of Solano and Sonoma counties. The climate of the Bay Area is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the West Coast of North America. During winter, the Pacific high-pressure system shifts southward, allowing more storms to pass through the region. During summer and early fall, when few storms pass through the region, emissions generated within the Bay Area can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants, such as ozone and secondary particulates, such as nitrates and sulfates.

More specifically, the project vicinity lies approximately two miles east of San Francisco Bay in the Northern Alameda and Western Contra Costa Counties climatological subregion. This subregion extends from Richmond to San Leandro with San Francisco Bay as its western boundary, and its eastern boundary defined by the Oakland-Berkeley Hills. In this area, marine air traveling through the Golden Gate, as well as across San Francisco and the San Bruno Gap (a gap in the Coastal Range between the ocean and the San Francisco Airport), is a dominant weather factor. The Oakland-Berkeley Hills cause the westerly flow of air to split off to the north and south of Oakland, which causes diminished wind speeds. The air pollution potential in this subregion is relatively low for portions close to the Bay, due to the largely good ventilation and less influx of pollutants from upwind sources (BAAQMD, 2012).

Wind measurements taken at Oakland International Airport indicate that the predominant wind flow is out of the west-northwest. Northwest winds occur approximately 46 percent of the time. Average wind speeds vary from season to season with the strongest average winds occurring during summer and the lightest average winds during winter. Average wind speeds are 9.7 miles per hour (mph) during summer and 7.4 mph during winter. Temperatures in Oakland average

58 ^{o}F annually, ranging from an average of 40^{o}F on winter mornings to an average of mid-70s in the late summer afternoons.

Existing Air Quality

The BAAQMD operates a regional monitoring network that measures the ambient concentrations of the six criteria air pollutants. Existing and probable future levels of air quality in Oakland can generally be inferred from ambient air quality measurements conducted by the BAAQMD at its nearby monitoring stations. The monitoring stations closest to the project vicinity are the West Oakland and International Boulevard stations in Oakland, approximately 1.0 mile southwest and 7.3 miles southeast from the project vicinity, respectively. The West Oakland station began monitoring fine particulate matter ($PM_{2.5}$), nitrogen oxides (NO_X), and sulfur dioxide (SO_2) in 2009, ozone (1-hour and 8-hour) in 2010, and the International Boulevard station monitors these same pollutants and for previous years.

Since the major pollutants of concern in the San Francisco Bay Area are ozone and PM, **Table 4.2-1** shows a four-year summary of monitoring data (2009 through 2012) for these pollutants from the West Oakland and International Boulevard stations. Due to the proximity of the Project to the stations in Oakland, air quality measurements gathered in Oakland are understood to be generally representative of conditions within the project vicinity. Table 4.2-1 also compares measured pollutant concentrations with State and national ambient air quality standards (see *Regulatory Setting* below).

Criteria Air Pollutants

Ozone

Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and NO_X. ROG and NO_X are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_X under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Carbon Monoxide (CO)

Ambient CO concentrations normally are considered a local effect and typically correspond closely to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence CO concentrations. Under inversion conditions, CO concentrations may be

TABLE 4.2-1
AIR QUALITY DATA SUMMARY (2008-2012) FOR THE PROJECT VICINITY[a]

Pollutant	State Standard[b]	National Standard[b]	Monitoring Data by Year			
			2009	2010	2011	2012
Ozone hourly						
Highest 1-hour average, ppm[c]	0.09	NA	0.092	0.040	0.057	0.061
Days over State Standard			0[f]	0	0	0
Ozone 8-hour						
Highest 8-hour average, ppm[c]	0.07	0.075	0.062	0.035	0.048	0.048
Days over National Standard			0	0	0	0
Days over State Standard			0	0	0	0
Carbon Monoxide (CO) 8-hour						
Highest 8-hour average, ppm[c]	9.0	9	1.96	1.69	2.65	2.4
Days over National Standard			0	0	0	0
Days over State Standard			0	0	0	0
Nitrogen Dioxide (NO_2)						
Highest 1-hour concentration, ppm[c]	0.18	0.10	0.057	0.069	0.062	0.053
Days over National Standard			0	0	0	0
Days over State Standard			0	0	0	0
Sulfur Dioxide (SO_2)						
Highest 24-hourconcentration, ppm[c]	0.04	0.14	0.005	0.004	0.003	0.008
Days over National Standard			0	0	0	0
Days over State Standard			0	0	0	0
$PM_{2.5}$						
Highest 24-hour average, μg/m3[c]	NA	35	27.9	35.2	43.1	33.6
Estimated days over National Standard[d]			0	0	1	0

a Ozone data for 2009 and $PM_{2.5}$ data from 2012 are from the BAAQMD's International Boulevard station in Oakland; data for 2010, 2011, and 2012 are from the BAAQMD's West Oakland station at 1100 21st Street in Oakland; All other pollutant data are from West Oakland for 2009 through 2011. PM_{10} data was not available near the project site.
b Generally, State standards and national standards are not to be exceeded more than once per year.
c ppm = parts per million; μg/m3 = micrograms per cubic meter.
d Exceedance based on the previous National Standard of 65μg/m3.
e The CARB states that an exceedance is not necessarily a violation.
f A violation occurs only if the standard is exceeded. Because 0.092 rounds to 0.09, it is not considered a violation. A recorded concentration of 0.095 or greater would constitute a violation of the State standard.

NA = Not Available or Not Applicable.

SOURCE: CARB, 2013.

distributed more uniformly over an area that may extend some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses.

CO concentrations have declined dramatically in California due to existing controls and programs and most areas of the state including the project vicinity region have no problem meeting the CO state and federal standards. CO measurements and modeling were important in the early 1980s when CO levels were regularly exceeded throughout California. In more recent years, CO measurements and modeling have not been a priority in most California air districts due to the retirement of older polluting vehicles, fewer emissions from new vehicles, and improvements in fuels. The clear success in reducing CO levels is evident in the first paragraph of the executive summary of the California Air Resources Board (CARB) *2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas* (CARB, 2004), shown below:

> "The dramatic reduction in carbon monoxide (CO) levels across California is one of the biggest success stories in air pollution control. Air Resources Board (ARB or Board) requirements for cleaner vehicles, equipment and fuels have cut peak CO levels in half since 1980, despite growth. All areas of the State designated as non-attainment for the federal 8-hour CO standard in 1991 now attain the standard, including the Los Angeles urbanized area. Even the Calexico area of Imperial County on the congested Mexican border had no violations of the federal CO standard in 2003. Only the South Coast and Calexico continue to violate the more protective State 8-hour CO standard, with declining levels beginning to approach that standard."

Nitrogen Dioxide (NO_2)

NO_2 is a reddish brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO_2. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels.

Nitrogen dioxide is an air quality concern because it acts as a respiratory irritant and is a precursor of ozone. Nitrogen dioxide is a major component of the group of gaseous nitrogen compounds commonly referred to as NO_X. Nitrogen oxides are produced by fuel combustion in motor vehicles, industrial stationary sources (such as industrial activities), ships, aircraft, and rail transit. Typically, nitrogen oxides emitted from fuel combustion are in the form of nitric oxide (NO) and NO_2. NO is often converted to NO_2 when it reacts with ozone or undergoes photochemical reactions in the atmosphere. Therefore, emissions of NO_2 from combustion sources are typically evaluated based on the amount of NO_X emitted from the source.

Sulfur Dioxide (SO_2)

SO_2 is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate, particulate matter, and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

Particulate Matter (PM)

PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively (a micron is one-millionth of a meter). PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Some sources of particulate matter, such as wood burning in fireplaces, demolition, and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and state ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus, are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Recent studies have shown an association between morbidity and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM_{10} and $PM_{2.5}$ because their immune and respiratory systems are still developing.

Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health (Dockery and Pope, 2006).

Lead

Ambient lead concentrations meet both the federal and state standards in the project vicinity. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline products. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. Development of the project vicinity would not introduce any new sources of lead emissions; consequently, lead emissions are not required to be quantified and are not further evaluated in this analysis.

Toxic Air Contaminants (TACs)

Toxic Air Contaminants (TACs) are air pollutants that may lead to serious illness or increased mortality, even when present in relatively low concentrations. Potential human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

TACs do not have ambient air quality standards, but are regulated by the BAAQMD using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis of exposure to toxic substances and human health risks from exposure to toxic substances is estimated, based on the potency of the toxic substances.[1]

[1] A health risk assessment is required for permitting approval if the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk. In these instances, a health risk assessment for the source in question must be prepared. Such an assessment generally evaluates chronic, long-term effects, calculating the increased risk of cancer as a result of exposure to one or more TACs.

The BAAQMD provides a publicly available inventory of TAC-related health risks for permitted stationary sources throughout the San Francisco Bay Area Air Basin as well as for freeways. The most recently updated (May 2012) Google Earth-based inventory of stationary source risks and hazards indicates approximately five permitted TAC sources in the project vicinity. These sources are associated with commercial and hospital uses in the area, such as emergency diesel generators, gasoline dispensing facilities, boilers, as well as automobile service and repair uses. The increased cancer risk values for these sources can vary from less than 0.01 in one million up to 55 in one million, depending on the source. **Table 4.2-2** presents these existing sources and their risk and hazard values. Risk and hazard values are at the fence line of the facility.

TABLE 4.2-2
HEALTH IMPACTS FROM STATIONARY SOURCES WITHIN THE PROJECT VICINITY

Source #[a]	Facility Type	Address	Cancer Risk (persons per million)	Chronic Hazard Impact	$PM_{2.5}$ Concentration (μg/m3)
7780	Alta Bates Medical Center	3100 Summit Street	168.67	0.061	0.662
7781	Alta Bates Medical Center	350 Hawthorne Avenue	276.25	0.099	1.750
		Highest Source Impact	276.25	0.099	1.750

[a] BAAQMD also reports the following facilities as permitted stationary sources in the project area, but reports no associated risks: Alta Bates Medical Center, 450 30thStreet (#3676); Autotrends, 2840 Broadway (#15483); and Collision Service Center of Oakland, 295 29th Street (#15919).

SOURCE: BAAQMD, 2012 and ESA, 2013.

Odorous Emissions

The CEQA Guidelines recommends that odor impacts be considered for any proposed new odor sources located near existing receptors, as well as any new sensitive receptors located near existing odor sources. Generally, increasing the distance between the receptor and the source would mitigate odor impacts.

The BAAQMD provides examples of odor sources which include wastewater treatments plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries and chemical plants. Few odor sources currently exist in the project vicinity, however, most of the project vicinity is within maximum buffer areas delineated in accordance with the BAAQMD factors.

In accordance with the recommendations in the BAAQMD Guidelines, the City mapped known odor sources within its jurisdiction. The project vicinity is located within the boundary of the BAAQMD-recommended two-mile buffer zone of a chemical manufacturing plant. The project vicinity is not within the BAAQMD-recommended one-mile buffer zone of greenwaste/recycling or food processing facilities nor within the BAAQMD-recommended two-mile buffer zone of the EBMUD Waste Treatment Facility located in West Oakland (City of Oakland, 2010).

Sensitive Land Uses

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions source, or duration of exposure to air pollutants. Land uses such as schools, children's day care centers, hospitals, and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress and other air quality-related health problems. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions.

The BAAQMD specifically defines sensitive receptors as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals and residential areas. The project vicinity consists of a mixture of mix of health-related institutional, automotive sales and service, and commercial entertainment and dining uses. Abutting the west boundary of the site is the Oakland Healthcare and Wellness Center, which is a residential skilled nursing facility for the elderly. Just beyond the skilled nursing facility to the west and northwest is "Pill Hill," which includes the Alta Bates Summit Medical Center and other medical-related offices within an approximately 15-square-block area (20 acres) that extends to Telegraph Avenue.

To the east, across and fronting Broadway, are the 3000 Broadway Bar and Restaurant, and a mix of commercial uses (automotive sales and services, plumbing/heating and trenching services, and automotive rental). East of the Broadway frontage (along Brook Street) are additional auto-related uses and single- and multifamily residences throughout the Richmond Avenue neighborhood, as close as 400 feet from the project site.

4.2.2 Regulatory Setting

Federal

Ambient Air Quality Standards

The Federal Clean Air Act (FCAA) requires the U.S. Environmental Protection Agency (USEPA) to identify National Ambient Air Quality Standards (NAAQS or "national standards") to protect public health and welfare. National standards have been established for ozone, CO, NO_2, SO_2, respirable particulate matter (PM_{10} and $PM_{2.5}$), and lead. Pursuant to the 1990 FCAA amendments, the USEPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutants, based on whether or not the NAAQS had been achieved.

Table 4.2-3 shows current national and State ambient air quality standards and provides a brief discussion of the related health effects and principal sources for each pollutant. **Table 4.2-4** shows the current attainment status in the project vicinity.

TABLE 4.2-3
STATE AND NATIONAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	---	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when ROG and NOx react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
	8 hours	0.07 ppm	0.075 ppm		
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Classified as a chemical asphyxiant, CO interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm		
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	0.100 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	Annual Avg.	0.030	0.053 ppm		
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	.075 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	3 hours	---	0.5 ppm		
	24 hours	0.04 ppm	0.14 ppm		
	Annual Avg.	---	0.03 ppm		
Respirable Particulate Matter (PM_{10})	24 hours	50 $\mu g/m^3$	150 $\mu g/m^3$	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Avg.	20 $\mu g/m^3$	---		
Fine Particulate Matter ($PM_{2.5}$)	24 hours	---	35 $\mu g/m^3$	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.
	Annual Avg.	12 $\mu g/m^3$	15 $\mu g/m^3$		
Lead	30-Day Avg.	1.5 $\mu g/m^3$	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Calendar Quarter	---	1.5 $\mu g/m^3$		
	Rolling 3-Month Avg.		.15 $\mu g/m^3$		
Hydrogen Sulfide	1 hour	0.03 ppm	No National Standard	Geothermal Power Plants, Petroleum Production and refining	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations)
Sulfates	24 hour	25 $\mu g/m^3$	No National Standard	Produced by the reaction in the air of SO2.	Breathing difficulties, aggravates asthma, reduced visibility
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	No National Standard	Reduces visibility, reduced airport safety, lower real estate value, discourages tourism.	See $PM_{2.5}$

ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.

SOURCE: California Air Resources Board, 2012, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

TABLE 4.2-4
BAY AREA ATTAINMENT STATUS

Pollutant	Designation/Classification: Federal Standards	Designation/Classification: State Standards
Ozone – one hour	No Federal Standard[1]	Nonattainment
Ozone – eight hour	Nonattainment	Nonattainment
PM_{10}	Unclassified	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Maintenance	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	No Designation	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified

1 Federal One Hour Ozone National Ambient Air Quality Standard was revoked on June 15, 2005.
2 The State 8-hour ozone standard was approved by the CARB on April 28, 2005, and became effective May 17, 2006.

SOURCE: BAAQMD, 2012.

The FCAA requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The FCAA amendments added requirements for states containing areas that violate the NAAQS to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The USEPA has responsibility to review all state SIPs to determine if they conform to the mandates of the FCAA amendments and will achieve air quality goals when implemented. If the USEPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan for the nonattainment area and may impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated timeframes can result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

Toxic Air Contaminants

Regulation of TACs termed Hazardous Air Pollutants (HAPs) under federal regulations, is achieved through federal, State and local controls on individual sources. The 1977 FCAA amendments required the USEPA to identify National Emission Standards for Hazardous Air Pollutants (NESHAPs) to protect public health and welfare. These substances include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. There is uncertainty in the precise degree of hazard.

State

CARB manages air quality, regulates mobile emissions sources, and oversees the activities of county Air Pollution Control Districts and regional Air Quality Management Districts. CARB establishes state ambient air quality standards and vehicle emissions standards.

Ambient Air Quality Standards

As shown in Tables 4.2-1 4.2-3, and 4.2-4, California has adopted ambient standards that are more stringent than the federal standards for the criteria air pollutants and include air quality standards for some pollutants for which there is no corresponding national standard. Under the California Clean Air Act (CCAA) patterned after the FCAA, areas have been designated as attainment or nonattainment with respect to the state standards.

Toxic Air Contaminants

The Health and Safety Code defines TACs as air pollutants which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). A total of 243 substances have been designated TACs under California law; they include the 189 (federal) HAPs adopted in accordance with AB 2728. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. Toxic air contaminant emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment and, if specific thresholds are violated, are required to communicate the results to the public in the form of notices and public meetings.

In August of 1998, CARB identified particulate emissions from diesel-fueled engines (diesel particulate matter, or DPM) as TACs. CARB subsequently developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB, 2000). The document represents proposals to reduce diesel particulate emissions, with the goal of reducing emissions and associated health risks by 75 percent in 2010 and by 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra low sulfur diesel fuel on diesel-fueled engines.

In April 2005, CARB published *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB, 2005). This handbook is intended to give guidance to local governments in the siting of sensitive land uses, such as residences, schools, daycare centers, playgrounds, or medical facilities, near sources of air pollution. There are TAC sources predominantly associated with commercial and office uses located throughout the project vicinity, including, for example, emergency diesel generators, and gasoline dispensing facilities, in addition to freeways and high-volume roadways. Consistent with CARB guidance, the City of Oakland has adopted Standard Conditions of Approval that reduce the impact of TAC sources and sensitive receptors. The proposed Project does not contain either TAC sources or sensitive receptors.

Regional

The regional agency primarily responsible for developing air quality plans for the Bay Area is the Bay Area Air Quality Management District (BAAQMD), the agency with permit authority over most types of stationary emission sources of air pollutants in the Bay Area.

Air Quality Plans

As noted above, the FCAA requires states to prepare SIPs. For states containing areas that violate the NAAQS, regional planning and air pollution control agencies must prepare a regional *Air Quality Plan* to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the Clean Air Act. The 1988 CCAA also requires development of air quality plans and strategies to meet state air quality standards in areas designated as non-attainment (with the exception of areas designated as non-attainment for the state PM standards). Maintenance plans are required for attainment areas that had previously been designated non-attainment in order to ensure continued attainment of the standards.

Bay Area plans are prepared by the BAAQMD with the cooperation of the Metropolitan Transportation Commission and the Association of Bay Area Governments. Currently, there are three plans for the Bay Area. These are:

- The *Ozone Attainment Plan for the 1-Hour National Ozone Standard* developed to meet federal ozone air quality planning requirements. However, the USEPA revoked the 1-hour ozone standard in 2005;
- The *Bay Area 2010 Clean Air Plan* (CAP) developed to meet planning requirements related to the state ozone standard using a multi-pollutant approach(BAAQMD, 2010); and
- The *1996 Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas*, developed by the air districts with jurisdiction over the ten planning areas including the BAAQMD to ensure continued attainment of the federal carbon monoxide standard. In June 1998, the USEPA approved this plan and designated the ten areas as attainment. The maintenance plan was revised most recently in 2004 (CARB, 2004).

The Bay Area addresses all requirements of the national eight-hour standard in the 2010 CAP. For state air quality planning purposes, the Bay Area is classified as a serious non-attainment area for ozone. The “serious” classification triggers various plan submittal requirements and transportation performance standards. One such requirement is that the Bay Area update the CAP every three years to reflect progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emission inventory data. The Bay Area’s record of progress in implementing previous measures must also be reviewed. On September 15, 2010, the BAAQMD adopted the most recent revision to the CAP—the 2010 CAP. The goals of the 2010 CAP are:

- Update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement “all feasible measures” to reduce ozone;

- Consider the impacts of ozone control measures on PM_{10} and $PM_{2.5}$, TACs, and GHGs, in a single, integrated plan;
- Review progress in improving air quality in recent years; and
- Establish emission control measures to be adopted or implemented in the 2009−2012 timeframe.

BAAQMD CEQA Guidelines and Thresholds of Significance

In December 1999, the BAAQMD adopted its *CEQA Guidelines – Assessing the Air Quality Impacts of Projects and Plans*, as a guidance document to provide lead government agencies, consultants, and project proponents with uniform procedures for assessing air quality impacts and preparing the air quality sections of environmental documents for projects subject to CEQA. The *BAAQMD CEQA Guidelines* is an advisory document and local jurisdictions are not required to utilize the methodology outlined therein. The document describes the criteria that the BAAQMD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for use in determining whether projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts.

The BAAQMD updated the 1999 CEQA Air Quality Guidelines in 2010. In May of 2011, the BAAQMD adopted an updated version of its Thresholds of Significance for use in determining the significance of projects' environmental effects under CEQA (Thresholds), and published their CEQA Guidelines for consideration by lead agencies. The Thresholds lowered the previous (1999) thresholds of significance for annual emissions of ROG, NO_X, and PM_{10}, and set a standard for $PM_{2.5}$ and fugitive dust. The 2011 CEQA Guidelines also include methodologies for evaluating risks and hazards for the siting of stationary sources and of sensitive receptors. However, the BAAQMD resolution adopting the significance thresholds in 2010 and 2011 have been set aside by a judicial writ of mandate as of March 5, 2012.

The BAAQMD has subsequently updated its CEQA Air Quality Guidelines in May of 2012 which continue to provide direction on recommended analysis methodologies but no longer recommend quantitative significance thresholds. In the revised Guidelines, the air district recommends that lead agencies develop their own thresholds of significance. The BAAQMD offers, as possibilities, its previous 1999 Guidelines thresholds and also presents a table of thresholds promulgated by other California air districts, as well as a reference to California Air Pollution Control Officers Association and State Air Resources Board guidance. Lead agencies may also reference the BAAQMD CEQA Thresholds Options and Justification Report developed by district staff in 2009. This latter option provides lead agencies with a justification for continuing to rely on the BAAQMD 2011 thresholds. As such, the current City Thresholds for air quality are based upon the BAAQMD 2011 CEQA Guidelines and Thresholds.

Local

City of Oakland General Plan

The Open Space, Conservation and Recreation (OSCAR) Element of the Oakland General Plan contains the following Air Quality objective and policies that would apply to the Project (City of Oakland, 1996).

- ***Objective CO-12: Air Resources:*** To improve air quality in Oakland and the surrounding Bay Region.
- ***Policy CO-12.1:*** Promote land use patterns and densities which help improve regional air quality conditions by: (a) minimizing dependence on single passenger autos; (b) promoting projects which minimize quick auto starts and stops, such as live-work development, mixed use development, and office development with ground floor retail space; (c) separating land uses which are sensitive to pollution from the sources of air pollution; and (d) supporting telecommuting, flexible work hours, and behavioral changes which reduce the percentage of people in Oakland who must drive to work on a daily basis.
- ***Policy CO-12.4:*** Require that development projects be designed in a manner which reduces potential adverse air quality impacts. This may include: (a) the use of vegetation and landscaping to absorb carbon monoxide and to buffer sensitive receptors; (b) the use of low-polluting energy sources and energy conservation measures; and (c) designs which encourage transit use and facilitate bicycle and pedestrian travel.
- ***Policy CO-12.6:*** Require construction, demolition and grading practices which minimize dust emissions.

City of Oakland Municipal Code

Per the City of Oakland Municipal Code, Title 15 Buildings and Construction, Chapter 15.36 Demolition Permits, 15.36.100 Dust Control Measures,

> "Best Management Practices" shall be used throughout all phases of work, including suspension of work, to alleviate or prevent fugitive dust nuisance and the discharge of smoke or any other air contaminants into the atmosphere in such quantity as will violate any city or regional air pollution control rules, regulations, ordinances, or statutes. Water or dust palliatives or combinations of both shall be applied continuously and in sufficient quantity during the performance of work and at other times as required. Dust nuisance shall also be abated by cleaning and sweeping or other means as necessary. A dust control plan may be required as condition of permit issuance or at other times as may be deemed necessary to assure compliance with this section. Failure to control effectively or abate fugitive dust nuisance or the discharge of smoke or any other air contaminants into the atmosphere may result in suspension or revocation of the permit, in addition to any other applicable enforcement actions or remedies (Ord. 12152 Section 1, 1999).

The City of Oakland has implemented Green Building principles in City buildings through the Green Building Guidelines (Resolution No. 79871, 2006) which provides guidelines to Alameda County residents and developers regarding construction and remodeling; and Green Building Education Incentives for private developers.

Standard Conditions of Approval

The City's SCA that directly pertain to air quality and that apply to the development of the Project are listed below. If the Project is approved, all applicable SCAs will be adopted as conditions of approval and required, as applicable, of the Project to help ensure no significant impacts occur regarding construction period dust (or emissions). Because the conditions of approval are incorporated as part of the Project, they are not listed as mitigation measures.

- **AQ SCA 1: Construction-Related Air Pollution Controls (Dust and Equipment Emissions)**

  Ongoing throughout demolition, grading, and/or construction. During construction, the project applicant shall require the construction contractor to implement all of the following applicable measures recommended by the BAAQMD:

  a) Water all exposed surfaces of active construction areas at least twice daily (using reclaimed water if possible). Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water should be used whenever possible.

  b) Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer).

  c) All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

  d) Pave all roadways, driveways, sidewalks, etc. as soon as feasible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.

  e) Enclose, cover, water twice daily or apply (non-toxic) soil stabilizers to exposed stockpiles (dirt, sand, etc.).

  f) Limit vehicle speeds on unpaved roads to 15 miles per hour.

  g) Idling times on all diesel-fueled commercial vehicles over 10,000 lbs. shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485, of the California Code of Regulations). Clear signage to this effect shall be provided for construction workers at all access points.

  h) Idling times on all diesel-fueled off-road vehicles over 25 horsepower shall be minimized either by shutting equipment off when not is use or reducing the maximum idling time to five minutes and fleet operators must develop a written idling policy (as required by Title 13, Section 2449 of the California Code of Regulations.)

  i) All construction equipment shall be maintained and properly tuned in accordance with the manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

  j) Post a publicly visible sign that includes the contractor's name and telephone number to contact regarding dust complaints. When contacted, the contractor shall respond and take corrective action within 48 hours. The telephone numbers of contacts at the

City and the BAAQMD shall also be visible. This information may be posted on other required on-site signage.

k) All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.

l) All excavation, grading, and demolition activities shall be suspended when average wind speeds exceed 20 mph.

m) Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

n) Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for one month or more).

o) Designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holidays and weekend periods when work may not be in progress.

p) Install appropriate wind breaks (e.g., trees, fences) on the windward side(s) of actively disturbed areas of the construction site to minimize wind blown dust. Wind breaks must have a maximum 50 percent air porosity.

q) Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.

r) The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.

s) All trucks and equipment, including tires, shall be washed off prior to leaving the site.

t) Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.

u) Minimize the idling time of diesel-powered construction equipment to two minutes.

v) All equipment to be used on the construction site and subject to the requirements of Title 13, Section 2449 of the California Code of Regulations ("California Air Resources Board Off-Road Diesel Regulations") must meet Emissions and Performance Requirements one year in advance of any fleet deadlines. The project applicant shall provide written documentation that the fleet requirements have been met.

w) Use low VOC (i.e., ROG) coatings beyond the local requirements (i.e., BAAQMD Regulation 8, Rule 3: Architectural Coatings).

x) All construction equipment, diesel trucks, and generators shall be equipped with Best Available Control Technology for emission reductions of NO_X and PM.

y) Off-road heavy diesel engines shall meet the CARB's most recent certification standard.

- **TRANS SCA 1: Parking and Transportation Demand Management**

  This Standard Condition of Approval, which affects air quality emissions, applies to the Project because it would generate 50 or more net new AM or PM peak-hour vehicle trips, and is stated in full in the assessment of traffic in Section 4.12, *Transportation and Circulation*.

4.2.3 Impacts and Mitigation Measures

Significance Criteria

The Project would have a significant air quality impact if it were to:[2]

Project-Level Impacts

1. During Project construction result in average daily emissions of 54 pounds per day of ROG, NO_X, or $PM_{2.5}$ or 82 pounds per day of PM_{10};

2. During Project operation result in average daily emissions of 54 pounds per day of ROG, NO_X, or $PM_{2.5}$ or 82 pounds per day of PM_{10}; or result in maximum annual emissions of 10 tons per year of ROG, NO_X, or $PM_{2.5}$ or 15 tons per year of PM_{10};

3. Contribute to carbon monoxide (CO) concentrations exceeding the California Ambient Air Quality Standards (CAAQS) of nine parts per million (ppm) averaged over eight hours and 20 ppm for one hour [**NOTE**: Pursuant to BAAQMD CEQA Guidelines, localized CO concentrations should be estimated for projects in which (a) project-generated traffic would conflict with an applicable congestion management program established by the county congestion management agency or (b) project-generated traffic would increase traffic volumes at affected intersections to more than 44,000 vehicles per hour (or 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited, such as tunnels, parking garages, bridge underpasses, natural or urban street canyons, and below-grade roadways). In Oakland, only the MacArthur Maze portion of Interstate 580 exceeds the 44,000 vehicles per hour screening criteria.];

4. During either Project construction or operation, expose persons by siting a new source or a new sensitive receptor to substantial levels of Toxic Air Contaminants (TACs) resulting in (a) a cancer risk level greater than 10 in one million, (b) a non-cancer risk (chronic or acute) hazard index greater than 1.0, or (c) an increase of annual average $PM_{2.5}$ of greater than 0.3 micrograms per cubic meter [**NOTE**: Pursuant to the BAAQMD CEQA Guidelines, when siting new TAC sources consider receptors located within 1,000 feet, and when siting new sensitive receptors consider TAC sources located within 1,000 feet including, but not limited to, stationary sources, freeways, major roadways (10,000 or greater vehicles per day), truck distribution centers, ports, and rail lines. For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, and medical centers.]; or

5. Frequently and for a substantial duration, create or expose sensitive receptors to substantial objectionable odors affecting a substantial number of people [**NOTE**: For this threshold,

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2 Except for impacts related to TACs (Significance Criteria 4) and odors (Significance Criteria 5), air quality impacts are, by their nature, cumulative impacts because one project by itself cannot generate air pollution that would violate regional air quality standards. Significance Criteria1 through 3 pertain to a project's contribution to cumulative impacts but are labeled "Project- Level Impacts" here to be consistent with the terminology used by the BAAQMD.

sensitive receptors include residential uses, schools, daycare centers, nursing homes, and medical centers (but not parks)].

Project-Level Cumulative Impacts

6. During either Project operation or construction expose persons, by siting a new source or a new sensitive receptor, to substantial levels of TACs resulting in (a) a cancer risk level greater than 100 in a million, (b) a non-cancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 micrograms per cubic meter [**NOTE**: The cumulative analysis should consider the combined risk from all existing and reasonably foreseeable future sources].

Approach to Analysis

The analysis of potential air quality impacts uses project-level methodology identified by the BAAQMD, the regional agency primarily responsible for developing air quality plans for the Bay Area, including the City of Oakland. This methodology is outlined in the BAAQMD document *California Environmental Quality Act Air Quality Guidelines* (BAAQMD, 2012).

CEQA requires the analysis of potential adverse effects of a project on the environment. Potential effects of the environment on a project are legally not required to be analyzed or mitigated under CEQA. However, this EIR nevertheless analyzes potential effects of "the environment on the project" in order to provide information to the public and decision-makers. Where a potential significant effect of the environment on the project is identified, the document, as appropriate, identifies City Standard Conditions of Approval and/or project-specific non-CEQA recommendations to address these issues.

Impacts

Project-Level Impacts

Impact AIR-1: Construction of the Project would not result in average daily emissions of 54 pounds per day of ROG, NO_X, or $PM_{2.5}$ or 82 pounds per day of PM_{10}. (Criterion 1) (Less than Significant)

Project-related construction would generate air emissions through the use of heavy-duty construction equipment, from vehicle trips hauling materials, and from construction workers traveling to and from the project site. Mobile source emissions, primarily NO_X, would be generated from the use of construction equipment such as excavators, wheeled loaders, and cranes. During the finishing phase, paving operations and the application of asphalt, architectural coatings (i.e., paints) and other building materials would release ROG. The assessment of construction air quality impacts considers each of these sources, and recognizes that construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and for dust, the prevailing weather conditions.

Project implementation is expected to occur over the course of approximately one year. As a conservative analysis, construction activities are assumed to occur over a default construction period calculated by the CalEEMod land use emissions model based on an estimate of construction phases and types of construction equipment as provided by the applicant. This assumed construction period occurs over the course of 2014.

Project construction emissions were estimated using the CalEEMod land use emissions model, which separates the construction process into stages: demolition, site preparation, excavation/ grading, building construction, paving, and architectural coating. The grading phase is separated into emissions from fugitive dust, emissions from off-road equipment, and worker vehicle trips. The paving phase estimates emissions from off-road equipment, on-road trucks worker vehicle trips, as well as off-gassing of ROG emissions from asphalt (primarily parking lot and roadway surfaces).[3] Emissions from the structural building phase would consist of off-road equipment emissions, worker vehicle trips and vendor vehicle trips. The construction duration for each stage and scenario are detailed in CalEEMod printout sheets, which are included in **Appendix C** to this EIR.

Daily construction-related criteria pollutant emissions resulting from the Project are presented in **Table 4.2-5**. Emissions represent average daily emissions, derived from the CalEEMod annual emissions output, and updated to reflect the latest emission factors from CARB's 2011 Inventory Model for In-use Off-road Equipment.

TABLE 4.2-5
AVERAGE DAILY CONSTRUCTION-RELATED EMISSIONS

	Average Daily Construction Emissions (lb/day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Demolition, Site Preparation, Grading, and Building Construction, Paving, and Architectural Coating	12.48	31.21	4.22	4.22
Threshold	54	54	82	54
Exceeds Threshold?	No	No	No	No

SOURCE: ESA, 2013.

ROG emissions estimated in Table 4.2-5 were adjusted to account for reduced ROG content of architectural coatings under Regulation 8, Rule 3 of the BAAQMD and the requirements of the 2010 Green Building Code (also contained in AQ SCA 1, *Construction-related Air Pollution Controls*). All emissions would be below the City of Oakland's significance thresholds for construction emissions. Consequently, there would be a less than significant impact with regard to average daily construction emissions. Further, AQ SCA 1 would implement the BAAQMD Best Management Practices for fugitive dust control and would be required for all construction activities within the project vicinity.

Mitigation: None required.

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3 "Off gassing" refers to the release of gaseous compounds from a solid material such as asphalt.

Impact AIR-2: The Project would not result in operational average daily emissions of more than 54 pounds per day of ROG, NO_X, or $PM_{2.5}$ or 82 pounds per day of PM_{10}; or result in maximum annual emissions of 10 tons per year of ROG, NO_X, or $PM_{2.5}$ or 15 tons per year of PM_{10}. (Criterion 2) (Less than Significant)

The Project would result in an increase in criteria air pollutant and precursor emissions, including ROG, NO_X, PM_{10} and $PM_{2.5}$ from a variety of emissions sources, including onsite area sources (e.g., natural gas combustion for space and water heating, landscape maintenance, use of consumer products, etc.) and mobile on-road sources. Mobile on-road sources are responsible for the majority of these emissions. Exhaust emissions from on-road vehicle traffic associated with the Project were calculated by using the CalEEMod land use emissions model program.

The transportation analysis estimates that the Project would result in approximately 3,385 net new vehicle trips per day after accounting for use of transit, bicycling, walking and pass-by trips. Trip lengths for commercial customer trips were adjusted to be consistent with assumptions for other recent and similar developments within Oakland and to reflect the presence of numerous similar commercial uses in proximity to the project site. CalEEMod printout sheets detailing the average trip length assumed for each trip type, and research supporting these assumptions, is provided in Appendix C.

Under the City's SCA's, a Transportation Demand Management (TDM) plan would be developed and implemented for the proposed Project because it would generate 50 or more net new AM or PM peak-hour vehicle trips.

Table 4.2-6 summarizes average daily mobile and onsite area emissions of criteria pollutants that would be generated by the Project at full build-out (2015). It compares these emissions with City of Oakland significance thresholds. As indicated in Table 4.2-6, development-related operational emissions of ROG, NO_X, and PM_{10} would not exceed the significance thresholds. Consequently, no mitigation measures are required.

TABLE 4.2-6
AVERAGE DAILY OPERATIONAL EMISSIONS 2015

	Average Daily Operational Emissions (lb/day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Area Sources	0.91	0.00	0.00	0.00
Energy Sources	0.40	0.36	0.03	0.03
Mobile Sources	8.66	17.40	6.85	0.67
Total Emissions	**9.61**	**17.76**	**6.88**	**0.70**
Threshold	54	54	82	54
Exceeds Threshold?	No	No	No	No

SOURCE: ESA, 2013.

Table 4.2-7 summarizes maximum annual mobile and onsite area emissions of criteria pollutants that would be generated by the Project at full build-out (2015). It compares these emissions with City of Oakland significance thresholds. As indicated in Table 4.2-7, Project operational emissions of ROG, NO_X, and PM_{10}, would not exceed the City of Oakland significance thresholds. Consequently, mitigation measures are not required.

TABLE 4.2-7
MAXIMUM ANNUAL OPERATIONAL EMISSIONS

	Maximum Annual Operational Emissions (ton/year)			
	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Area Sources	0.17	0.00	0.00	0.00
Energy Sources	0.01	0.07	0.00	0.00
Mobile Sources	1.47	3.15	0.08	0.12
Total Emissions	**1.65**	**3.22**	**0.08**	**0.12**
Threshold	10	10	15	10
Exceeds Threshold?	No	No	No	No

SOURCE: ESA, 2013.

Mitigation: None required.

Impact AIR-3: The Project would not contribute to carbon monoxide (CO) concentrations exceeding the California Ambient Air Quality Standards (CAAQS) of nine parts per million (ppm) averaged over eight hours and 20 ppm for one hour. (Criterion 3) (Less than Significant)

Pursuant to BAAQMD CEQA Guidelines, localized CO concentrations should be estimated for projects in which (a) project-generated traffic would conflict with an applicable congestion management program established by the county congestion management agency or (b) project-generated traffic would increase traffic volumes at affected intersections to more than 44,000 vehicles per hour (or 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited, such as tunnels, parking garages, bridge underpasses, natural or urban street canyons, and below-grade roadways). In Oakland, only the MacArthur Maze portion of Interstate 580 exceeds the 44,000 vehicles per hour screening criteria. Further, ambient CO standards have not been exceeded in the Bay Area for over a decade, largely due to reformulated fuels in California. The Project neither conflicts with any congestion management programs nor generates traffic volumes to more than 44,000 vehicles per hour (or 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited). Therefore, the Project would not be required to estimate localized CO concentrations as it would not contribute to CO concentrations exceeding CAAQS. The impact would be less than significant.

Mitigation: None required.

Impact AIR-4: The Project would not expose persons to substantial levels of Toxic Air Contaminants (TACs) resulting in (a) a cancer risk level greater than 10 in one million, (b) a non-cancer risk (chronic or acute) hazard index greater than 1.0, or (c) an increase of annual average $PM_{2.5}$ of greater than 0.3 micrograms per cubic meter by siting a new source or a new sensitive receptor. (Criterion 4) (Less than Significant)

Pursuant to the BAAQMD CEQA Guidelines, when siting new TAC sources, receptors located within 1,000 feet should be considered. Similarly, when siting new sensitive receptors, TAC sources located within 1,000 feet including, but not limited to, stationary sources, freeways, major roadways (10,000 or greater vehicles per day), truck distribution centers, ports, and rail lines, should be considered. For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, and medical centers.

Operational Impacts from New Project Sources on Existing Receptors

The Project would not require a back-up diesel generator or any other source of TAC emissions. Consequently, there would be less than significant impact with regard to exposure of existing sensitive receptors to risks and hazards from new sources of TAC's.

Operational Impacts of Existing Sources on New Receptors

The Project is entirely retail in nature and would not develop a use that would be considered a sensitive receptor with regard to risks and hazards from TAC's or $PM_{2.5}$. Consequently, the Project would have a less than significant impact with regard to risk and hazard impacts to new sensitive receptors.

Construction Source Impacts on Existing Receptors

Construction equipment generates both onsite and offsite emissions. This analysis focuses primarily on the Project's onsite emissions and the effects that those emissions could have on nearby sensitive receptors, including residences and residents of the adjacent Oakland Healthcare and Wellness Center. The primary TAC of concern from construction is diesel particulate matter (DPM). The ISCST3 model was used to estimate the Project construction emissions.[4] During construction (2014), the Project would generate approximately 0.44 tons of on-site DPM emissions. Inhalation exposure to DPM represents both a carcinogenic and a chronic health risk.

The ISCST3 modeling results show that the Project would result in a maximum health risk of 6.9 in one million, which is below the City of Oakland's threshold of 10 in one million. It should be noted that these risk values were determined based on a conservative modeling analysis, and actual risks would likely be lower. The modeling results also indicated that the Project would result in a maximum chronic hazard index of 0.027, which is below the City of Oakland's hazard index significance index of 1.0. DPM does not pose acute health risks based on OEHHA guidance. Therefore, the Project would not result in carcinogenic, chronic, or acute health risk associated with DPM generated during construction.

4 The ISCST3 model was used in lieu of AERMOD because the BAAQMD has not yet developed AERMOD meteorological data for this location. Meteorological data for ISCST3 was provided by BAAQMD (Cordova, Jim. BAAQMD meteorologist. June 10, 2013 e-mail regarding availability of meteorological data for ISCST3).

The Project would also generate $PM_{2.5}$ emissions during construction. Average annual $PM_{2.5}$ concentrations were modeled using ISCST3. The model results show that the Project would result in maximum annual $PM_{2.5}$ concentrations of 0.14 micrograms per cubic meter ($\mu g/m^3$), which is less than the City of Oakland's $PM_{2.5}$ significance threshold of 0.3 $\mu g/m^3$. Consequently, the Project would not result in a $PM_{2.5}$ health hazard from construction activities.

Mitigation: None required.

Impact AIR-5: The Project would not frequently and for a substantial duration, create or expose sensitive receptors to substantial objectionable odors affecting a substantial number of people. (Criterion 5) (Less than Significant)

The BAAQMD 2012 Guidelines identify wastewater treatment plants, oil refineries, asphalt plants, chemical manufacturing, painting/coating operations, coffee roasters, food processing facilities, recycling operations and metal smelters as odor sources of particular concern, and recommends buffer zones of one to two miles around them to avoid potential odor conflicts. However, these odor sources do not exist within the project vicinity. Further, the Project is entirely retail in nature and would not develop a use that would either create substantial objectionable odors or be considered a sensitive receptor with regard to odors.

In accordance with the recommendations in the BAAQMD Guidelines, the City of Oakland created a map of known odor sources including: food processing facilities; coffee roasters; chemical manufacturers; asphalt batch plants; and the East Bay Municipal Utility District wastewater treatment facility (City of Oakland, 2010). This map presents a reasonable estimation of all the odor sources of concern within the City of Oakland, based upon City's business tax records of the industry categories identified by the BAAQMD. In addition, buffer zones were drawn around the identified sites, based on the aforementioned BAAQMD criteria. There is a chemical plant, located at 1696 West Grand Avenue, whose two-mile buffer radius overlaps the project vicinity. The two-mile odor buffer areas are considered a maximum screening distance for odor impacts from a particular source. All odor impacts from the source would be expected to occur within these buffers, but the actual area of impact within the buffer is dependent on certain factors including source type, frequency of odor generation, intensity of odor, wind direction, and sensitivity of the receptors. BAAQMD was contacted regarding the odor history of this facility. No odor complaints have been filed for the past three years (Rochelle, 2013).

Northwest winds occur 46 percent of the time in the Oakland area. Given the location of the project site relative to the odor source and wind direction, and given that the Project would not result in new sensitive receptors with regard to odors, the Project would not expose sensitive receptors to substantial objectionable odors affecting a substantial number of people and the impact would be less than significant.

Mitigation: None required.

Project-Level Cumulative Impacts

Impact AIR-6: The Project would not expose persons, by siting a new source or a new sensitive receptor, to substantial levels of TACs resulting in (a) a cumulative cancer risk level greater than 100 in a million, (b) a cumulative non-cancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 micrograms per cubic meter. (Criterion 6) (Less than Significant)

As discussed in Impact AIR-4, the Project would be composed entirely of retail land uses and would not include new sensitive receptors. Nor would the Project result in a new source of toxic air contaminants. Consequently, the only potential for cumulative TAC and localized $PM_{2.5}$ impacts would be the result of construction-related emissions of the Project combining with construction-related emissions of other projects in the vicinity.

Other foreseeable projects within 1,000 feet of the project site include the Alta Bates Medical Center. At present, the exterior construction on the main hospital (at 32nd and Webster Streets) is complete and is about 1,000 feet from closest property line of the project site. However, a future phase of construction is expected to occur along Summit Street approximately 700 feet from the project site. The environmental analysis for the Alta Bates Medical Center Master Plan did not include a construction-related health risk assessment and there are no data available with regard to the construction-related health risk impacts of the future phase development. However, construction related emissions of $PM_{2.5}$ (which is predominantly DPM) would be less than those of the Project and at a greater distance from receptors than the Project. Consequently, it is reasonable to assume that the risk and hazard impacts at the nearest receptor would be equal or less than those of the Project (6.9 in one million) and that the combined risks would most certainly be less than the 100 in one million cumulative cancer risk threshold of the City.

As noted in Chapter 3, *Project Description*, the project site is located in the proposed Broadway Valdez Specific Plan (BVDSP) area. Although the current process to develop a Specific Plan for the Broadway Valdez District area is now anticipated to be completed in late 2013, adoption of and development under the Specific Plan could result in new construction projects within 1,000 feet of the project site. Due to the variable nature of construction activity, the generation of TAC emissions would be temporary, especially considering the short amount of time such equipment is typically within an influential distance that would result in the exposure of sensitive receptors to substantial concentrations. In addition, because no specific projects within 1,000 of the project site are currently proposed for development under the Specific Plan, it is unlikely that the Project's construction period would be concurrent with that of future Specific Plan projects. Further, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities.

Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (CARB, 2005). In addition, AQ SCA 1, which implements all construction-related Best Management Practices and mitigation measures identified by the BAAQMD in its 2012 guidance, would apply to the Project and future Specific Plan projects.

Consequently, it is reasonable to assume that the combined risks of the project construction and construction of other reasonably foreseeable future development would be less than the 100 in one million cumulative cancer risk threshold of the City and the impact would be less-than-significant. **Mitigation:** None required.

Other Cumulative Effects

As previously discussed under *Significance Criteria* in this section, except for impacts related to TACs (Significance Criterion 4, discussed above in Impact AIR-6) and odors (Significance Criterion 5, discussed above in Impact AIR-5), air quality impacts are, by their nature, cumulative impacts because one project by itself cannot generate air pollution that would violate regional air quality standards. Significance Criteria 1 through 3 (Impacts AIR-1 through AIR-3) pertain to a project's contribution to cumulative impacts but are labeled "Project- Level Impacts" in this analysis to be consistent with the terminology used by the BAAQMD.

4.2.4 References

Bay Area Air Quality Management District (BAAQMD), 2010. *Bay Area 2010 Clean Air Plan*, September 15, 2010.

BAAQMD, 2012. CEQA Air Quality Guidelines, http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en, May 2012.

California Air Resources Board (CARB), 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, October 2000.

CARB, 2004. *Revision to the California State Implementation Plan for Carbon Monoxide – Updated Maintenance Plan for Ten Federal Planning Areas*, July 2004.

CARB, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective,* April 2005.

CARB, 2012. *Ambient Air Quality Standards,* available at http://www.arb.ca.gov/research/aaqs/aaqs2.pdf Standards last updated June 26, 2012.

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City of Oakland, 1996. *General Plan, Open Space, Conservation, and Recreation Element (OSCAR),* June 1996.

City of Oakland, 2010. *2007-2014 Housing Element EIR*, Section 3.3, *Air Quality*. August 2010.

Dockery, D. W., and Pope, C.A., III, 2006. *Health Effects of Fine Particulate Air Pollution: Lines that Connect,* Journal Air & Waste Management Association, pp. 709–742, June 2006.

Rochelle, Reed, BAAQMD, Public Record Section, e-mail response to public data request, January 28, 2013.

4.3 Biological Resources

This section identifies the existing biological resources within the project vicinity and analyzes how the Project may affect those resources. This section describes the environmental and regulatory setting relevant to biological resources in the project vicinity including the federal, state, and local regulations pertaining to biological resources within the region. Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary.

4.3.1 Environmental Setting

Regional Setting

The project site is located in the Bay Area-Delta Bioregion, as defined by the State's Natural Communities Conservation Program. This designation identifies the broader ecosystem in which the project site resides. This bioregion extends from the Sacramento and San Joaquin Bioregions to the Pacific Coast (CERES, 2013). The climate is Mediterranean with relatively mild, wet winters and warm, dry summers.

Project Setting

The project site is located in a heavily trafficked and urbanized area within Oakland's Upper Broadway Corridor with an historic emphasis on automotive sales and repair businesses. The project vicinity includes a combination of commercial (highlighting the presence of the auto industry), mixed-use development, residential, and roadways. Due to the paved site and urban nature of the 1.9-acre project site, there is a lack of suitable habitat in and around the project site. Over the years, natural habitats that once occurred on the project site have since shifted towards nearby settings, such as the waterfront along the East Bay shoreline and Lake Merritt. The natural landscape prior to the influx of urban development included a mix of coastal prairie, coastal scrub, and riparian habitats.

Habitat Types within the Project Vicinity

Urban

The project vicinity is urban, saturated with a built environment allowing for no naturally occurring biological communities to currently exist. Features of this setting are made up of structures, roadways, concrete, and asphalt that do not encourage flora or fauna to flourish. Exceptions include weedy plants adapted to harsh conditions, as well as formalized plantings incorporated by city and community organizations. Urban wildlife species in the Oakland area include: common raven (*Corvus corax*), crow (*Corvus corone*), northern mockingbird (*Mimus polyglottos*), raccoon (*Procyon lotor*), Norway rat (*Rattus norvegicus*), Virginia opossum (*Didelphis virginiana*), and white-tailed deer (*Odocoileus virginianus*). On occasion, the following may occur: red-tailed hawks (*Buteo jamaicensis*), Cooper's hawks (*Accipiter cooperi*) and peregrine falcons (*Falco peregrines anatum*) as they all prey on rodents and/or birds found in urban areas. For example, peregrine falcons have been observed roosting on nearby buildings (Lowe, 2010; Nevill, 2007). This species is known to use tall buildings and bridges in highly urbanized areas for nesting, and there are no known peregrine nesting sites in the project vicinity (CDFW, 2013). There are approximately 10 small trees located on the sidewalk along the perimeter of the project site.

Creeks and Riparian

There are no creeks within the project vicinity. The creek closest to the project site is Glen Echo Creek, a channelized stream with mature riparian trees and vegetated banks, which runs north to south approximately 500 feet east of the project site (Basics Environmental, 2012).

Sensitive Natural Communities

Sensitive natural communities are designated as such by various resource agencies, such as California Department of Fish and Wildlife (CDFW), or in local policies and regulation. These communities are generally considered to have important functions or values for wildlife and/or are recognized as declining in extent or distribution and are considered threatened enough to warrant some sort of protection. The California Natural Diversity database (CNDDB) tracks communities it believes to be in need of conservation and these communities are typically considered sensitive for the purposes of California Environmental Quality Act (CEQA) analysis. A CNDDB search of the project site flora and fauna, within the U.S. Geological Survey 7.5-minute topographic quadrangles surrounding Oakland West’s Quadrangle, was performed in preparation of this Draft EIR and the results can be found in **Appendix D**. However, no sensitive natural communities were found within the project site (CDFW, 2013).

Jurisdictional Waters and Wetlands

No formal wetland delineation of the project site has been conducted, and no obvious wetlands or open water habitats are present within the project site or vicinity.

Special-status Species

Special-status species are protected pursuant to federal and/or State of California endangered species laws, or have been designated Species of Special Concern by CDFW. In addition, Section 15380(b) of the CEQA Guidelines provides a definition of rare, endangered or threatened species that are not included in any listing. For purposes of this Draft EIR, special-status species are defined as:

- Plant and wildlife species listed as rare, threatened or endangered under the federal or state endangered species acts;
- Species that are candidates for listing under either federal or state law;
- Species formerly designated by the U.S. Fish and Wildlife Service (USFWS) as Species of Concern or designated by CDFW as Species of Special Concern;
- Species protected by the federal Migratory Bird Treaty Act (16 U.S.C. 703-712); and/or

- Species such as candidate species that may be considered rare or endangered pursuant to Section 15380(b) of the CEQA Guidelines.

Few species within the project vicinity meet the above criteria.

Appendix D provides a comprehensive list of the special-status species that have been documented from, or have potential to occur in, suitable habitat in the project vicinity. These lists include occurrences documented by the CNDDB (CDFW, 2013), the California Native Plant Society (CNPS) Electronic Inventory (CNPS, 2013), and the USFWS database (USFWS, 2013). Based on review of the biological literature of the region, information presented in previous environmental documentation, and an evaluation of the habitat conditions of the project site, most of these species were eliminated from further evaluation because: (1) the project site does not and/or never has provided suitable habitat for the species, or (2) the known range for a particular species is outside of the project vicinity.

The remaining special-status species presented in **Table 4.3-1** include those that are documented as occurring within the project vicinity for which potential habitat (i.e., general habitat types) could occur in the project vicinity. Species for which generally suitable habitat occurs in the vicinity, but that were nonetheless determined to have low potential to occur in the project site, are also listed in Table 4.3-1. This table also provides the rationale for each potential-to-occur determination.

Special-Status Animals

No special-status plant species are expected to occur within the project site. Eight special-status wildlife species were identified in Table 4.3-1 as having potential for occurrence within the project vicinity. Please refer to Table 4.3-1 for a summary of each species' habitat preferences and the rationale for determinations with regard to potential for occurrence within the project site.

Special-Status Plants

No special-status plant species are expected to occur within the project site. Although a number of special-status plant species are identified in Appendix D as occurring within the project vicinity, there are no intact native communities remaining within the project site, and therefore, no suitable habitat for these species is present. Many plant species presented in Appendix D are considered by CNPS (2013) to be extirpated from the project site due to a long-standing history of disturbance.

TABLE 4.3-1
SPECIAL-STATUS SPECIES CONSIDERED

Common Name *Scientific Name*	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential for Occurrence in Project Vicinity**
Species Listed and Proposed for Listing			
ANIMALS			
Birds			
Peregrine falcon *Falco peregrinus anatum*	Delisted FE/ Delisted CE/ Fully Protected	Nests on ledges on cliffs, bridges, and tall buildings. In SF Bay area the species is known to nest on the Bay Bridge and buildings in San Francisco and San Jose. These conditions do not exist on or adjacent to the project site.	**Moderate to High.** This species has been observed foraging and roosting at multiple sites within downtown Oakland (Lowe, 2010; Nevill, 2007; CDFW, 2013). However, there are no known nesting sites for this species in Oakland (CDFW, 2013).
Cooper's hawk *Accipiter cooperii*	--/CDFW WL	Commonly nests in conifers and riparian woodland but also known to nest in large trees in urban areas throughout the East Bay, especially near riparian corridors. These conditions do not exist on or adjacent to the project site.	**Moderate to High.** Known to nest within Lakeside Park, which is nearly one mile southeast of the project site (CDFW, 2013).
Red-shouldered hawk *Buteo lineatus*	--/3503.5	Commonly nests in riparian corridors but becoming increasingly common in urban areas throughout the East Bay, nesting in large trees. These conditions do not exist on or adjacent to the project site.	**Moderate to High.** Fairly common locally in urban areas. May nest within wooded areas of Peralta Park or other parks approximately one mile southeast of the project site.
Red-tailed hawk *Buteo jamaicensis*	--/3503.5	Nests in large oaks and conifers. The Bay Area's most common urban raptor. These conditions do not exist on or adjacent to the project site.	**Moderate to High.** Known to occur in downtown Oakland. May nest within tall trees in the various parks within the project vicinity.
Mammals			
Pallid bat *Antrozous pallidus*	FSC/CSC BLM Sensitive/ WBWG_H	Occurs in various habitats including grasslands, scrubs, woodlands, mixed conifer forests, but it is most common in open, dry habitats with rocky areas for roosting. Day roosts include hollow trees, buildings, caves, crevices, and mines. These conditions do not exist on or adjacent to the project site.	**Low.** Suitable roosting habitat occurs within the parks in the project vicinity and foraging habitat is present over park turfgrass and Lake Merritt, nearly one mile southeast of the project site. May forage and roost near the project vicinity but not expected to breed there.
Silver-haired bat *Lasionycteris noctivagans*	FSC/ WBWG_M	Roost almost exclusively in trees – in natural hollows and bird excavated cavities or under loose bark of large diameter snags. These conditions do not exist on or adjacent to the project site.	**Low.** Suitable roosting habitat occurs within the parks in the project vicinity and foraging habitat is present over park turfgrass and Lake Merritt, nearly one mile southeast of the project site. May forage and roost near the project vicinity but not expected to breed there.
Hoary bat *Lasiurus cinereus*	--/WBWG_M	Prefers open habitats or habitat mosaics, with trees for cover and open areas or habitat edges for feeding. Prefers to roost in dense foliage of medium to large trees. These conditions do not exist on or adjacent to the project site.	**Low.** Suitable roosting habitat occurs within the parks in the project vicinity and foraging habitat is present over park turfgrass and Lake Merritt, nearly one mile southeast of the project site. May forage and roost near the project vicinity but not expected to breed there.

TABLE 4.3-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED

Common Name *Scientific Name*	**Listing Status USFWS/ CDFW/CNPS**	**General Habitat**	**Potential for Occurrence in Plan Area**
Species Listed and Proposed for Listing			
ANIMALS			
Mammals (cont.)			
Big free-tailed bat *Nyctinomops macrotis*	--/CSC/ WBWG_M	Found in habitats such as desert shrub, woodlands, and evergreen forests. Mostly roosts in cliff crevices, but documented in buildings, caves, and tree cavities. These conditions do not exist on or adjacent to the project site.	**Low.** Suitable roosting habitat occurs within the parks in the project vicinity and foraging habitat is present over park turfgrass and Lake Merritt. May forage and roost in the project vicinity but not expected to breed there.

STATUS CODES:

FEDERAL: (U.S. Fish and Wildlife Service)
FE = Listed as Endangered (in danger of extinction) by the Federal Government.
FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the Federal Government.
FP = Proposed for Listing as Endangered or Threatened.
FC = Candidate to become a *proposed* species.
FSC = former Federal Species of Concern. Species so designated as such were listed by the Sacramento USFWS office until 2006 but Sacramento USFWS no longer maintains this list. These species are still considered to be at-risk by other federal and state agencies, as well as various organizations with recognized expertise such as the Audubon Society.

STATE: (California Department of Fish and Wildlife)
CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CSC = California Species of Special Concern
3503.5 = Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls) under section 3503.5 CDFW code.
Fully Protected = California Department of Fish and Wildlife Fully Protected Species
CDFW WL = on CDFW watch list for “Taxa to Watch”

WBWB_M = on the Western Bat Working Group (WBWG) “Medium Priority” list. This designation, made by the WBWG, indicates a level of concern that should warrant closer evaluation, more research, and conservation actions of both the species and possible threats.

WBWB_H = on the Western Bat Working Group (WBWG) “High Priority” list. This designation, made by the WBWG, should result in these species being considered the highest priority for funding, planning, and conservation actions. These species are imperiled or are at high risk of imperilment.

Delisted = Species that were formally federally or state listed as endangered or threatened species.

SOURCES: CDFW, 2011; USFWS, 2013; WBWG 2013.

4.3.2 Regulatory Setting

This subsection briefly describes federal, state, and local regulations, permits, and policies pertaining to biological resources as they apply to the project site.

Federal

Endangered Species Act

The USFWS, which has jurisdiction over plants, wildlife, and most freshwater fish, and the National Marine Fisheries Service (NMFS), which has jurisdiction over anadromous fish, marine fish, and mammals, oversee implementation of the Federal Endangered Species Act (FESA).

Section 7 of the FESA mandates that all federal agencies consult with the USFWS and NMFS to ensure that federal agencies' actions do not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat for listed species. A federal agency is required to consult with USFWS and NMFS if it determines a "may effect" situation will occur in association with the project. The FESA prohibits the "take"[1] of any fish or wildlife species listed as threatened or endangered, including the destruction of habitat that could hinder species recovery.

Under Section 9 of the FESA, the take prohibition applies only to wildlife and fish species. However, Section 9 prohibits acts to remove, cut, dig up, damage, or destroy an endangered plant species in nonfederal areas in knowing violation of any state law or in the course of criminal trespass. Candidate species and species that are proposed or under petition for listing receive no protection under Section 9 of the FESA.

Section 10 of the FESA requires the issuance of an "incidental take" permit before any public or private action may be taken that would potentially harm, harass, injure, kill, capture, collect, or otherwise hurt (i.e., take) any individual of an endangered or threatened species. To offset the take of individuals that may occur incidental to implementation of a proposed project, the permit requires preparation and implementation of a habitat conservation plan that provides for the overall preservation of the affected species through specific mitigation measures.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (16 USC, Section 703, Supplement I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

State

California Endangered Species Act

Under the California Endangered Species Act (CESA), CDFW has the responsibility for maintaining a list of threatened and endangered species (California Fish and Game Code Section 2070). CDFW also maintains a list of "candidate species," which are species formally noticed as being under review for addition to either the list of endangered species or the list of threatened species. In addition, CDFW maintains lists of "species of special concern," which serve as "watch lists." Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species could be present on the project site and determine whether the proposed project could have a potentially significant impact on such species. In addition, CDFW encourages informal consultation on any proposed project that may affect a candidate species.

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1 "Take," as defined in Section 9 of the FESA, is broadly defined to include intentional or accidental "harassment" or "harm" to wildlife. "Harass" is further defined by the USFWS as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, and sheltering. "Harm" is defined as an act which actually kills or injures wildlife. This may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

California Fish and Game Code

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 of the California Fish and Game Code prohibits take, possession, or destruction of any birds in the orders *Falconiformes* (hawks) or *Strigiformes* (owls), or of their nests and eggs.

Fish and Game Code (sections 3511, birds; 4700, mammals; 5050, reptiles and amphibians; and 5515, fish) allows the designation of a species as Fully Protected. This is a greater level of protection than is afforded by the CESA, since such a designation means the listed species cannot be taken at any time.

Bats and other non-game mammals are protected in California. Section 4150 of the Fish and Game Code states that all non-game mammals or parts thereof may not be taken or possessed except as otherwise provided in the code or in accordance with regulations adopted by the commission. Thus, destruction of an occupied, non-breeding bat roost, resulting in the death of bats, or disturbance that causes the loss of a maternity colony of bats (resulting in the death of young), is prohibited.

U.S. Army Corps of Engineers and U.S. Environmental Protection Agency Regulations

The Corps and the U.S. Environmental Protection Agency (USEPA) regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under Section 404 of the Clean Water Act (CWA). Projects that would otherwise result in the placement of dredged or fill material into waters of the United States require a Section 404 permit from the Corps. Some classes of fill activities may be authorized under General or Nationwide permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species (listed or proposed for listing under the FESA). In addition to conditions outlined under each Nationwide Permit, project specific conditions may be required by the Corps as part of the Section 404 permitting process. When a project's activities do not meet the condition for a Nationwide Permit, an Individual Permit may be issued.

Section 401 of the CWA requires an applicant for a Corps permit to obtain state certification that the activity associated with the permit will comply with applicable state effluent limitations and water quality standards. In California, water quality certification, or a waiver, must be obtained from the Regional Water Quality Control Board for both Individual and Nationwide Permits.

State Policies and Regulations

State regulation of activities in waters and wetlands resides primarily with the CDFW and the State Water Resources Control Board. In addition, CDFW is authorized under the California Fish and Wildlife Code, Section 1600-1616, to enter into a Streambed Alteration Agreement with applicants and develop mitigation measures when a proposed project would obstruct the flow or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource including intermittent and ephemeral streams. The State Water Resources Control Board, acting through the nine Regional Water Quality Control Boards, must certify that a U.S. Army Corps of Engineer permit action meets state water quality objectives (CWA, Section 401).

Local

City of Oakland General Plan

The Open Space, Conservation, and Recreation (OSCAR) Element of the City of Oakland General Plan was adopted in 1996. OSCAR policies pertaining to natural resources with potential relevance to the Project include the following:

- ***Policy CO-9.1:*** Protect rare, endangered, and threatened species by conserving and enhancing their habitat and requiring mitigation of potential adverse impacts when development occurs within habitat areas.
- ***Policy CO-11.1:*** Protect wildlife from the hazards of urbanization, including loss of habitat and predation by domestic animals.
- ***Policy CO-11.2:*** Protect and enhance migratory corridors for wildlife. Where such corridors are privately owned, require new development to retain native habitat or take other measures which help sustain local wildlife population and migratory patterns.

The following policy was adopted in the 1998 Land Use and Transportation (LUTE) element of the General Plan LUTE:

- ***Policy W3.3:*** Native plant communities, wildlife habitats, and sensitive habitats should be protected and enhanced.

City of Oakland Tree Ordinance

City of Oakland Tree Preservation and Removal Ordinance (Oakland Municipal Code [OMC] Chapter 12.36) permits removal of protected trees under certain circumstances. To grant a tree removal permit, the City must determine that removal is necessary in order to accomplish one of the following objectives:

- to ensure public health and safety,
- to avoid an unconstitutional taking of property,
- to take reasonable advantage of views,
- to pursue acceptable professional practice of forestry or landscape design, or
- to implement the vegetation management prescriptions in the S-11 site development review zone.

Protected trees include the following:

- *Quercus agrifolia* (California or coast live oak) measuring four inches diameter at breast height (dbh) or larger, and any other tree measuring nine inches dbh or larger except *Eucalyptus* and *Pinus radiata* (Monterey pine); provided, however, that Monterey pine trees on City property and in development-related situations where more than five Monterey pine trees per acre are proposed to be removed are considered to be Protected trees.

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

The SCAs relevant to the biological resources that could be significantly impacted by the Project are listed below. If the Project is approved by the City, all applicable SCAs would be adopted as conditions of approval and required, as applicable, of the Project to help ensure less-than-significant impacts to biological resources. The SCAs are incorporated and required as part of the Project, so they are not listed as mitigation measures.

- **BIO SCA 1: Tree Removal During Breeding Season.**

  Prior to issuance of a tree removal permit. To the extent feasible, removal of any tree and/or other vegetation suitable for nesting of raptors shall not occur during the breeding season of March 15 and August 15. If tree removal must occur during the breeding season, all sites shall be surveyed by a qualified biologist to verify the presence or absence of nesting raptors or other birds. Pre-removal surveys shall be conducted within 15 days prior to start of work from March 15 through May 31, and within 30 days prior to the start of work from June 1 through August 15. The pre-removal surveys shall be submitted to the Planning and Zoning Division and the Tree Services Division of the Public Works Agency. If the survey indicates the potential presences of nesting raptors or other birds, the biologist shall determine an appropriately sized buffer around the nest in which no work will be allowed until the young have successfully fledged. The size of the nest buffer will be determined by the biologist in consultation with the CDFW, and will be based to a large extent on the nesting species and its sensitivity to disturbance. In general, buffer sizes of 200 feet for raptors and 50 feet for other birds should suffice to prevent disturbance to birds nesting in the urban environment, but these buffers may be increased or decreased, as appropriate, depending on the bird species and the level of disturbance anticipated near the nest.

- **BIO SCA 2: Tree Removal Permit.**

  Prior to issuance of a demolition, grading, or building permit. Prior to removal of any protected trees, per the Protected Tree Ordinance, located on the project site or in the public right-of-way adjacent to the project, the project applicant must secure a tree removal permit from the Tree Division of the Public Works Agency, and abide by the conditions of that permit.

- **BIO SCA 3: Tree Replacement Plantings.**

  Prior to issuance of a final inspection of the building permit. Replacement plantings shall be required for erosion control, groundwater replenishment, visual screening and wildlife habitat, and in order to prevent excessive loss of shade, in accordance with the following criteria:

  1) No tree replacement shall be required for the removal of nonnative species, for the removal of trees which is required for the benefit of remaining trees, or where insufficient planting area exists for a mature tree of the species being considered.

2) Replacement tree species shall consist of *Sequoia sempervirens* (Coast Redwood), *Quercus agrifolia* (Coast Live Oak), *Arbutus menziesii* (Madrone), *Aesculus californica (*California Buckeye) or *Umbellularia californica* (California Bay Laurel) or other tree species acceptable to the Tree Services Division.

3) Replacement trees shall be at least of twenty-four (24) inch box size, unless a smaller size is recommended by the arborist, except that three fifteen (15) gallon size trees may be substituted for each twenty-four (24) inch box size tree where appropriate.

4) Minimum planting areas must be available on site as follows:

- For *Sequoia sempervirens*, three hundred fifteen square feet per tree;
- For all other species listed in #2 above, seven hundred (700) square feet per tree.

5) In the event that replacement trees are required but cannot be planted due to site constraints, an in lieu fee as determined by the master fee schedule of the City may be substituted for required replacement plantings, with all such revenues applied toward tree planting in city parks, streets and medians.

6) Plantings shall be installed prior to the issuance of a final inspection of the building permit, subject to seasonal constraints, and shall be maintained by the project applicant until established. The Tree Reviewer of the Tree Division of the Public Works Agency may require a landscape plan showing the replacement planting and the method of irrigation. Any replacement planting which fails to become established within one year of planting shall be replanted at the project applicant’s expense.

4.3.3 Impacts and Mitigation Measures

Significance Criteria

The Project would have a significant impact on the environment if it were to:

1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;

2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS;

3. Have a substantial adverse effect on federally protected wetlands (as defined by Section 404 of the Clean Water Act) or state protected wetlands, through direct removal, filling, hydrological interruption, or other means;

4. Substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

5. Fundamentally conflict with any applicable habitat conservation plan or natural community conservation plan;

6. Fundamentally conflict with the City of Oakland Tree Protection Ordinance (OMC Chapter 12.36) by removal of protected trees under certain circumstances [NOTE: Factors to

be considered in determining significance include the number, type, size, location and condition of (a) the protected trees to be removed and/or impacted by construction and (b) protected trees to remain, with special consideration given to native trees.[2] Protected trees include *Quercus agrifolia* (California or coast live oak) measuring four inches diameter at breast height (dbh) or larger, and any other tree measuring nine inches dbh or larger except eucalyptus and *pinus radiata* (Monterey pine); provided, however, that Monterey pine trees on City property and in development-related situations where more than five Monterey pine trees per acre are proposed to be removed are considered to be protected trees.];

7. Fundamentally conflict with the City of Oakland Creek Protection Ordinance (OMC Chapter 13.16) intended to protect biological resources. Although there are no specific, numeric/quantitative criteria to assess impacts, factors to be considered in determining significance include whether there is substantial degradation of riparian and/or aquatic habitat through: (a) discharging a substantial amount of pollutants into a creek; (b) significantly modifying the natural flow of the water; (c) depositing substantial amounts of new material into a creek or causing substantial bank erosion or instability; or (d) adversely impacting the riparian corridor by significantly altering vegetation or wildlife habitat.

Approach to Analysis

Potential impacts resulting from the Project were evaluated using the following sources:

1) Existing resource information and aerial photographs of the project site and vicinity;

2) Data presented in the CNDDB (CDFW 2013), CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California (CPNS, 2013) for Oakland West, Oakland East, Briones Valley, and Richmond U.S. Geological Survey 7.5-minute topographic quadrangles and USFWS *Official List of Federal Endangered and Threatened Species* for Alameda County (USFWS, 2013) which include the project vicinity;

3) Standard biological references (e.g., field guides);

4) Surveys and environmental documents including specific information on species or habitats found in the project vicinity;

5) Other available literature regarding the natural resources of the area.

Based on the project site and its geographical location, the Project would not result in impacts related to the following criteria. No impact discussion is provided for these topics for the following reasons:

- ***Special Status Species:*** As indicated in Table 4.3-1, there is no potential habitat for special status species on or adjacent to the project site, primarily because no buildings or landscaping/trees or water bodies exist. Moreover, given the existence of urban development, including heavy vehicle traffic along Broadway that has occurred for more than 90 years in the project vicinity, the project site is not a part of an established native resident or migratory wildlife corridor (WRT, 2009). Thus, the Project would not have an impact and is not discussed further in this analysis.

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[2] Oakland Planning Code section 17.158.280(E)(2) states that “Development related” tree removal permits are exempt from CEQA if no single tree to be removed has a dbh of 36 inches or greater **and** the cumulative trunk area of all trees to be removed does not exceed 0.1 percent of the total lot area.

- ***Riparian or Sensitive Natural Community:*** As mentioned above, there are no natural sensitive communities on or adjacent to the project site, primarily because no buildings or landscaping/trees or water bodies exist. Thus, the Project would not have an impact and is not discussed further in this analysis.

- ***Protected Wetlands and City of Oakland Creek Protection Ordinance:*** As mentioned above, no obvious wetlands or open water habitats are present within the project site or vicinity. Glen Echo Creek is located approximately 500 feet from the project site. Further, the project site is a paved parking lot with no buildings or landscaping/trees, thus any change to stormwater flow would be reduced with the Project. Thus, the Project would not have an impact and is not discussed further in this analysis. Also, given the distance of Glen Echo Creek from the project site, the creek would not be impacted by construction at the project site, and there would be no conflict with the City of Oakland's Creek Protection Ordinance (Oakland Municipal Code, Title 13, Chapter 13.16.120). Thus, the Project would not have an impact and is not discussed further in this analysis.

- ***Migratory Wildlife Corridors:*** No aquatic habitats or jurisdictional waters potentially supporting migratory fish or birds are present within or adjacent to the project site. As previously indicated, the characteristics of Glen Echo Creek make it an unlikely location for aquatic resources (WRT, 2009). The project site also does not contain natural vegetation that could connect to other nearby natural habitats to constitute a wildlife corridor. Thus, the Project would not have an impact and is not discussed further in this analysis.

- ***Conservation Plans:*** There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans that apply to the project site. The Specific Plan would complement the City of Oakland's General Plan, LUTE by enhancing parameters for future urban development in an existing context not currently fulfilling its potential. Additionally, the Project would lessen potential impacts to areas protected with habitat and/or natural community conservation plans as it encourages urban growth in an area currently devoid of sensitive natural communities.

Impacts

The project site is located within and immediately adjacent to a fully developed urban environment. The Project is not expected to have direct or indirect impacts on biological resources located within the project vicinity.

Impact BIO-1: The Project would not fundamentally conflict with the City of Oakland Tree Protection Ordinance (Oakland Municipal Code Chapter 12.36) (Criterion 6). (Less than Significant)

There are approximately 10 trees in the right-of-way adjacent to the project site, a few of which may qualify as protected under the City of Oakland Tree Protection Ordinance (Oakland Municipal Code, Title 12, Chapter 12.36). The Project would impact these trees through direct removal. BIO SCA 3, *Tree Replacement Plantings*, requires replacement plantings for impacted protected trees. BIO SCA 3 would be incorporated into the Project and would ensure the impact is less than significant.

Mitigation: None required.

Cumulative Impacts

Impact BIO-2: Construction activity and operations of the Project, in combination with past, present, existing, approved, pending and reasonably foreseeable future projects in the project vicinity, would not result in impacts on special-status species, sensitive habitats, wildlife movement corridors, wetlands, and other waters of the U.S. (Less than Significant)

Geographic Context

The cumulative geographical context for biological resources for the Project consists of the project vicinity, including areas of Glen Echo Creek, Mosswood Park, Adams Park, and Lake Merritt.

Impacts

The cumulative analysis considers the effect of the Project in combination with past, present, existing, approved, pending and reasonably foreseeable future projects within and in the vicinity of the project site (as described in Chapter 4, Section 4.07, Cumulative Analysis, of this EIR). The project site has been previously developed and the project would have no impact on any biological resources.

Incorporation of the City's SCAs relating to erosion control, stormwater management, and hazardous materials (35, *Hazards Best Management Practices;* 55, *Erosion and Sedimentation Control Plan*; 75, *Stormwater Pollution Prevention Plan;* and 80, *Post-construction Stormwater Management Plan*) would ensure indirect impacts to wetland and/or other waters are less than significant. Additionally, incorporation of the City of Oakland's BIO SCA 1, *Tree Removal During Breeding Season;* BIO SCA 2, *Tree Removal Permit; and* BIO SCA 3, *Tree Replacement Plantings;* among other applicable requirements, would also ensure that potential impacts to special status resources are less than significant.

Environmentally protective laws and regulations have been applied with increasing rigor since the early 1970s and include the CESA, FESA, and the CWA, as described earlier in this section. The Project, within the cumulative geographic context, would be required to comply with local, state, and federal laws and policies and all applicable permitting requirements of the regulatory and oversight agencies intended to address potential impacts on biological resources, including waters of the U.S., and special-status species. Additionally, cumulative projects would be required to demonstrate that they would not have significant effects on these biological resources, although it is possible that some projects may be approved even though they would have significant, unavoidable impacts on biological resources.

Therefore, overall, considering the Project with effects of past, present, pending and reasonably foreseeable future projects within the geographic context for this analysis, the cumulative effect on biological resources would be less than significant. Moreover, since the project site is devoid of any natural resources and does not support any sensitive or natural resources and has been completely paved due to past development, the Project would not contribute to any potential cumulative biological resource impacts.

Mitigation: None required.

4.3.4 References

Basics Environmental, 2012. *Phase 1 Environmental Site Assessment 3001-3033 Broadway, Oakland, CA*, September 20, 2012.

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California Native Plant Society (CNPS), 2013. CNPS Electronic Inventory of Rare and Endangered Plants, data request for Oakland West U.S. Geological Survey 7.5-minute topographic quadrangle and surround three quads, online application: http://www.cnps.org/, accessed January 9, 2013.

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City of Oakland, 1998. *General Plan: Land Use and Transportation Element.* March 1998.

Lowe, Martha, 2010. Senior Watershed Ecologist, Environmental Science Associates, personal observation, peregrine falcons observed in downtown Oakland, July 27, 2010

Nevill, G., 2007. Saturday in Oakland, Falcon Hunting, July 14, 2007. Annotated photographs, http://www.raptor-gallery.com/07-14-07/index.htm, accessed January 10, 2013.

United States Fish & Wildlife Service (USFWS), 2013. Official List of Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in Alameda County. Available online: http://ecos.fws.gov/ecos/indexPublic.do, accessed January 5, 2013.

WRT, 2009. *Broadway Valdez District Specific Plan: Existing Conditions Report,* Draft, August 2009.

4.4 Cultural Resources

This section provides relevant background information with respect to cultural resources in the project vicinity. Cultural resources are defined as prehistoric or historic-era archaeological sites, historic architectural resources, and paleontological resources. This section describes the environmental and regulatory setting relevant to cultural resources in the project vicinity, and summarizes the relevant and applicable regulations and policies. Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary.

4.4.1 Environmental Setting

An overview of the history and development of the City of Oakland is contained in the *City of Oakland Historic Preservation Element* (1998; pp. 1-2 through 1-9), and is hereby incorporated by reference. The Oakland City Planning Department's Cultural Heritage Survey project has prepared extensive neighborhood histories, thematic context statements, and individual property and district documentation that can be consulted for further information. The following discussion includes a brief summary of the history of the project vicinity as adapted in part from the *Historic Preservation Element*, as well as the *Broadway Valdez Specific Plan Historic Resources Inventory* (2009, HRI) (ESA, 2009).

Prehistoric Setting

The project vicinity is now urbanized, although prehistorically, it was a biologically rich alluvial plain and estuarine environment between the East Bay Hills and San Francisco Bay. Many of the original surveys of archaeological sites in the Bay region were conducted between 1906 and 1908 by Stanford (and, later, UC Berkeley) archaeologist N.C. Nelson. Such surveys yielded the initial documentation of nearly 425 "earth mounds and shell heaps" along the littoral zone of the Bay (Nelson, 1909).[1] None of these shellmounds are located in the project vicinity; the nearest is approximately 1 mile away south of Lake Merritt. From these beginnings, the most notable sites in the Bay region were excavated scientifically, like the Emeryville shellmound in Emeryville (CA-ALA-309), the Ellis Landing Site (CA-CCO-295) in Richmond, and the Fernandez Site (CA-CCO-259) in Rodeo Valley (Morrato, 1984). Notable dense midden[2] sites near Oakland, such as the Emeryville shellmound (CA-ALA-309), have been carbon 14-dated to be 2310 ± 220 years old, but other evidence from around the Bay suggests that human occupation in the region began earlier, at least by around 5000 B.C. (Davis & Treganza, 1959 as cited in Moratto, 1984). The Windmiller Pattern (c. 2500 B.C. to 1500 B.C.) is characterized by relatively sparse, small sites situated on small knolls above seasonal floodplains on valley floors. Beginning around 2000 B.C., the bayshore and marsh-adapted peoples representing the so-called Berkeley Pattern appeared in the archaeological record. This artifact pattern was represented by minimally-shaped cobble mortars

1 The "littoral zone" is the part of a body of water that is close to the shore.

2 A midden is a mound of domestic refuse generally containing culturally darkened soils, shells and animal bones, as well as other indices of past human life and habitation. Middens mark the site of an indigenous settlement, and may contain human burials related to that settlement.

and pestles, dart and atlatl hunting technology, and a well-developed bone carving industry - traits that diffused throughout the region and spread to the interior areas of central California during this time period.

The late prehistoric period, appearing in the archaeological record as the Augustine Pattern (c. A.D. 1000 until European contact), shows substantial population growth, increased trade and social exchange networks, increased ceremonial activity, and more intensive use of acorns as a staple food in addition to fish, shellfish, and a wide variety of hunted animals and gathered plant resources. Technological changes are shown in the adoption of the bow and arrow for hunting, and use of bone awls for basketry manufacture. The people of this period were the ancestors of the groups encountered by the first Spanish explorers.

Ethnographic Setting

Prior to Euroamerican contact, the Ohlone (also known by their linguistic group, Costanoan[3]) occupied the area that is currently Alameda County. Politically, the Ohlone were organized into sovereign groups that held a defined territory and exercised control over the resources within that territory. Oakland and a large surrounding area of the East Bay are located within the territory; at this time, at least four villages were probably settled within the boundaries of modern Oakland, although the exact locations are now unknown.

Historic Setting

The project site is within the Rancho San Antonio land grant that was granted to Luis Maria Peralta on August 3, 1820 for his service to the Spanish government. The 43,000-acre rancho included the present-day cities of Oakland, Berkeley, Alameda, and parts of San Leandro and Piedmont. The Gold Rush and California statehood brought miners, businessmen, lumbermen and other speculators to the area in search of opportunities. Early settlers of that period who squatted on 480 acres of Vicente Peralta's (one of Luis Peralta's sons) land subsequently hired Julius Kellersberger, an Austrian-educated Swiss military engineer, to plot a new city - Oakland - which was incorporated in 1852.

The 1906 earthquake and fire in San Francisco prompted a population increase in Oakland, and by 1910 the city's population of 150,000 was more than double the 1900 level of 67,000. Older neighborhoods became more densely populated as new apartment buildings and related growth became part of Oakland's residential fabric. The population growth also increased the demand for retail goods, and shopping districts expanded throughout the next decade to meet this demand. The post-earthquake development boom defined much of downtown Oakland as it is known today, resulting in most of the city's notable early 20th century architecture.

3 "Costanoan" is derived from the Spanish word Costaños meaning "coast people." No native name of the Costanoan-speaking people as a whole existed in prehistoric times as the Costanoan language was shared between multiple ethnic groups and political entities. Most modern descendants of Costanoan-speaking peoples prefer to be known as Ohlone, a name derived from one of the tribal groups that occupied the San Gregorio watershed in San Mateo County.

Broadway's Auto Row

Initially owned solely by the wealthy, automobiles became the standard mode of transportation for many Americans of all classes by the 1920s. By 1920 there were 210,000 registered vehicles in Alameda County. The number of automobile showrooms and service facilities that appeared on Broadway in the early 20th century was related to Oakland's role at the forefront of the West Coast's fledgling automobile industry. General Motors founder William C. Durant joined forces with French racecar driver Louis Chevrolet and formed the Chevrolet Motor Car Company. In 1916, a Chevrolet plant opened in East Oakland.

Both San Pablo and Telegraph Avenue were in existence by 1857 as country roads leading north. By 1870, Broadway was extended north of 14th Street -- the original town -- when this outlying area was mainly occupied by agricultural uses. The blocks in the project vicinity were subdivided and built up with medium sized, single family houses by 1903. At the turn of the century, Sanborn maps show Broadway as having been predominantly occupied by residential buildings, as well as associated schools and hospitals. Garages and other associated automobile buildings began appearing along Broadway by 1911, and the auto service area, with sales centers located along Broadway, had developed a strong presence by the 1920s, extending to upper Broadway beyond 20th Street.

Broadway and Telegraph Avenue were major roadways connecting Oakland to Berkeley, and streetcars transported residents and commuters from one community to another until the system was dismantled in 1948. As a major roadway leading out of Oakland, Broadway was the route to the outlying prosperous Piedmont and Rockridge residential areas, whose development owed a great deal to the automobile. By 1912, there were reportedly 4,500 automobiles registered in Oakland, and by the mid-1910s, Upper Broadway was referred to as "Broadway Auto Row." The majority of the buildings located within the 'Broadway Auto Row' were constructed between 1910s and 1940s, and revolved around the growing auto industry. The main building types are identified as Beaux Arts and Moderne automobile showrooms, early 20th century utilitarian service garages, and 1920s decorative brick commercial buildings.

Paleontological Setting

On a regional scale, fossilized plants, animals and microorganisms are prevalent throughout the East Bay Area. Many of the hills in the East Bay are made up of sedimentary bedrock that is known to contain a wide range of fossils, including radiolaria, mollusks, diatoms, foraminifera, and non-marine vertebrates. In addition, even geologically young fluvial deposits have been known to contain freshwater mollusks and extinct late-Pleistocene vertebrate fossils (Graymer, 2000).

The series of stream courses that deposited sediments during the Pleistocene no longer exist, and those ancient sediments have been cut into by modern-day streams. As a result, many of the Pleistocene-age fluvial and alluvial fan deposits exist as subtle topographic highs between the bay margin and the East Bay Hills. The Pleistocene deposits are similar in composition and character to sediments deposited by present-day streams, but owing to their age, they are denser, more consolidated, and have locally preserved the remains of Pleistocene flora and fauna. Ground-disturbing development within Pleistocene-age deposits which underlay portions of the project vicinity could affect previously unrecorded paleontological resources.

4.4.2 Regulatory Setting

National Historic Preservation Act, National Register of Historic Places, and National Historic Landmarks

National Historic Preservation Act and National Register of Historic Places. The National Historic Preservation Act of 1966 as amended (NHPA) addresses those concerns pertinent to the effect of federal actions on cultural resources (16 USC § 470 *et seq*.). The NHPA sets forth the federal government's policy on historic preservation, including establishing the National Register of Historic Places (NRHP, National Register). The National Register is the nation's official list of cultural resources worthy of preservation. Properties listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture.

There are no buildings listed in, or determined eligible for listing in, the National Register on the project site.

National Historic Landmarks. National Historic Landmarks (NHLs) are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States. National Historic Landmarks are given special protection by Section 110(f) of the NHPA.

There are no NHLs on the project site.

California Environmental Quality Act, California Register of Historical Resources, and California State Historical Landmarks

CEQA requires lead agencies in California to consider the effects of proposed actions on historic resources, defined as those resources meeting the criteria for listing on the California Register of Historic Resources (CRHR, California Register). This definition of "historic resources" includes buildings, structures, objects, sites, and districts determined to be eligible for or listed on the California Register, the National Register, or a local register of historic resources. A lead agency may also determine a resource to be significant for purposes of CEQA. Section 15064.5 of CEQA assigns special importance to human remains and specifies procedures to be followed when Native American remains are discovered.

The California Register is an authoritative guide to the state's cultural resources, and provides the standards by which properties are considered significant for CEQA purposes. The California Register program encourages public recognition and protection of resources of architectural, historical, archaeological and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for state historic preservation grant funding and affords certain protections under CEQA. The California Register includes resources listed in or formally determined eligible for listing in the National Register; California State Landmarks; and California Points of Historical Interest. The State Office of Historic Preservation (OHP) maintains a list of historical resources by county in their Directory of Properties in the Historic Property Data File. A building or structure identified in OHP's Directory with a rating of 1 or 2 (on or determined eligible for the National Register) is considered to be "listed" on the California Register. No properties within the project site are listed in or determined eligible for listing in the California Register.

Properties of local significance that have been designated under a local preservation ordinance (i.e., local landmarks), or that have been identified as significant in a local historical resources inventory may also be eligible for listing in the California Register and are presumed to be significant resources for purposes of CEQA.

In order for a resource to meet the criteria for listing in the California Register, it must satisfy all of the following three provisions:

1. It meets one or more of the following four criteria of significance (PRC 5024.1[c] and CEQA Guidelines 15064.5):
   a. the resource "is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;"
   b. the resource "is associated with the lives of persons important in our past;"
   c. the resource "embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values;" or
   d. the resource "has yielded, or may be likely to yield information important in prehistory or history" (this criterion applies primarily to archaeological sites).
2. The resource retains historic integrity; and
3. It is fifty years old or older (except where it can be demonstrated that sufficient time has passed to understand the historical importance of the resource).

California Historical Landmarks are sites, buildings, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. The specific standards now in use were first applied in the designation of Landmark #770. California Historical Landmarks #770 and above are automatically listed in the California Register of Historic Resources.

There is one California Historical Landmark adjacent to the project site: the Saint Mary's College Site (CHL 676), which existed from 1889 to 1928 on what is now 3093 Broadway. This site, however, is not listed in the California Register of Historic Resources, because only those CHL's numbered 770 and higher are automatically listed in this register, and this one has not been separately nominated.

Local Plans and Policies

In the City of Oakland, a historical resource under CEQA is defined by the City's CEQA Thresholds of Significance as a resource that meets any of the following criteria:

1. A resource listed in, or determined to be eligible for listing in, the California Register of Historic Resources;

2. A resource included in Oakland's Local Register of Historical Resources (defined below), unless the preponderance of evidence demonstrates that it is not historically or culturally significant;

3. A resource identified as significant (e.g., rated 1–5) in a historical resource survey recorded on Department of Parks and Recreation Form (DPR) 523, unless the preponderance of evidence demonstrates that it is not historically or culturally significant;

4. Any object, building, structure, site, area, place, record, or manuscript which the Oakland City Council determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the determination is supported by substantial evidence in light of the whole record. Generally, a resource is considered "historically significant" if it meets the criteria for listing on the California Register of Historical Resources CEQA Guidelines Section 15064.5; or

5. A resource that is determined by the City Council to be historically or culturally significant even though it does not meet the other four criteria listed here.

City of Oakland General Plan Historic Preservation Element

In March 1994, the Oakland City Council adopted a Historic Preservation Element (HPE) of the General Plan (amended July 21, 1998), which sets forth goals, objectives, policies, and actions for historic preservation in the City of Oakland. The HPE creates a wide-reaching, multifaceted "Historic Preservation Strategy" that addresses a wide variety of properties and is intended to help revitalize Oakland's districts and neighborhoods. Guiding the HPE are the two broad, ambitious goals at its core:

> **Goal 1:** To use historic preservation to foster the economic vitality and quality of life in Oakland by:
>
> (1) Stressing the positive community attributes expressed by well-maintained older properties;
>
> (2) Maintaining and enhancing throughout the City the historic character, distinct charm, and special sense of place provided by older properties;
>
> (3) Establishing and retaining positive continuity with the past thereby promoting pride, a sense of stability and progress, and positive feelings for the future;
>
> (4) Stabilizing neighborhoods, enhancing property values, conserving housing stock, increasing public and private economic and financial benefits, and promoting tourist trade and interest through preservation and quality maintenance of significant older properties;

(5) Preserving and encouraging a city of varied architectural styles and environmental character reflecting the distinct phases of Oakland's cultural, social, ethnic, economic, political, and architectural history; and

(6) Enriching the quality of human life in its educational, spiritual, social, and cultural dimensions through continued exposure to tangible reminders of the past.

Goal 2: To preserve, protect, enhance, perpetuate, use, and prevent the unnecessary destruction or impairment of properties or physical features of special character or special historic, cultural, educational, architectural or aesthetic interest or value.

Objectives and policies found in the HPE that are relevant to the Project are summarized below. They are relevant to the Project because they provide guidance toward minimizing adverse effects to historic resources, and they have the potential to assist in implementation of beneficial HPE actions. Some of the actions related to these policies have already been completed, while some are ongoing.

Objective 1: Identifying Properties Potentially Warranting Preservation. Policies and actions related to this Objective describe the OCHS rating system, inventory goals and guidelines, and define the various types of Designated Historic Properties as well as Potential Designated Historic Properties (PDHPs).

Objective 2: Preservation Incentives and Regulations for Designated Historic Properties. This objective directs the City to develop a system of preservation incentives and regulations for specially designated significant older properties which (i) enhances economic feasibility for preservation; (ii) provides a predictable and appropriate level of protection, based on each property's importance; (iii) reasonably balances preservation with other concerns; and (iv) operates efficiently, avoiding unnecessary regulatory procedures and review periods.

Objective 3: Historic Preservation and Ongoing City Activities. This objective seeks to establish administrative procedures and criteria to promote preservation of significant older properties as a routine part of City-sponsored or assisted projects, programs and regulatory activities.

Policy 3.1: Avoid or minimize adverse historic preservation impacts related to discretionary City actions. Policy 3.1 is a general policy which is expressed more specifically in this Chapter's other policies and their related actions.

Policy 3.8: Definition of "Local Register of Historic Resources" and historic preservation "Significant Effects" for environmental review purposes. This policy defines the minimum set of historical resources that require consideration in environmental review and declares that complete demolition of a historic resource cannot normally be mitigated to a level of insignificance.

Measures appropriate to mitigate significant effects to a Historical Resource may include one or more of the following measures depending on the extent of the proposed addition or alterations[4]:

4 Per the provisions of CEQA, determination of whether mitigations are adequate to reduce a significant effect o a historical resource to a level less than significant will be determined by the Lead Agency on a case-by-case basis.

1) Modification of the project design to avoid adversely affecting the character defining elements of the property.

2) Relocation of the affected Historical Resource to a location consistent with its historical or architectural character.

If the above measures are not feasible, then other measures may be considered including, but not limited to the following:

3) Modification of the project design to include restoration of the remaining historic character of the property.

4) Modification of the project design to incorporate or replicate elements of the building's original architectural design.

5) Salvage and preservation of significant features and materials of the structure in a local museum or within the new project.

6) Measures to protect the Historical Resource from effects of on-site or other construction activities.

7) Documentation in a Historic American Buildings Survey report or other appropriate format: photographs, oral history, video, etc.

8) Placement of a plaque, commemorative, marker, or artistic or interpretive display on the site providing information on the historical significance of the resource.

9) Contribution to a Facade Improvement Fund, the Historic Preservation Revolving Loan Fund, the Oakland Cultural Heritage Survey, or other program appropriate to the character of the resource.

Objective 4: Archaeological Resources. This objective seeks to develop databases identifying existing and potential archaeological sites and adopt procedures for protecting significant archaeological resources. Related policies and actions describe the measures the City will take to protect significant archaeological resources during ground-disturbing activities associated with discretionary projects.

Objective 5: Information and Education. This objective seeks to provide and encourage informational and educational programs to enhance public and City staff appreciation of older properties and increase the level of technical knowledge. Associated policies and actions promote research and information dissemination programs; public recognition of historic properties and preservation efforts through plaques, certificates, walking tours and guidebooks; City-sponsored design assistance, rehabilitation training and apprenticeship programs, rehabilitation publications, and a preservation-related design and construction bookstore; public school curricula emphasizing Oakland's history and architectural heritage; and improved City records management.

The chapters of the HPE also address identification, incentives, regulations, and preservation in ongoing city activities, and education and information. The HPE sets out a graduated system of ratings and designations based on the Oakland Cultural Heritage Survey information and implemented in the Oakland Planning Code. Incentives and regulations for historic properties are similarly graduated based on the relative importance of the property.

As detailed below, the project vicinity contains three individual properties that meet the definition of the City of Oakland's Local Register, and are considered significant for purposes of environmental review under CEQA. These resources are specified in Table 4.4-1, under Study Results, below.

Oakland Cultural Heritage Survey

The Oakland Cultural Heritage Survey (OCHS) is the City Planning Department's comprehensive city-wide inventory of historic buildings and districts. The project vicinity has been comprehensively researched, evaluated, and documented through intensive and reconnaissance-level surveys between 1985 and 2009. Inclusion of a property in the OCHS has no direct regulatory effect; however, the ratings provide guidance to City staff and property owners in design review, code compliance, and similar ongoing City activities. The intensive survey formal evaluation is based on the following criteria:

1. ***Visual Quality/Design*:** Evaluation of exterior design, interior design, materials and construction, style or type, supporting elements, feelings of association, and importance of designer.

2. ***History/Association:*** Association of person or organization, the importance of any event, association with patterns of history, and the age of the building.

3. ***Context:*** Continuity and familiarity of the building within the city, neighborhood, or district.

4. ***Integrity and Reversibility:*** Evaluation of the building's condition, its exterior and interior alterations, and any structural removals.

Survey ratings describe both the individual building and its neighborhood context. The OCHS rates individual properties using a five-tier rating system, A through F:

A. Highest importance: Of exceptional historical or architectural value, outstanding example, appearing clearly eligible for the National Register.

   There are no A-rated buildings in the broader project vicinity[5].

B. Major importance: Major historical or architectural value, fine example, probably eligible for the National Register.

   There are two B-rated buildings in the broader project vicinity:

   1) *Firestone Tire & Rubber Service Station at 2946-64 Broadway* (one-half block south of the project site, across Broadway)
   2) *Grandjean Burman -GM Co.Alzina garage at 3074 Broadway* (one-half block south of the project site, across Broadway)

   There is one other building (listed below) that is adjacent to the project site that has a proposed B-rating as a result of the reconnaissance-level inventory completed for the

[5] For purposes of this section, "broader project vicinity" is the *Broadway Valdez Specific Plan Historic Resources Inventory* study area (ESA, 2009).

project vicinity in 2009 reported in the 2009 HRI (ESA, 2009). It has a proposed B-rating because it has been restored since it was originally evaluated or it is considered an outstanding example of its type and period.

3) *McConnell GMC Pontiac Cadillac at 3093 Broadway* (immediately north of the project site)

C. Secondary importance: Superior or visually important example, very early, or otherwise noteworthy; these properties "warrant limited recognition" but generally do not appear individually eligible for the National Register (although they may contribute to a district).

There are more than 10,000 C-rated buildings citywide, with approximately 46 located in the broader project vicinity. Many of these buildings are contributors to the four ASIs (Area of Secondary Importance Historic District) in the project vicinity.

D. Minor importance: Typical or representative example of a type, style, convention, or historical pattern. Many "D" and lower-rated properties are Potential Designated Historic Properties (PDHPs), either because they have higher contingency ratings or because they contribute or potentially contribute to a district.

There are more than 25,000 D-rated citywide, with approximately 60 located in the broader project vicinity. Many of these buildings are contributors to the four ASIs in the broader project vicinity (discussed below).

E. Of no particular interest: not representative of any important pattern and visually undistinguished.

There are approximately 22 E-rated buildings in the broader project vicinity.

* or F. Not rated: Too recent to rate or totally modernized. Some of these also have higher contingency ratings.

*There are approximately 23 buildings with * or F-ratings in the broader project vicinity.*

Individual properties are also given a Multiple Property Rating (1, 2, or 3) based on an assessment of the significance of the area in which the property is located. Properties within an Area of Primary Importance (API: areas that appear eligible for the National Register) are rated "1," those located in an Area of Secondary Importance (ASI: likely not eligible for the National Register) are rated "2," and those outside an identified district are rated "3." A plus (+), minus (-), or asterisk (*) symbol indicates respectively whether the property contributes to the API or ASI, does not contribute, or potentially contributes.

There are no APIs in the broader project vicinity.

ASIs are similar to APIs; however, remodeled buildings that are potential contributors to the ASI are counted for purposes of the two-thirds threshold as well as contributors. ASIs do not appear eligible for the National Register, usually because they are less intact than, or not as distinct as APIs. Although contributors to an ASI are not considered 'historic resources' by CEQA per se, they may have local importance that is worthy of recognition in specific planning efforts.

The project site is in the Broadway Auto Row District ASI.

The Broadway Auto Row District ASI is a distinctive early 20th century commercial district of approximately 49 buildings on 53 assessor's parcels. Approximately 34 properties contribute to the district's significance. Most buildings date from the 1910s through 1940s, and main property types are Beaux Arts and Moderne automobile showrooms, early 20th century utilitarian service garages, and 1920s decorative brick commercial buildings. There are no contributory buildings on the project site, although there are approximately 11 contributors located immediately north, east, and south of the project site.

Designated Historic Properties

The Oakland Planning Code currently provides for five types of historic property designations: Oakland Landmarks, S-7 and S-20 Preservation Combining Zones (historic districts), Preservation Study List, and Heritage Properties. It also establishes the Landmarks Preservation Advisory Board (Landmarks Board) to oversee these properties.

There are no designated landmarks or districts within the broader project vicinity.

Potential Designated Historic Properties –PDHPs

Under Policy 1.2 of the HPE, Potential Designated Historic Properties (PDHPs) are any properties that have an OCHS rating of at least a contingency "C," or that contribute or potentially contribute to a primary or secondary district. These properties "warrant consideration for possible preservation." PDHPs are a large group - approximately one-fifth to one-quarter of all buildings in Oakland. They are intended to be numerous enough to "significantly influence the City's character." The inclusion of contingency-rated properties as PDHPs is intended to highlight their value as restoration opportunities. District contributors or potential contributors are classified as PDHPs to promote preservation of Oakland's distinctive neighborhoods.

There are over 100 PDHPs located within the broader project vicinity. Most of these are C- or D-rated buildings which are contributors to the ASI in the broader project vicinity.

While most PDHPs do not appear obviously eligible for the National or California Registers and therefore (in the absence of Heritage Property designation or some other formal action) do not meet the CEQA definition of "historic resources," they are recognized and protected under the HPE for their contribution to the Oakland environment. Chapter 5 of the HPE contains policies and actions for the protection and enhancement of PDHPs.

Local Register of Historical Resources

The HPE provides the following definition of the City of Oakland's Local Register of Historical Resources (Local Register), or properties considered significant for purposes of environmental review under CEQA:

1. All Designated Historic Properties (DHPs - Landmarks, Heritage Properties, Study List Properties, Preservation Districts, and S-7 and S-20 Preservation Combining Zone Properties); and

2. Those Potential Designated Historic Properties (PDHPs) that have an existing rating of "A" or "B," or are located within an Area of Primary Importance (API). An API is a district that appears eligible for the National Register.

In the broader project vicinity there are three individual properties that meet the definition of the City of Oakland's Local Register, and are considered significant for purposes of environmental review under CEQA. These resources are shown in **Table 4.4-1**.

City of Oakland Planning Code

In addition to providing definitions of the four types of Designated Historic Properties (as discussed under *City of Oakland General Plan Historic Preservation Element*), the Planning Code contains specific regulations for projects meeting certain criteria. The Project does not meet any of those certain criteria addressed (e.g., located in a Central Business Zone; involving demolition or removal of a DHP or PDHP; or involving the removal of a historic resource or additions and alterations of historic resources).

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

The City's SCAs relevant to the cultural resources that might be affected by the development of the Project are listed below. If the Project is approved by the City, all applicable SCAs will be adopted as conditions of approval and required, as applicable to help ensure no significant impacts to cultural resources occur. Because the conditions of approval are incorporated as part of the Project, they are not listed as mitigation measures.

- **CUL SCA 1: Archaeological Resources**

  Ongoing throughout demolition, grading, and/or construction

  a. Pursuant to CEQA Guidelines Section 15064.5 (f), "provisions for historical or unique archaeological resources accidentally discovered during construction" should be instituted. Therefore, in the event that any prehistoric or historic subsurface cultural resources are discovered during ground disturbing activities, all work within 50 feet of the resources shall be halted and the project applicant and/or lead agency shall consult with a qualified archaeologist or paleontologist to assess the significance of the find. If any find is determined to be significant, representatives of the project proponent and/or lead agency and the qualified archaeologist would meet to determine the appropriate avoidance measures or other appropriate measure, with the ultimate determination to be made by the City of Oakland. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards.

  b. In considering any suggested measure proposed by the consulting archaeologist in order to mitigate impacts to historical resources or unique archaeological resources, the project applicant shall determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, costs, and other considerations. If avoidance is unnecessary or infeasible, other appropriate measures (e.g., data recovery) shall be instituted. Work may proceed on other parts of the project site while measure for historical resources or unique archaeological resources is carried out.

c. Should an archaeological artifact or feature be discovered on-site during project construction, all activities within a 50-foot radius of the find would be halted until the findings can be fully investigated by a qualified archaeologist to evaluate the find and assess the significance of the find according to the CEQA definition of a historical or unique archaeological resource. If the deposit is determined to be significant, the project applicant and the qualified archaeologist shall meet to determine the appropriate avoidance measures or other appropriate measure, subject to approval by the City of Oakland, which shall assure implementation of appropriate measures recommended by the archaeologist. Should archaeologically-significant materials be recovered, the qualified archaeologist shall recommend appropriate analysis and treatment, and shall prepare a report on the findings for submittal to the Northwest Information Center.

d. Archaeological Resources – Sensitive Areas. *Prior to issuance of a demolition, grading, or building permit***,** the project applicant shall implement either Provision A (Intensive Pre-Construction Study) or Provision D (Construction ALERT Sheet). However, if in either case a high potential presence of historic-period archaeological resources on the project site is indicated, or a potential resource is discovered, the project applicant shall also implement all of the following provisions:

- Provision B (Construction-Period Monitoring),
- Provision C (Avoidance and/or Find Recovery), and
- Provision D (to establish a Construction ALERT Sheet if the Intensive Pre-Construction Study was originally implemented per Provision A, or to update and provide more specificity to the initial Construction ALERT Sheet if a Construction ALERT Sheet was originally implemented per Provision D).

Provision A through Provision D are detailed as follows:

- *Provision A: Intensive Pre-Construction Study* – The project applicant, upon approval from the City Planning and Zoning Division, may choose to complete a site-specific, intensive archaeological resources study prior to soil-disturbing activities occurring on the project site. The purpose of the site-specific, intensive archaeological resources study is to identify early the potential presence of history-period archaeological resources on the project site. If that approach is selected, the study shall be conducted by a qualified archaeologist approved by the City Planning and Zoning Division. If prepared, at a minimum, the study shall include:
  - An intensive cultural resources study of the project site, including subsurface presence/absence studies, of the project site. Field studies conducted by the approved archaeologist(s) may include, but are not limited to, auguring and other common methods used to identify the presence of archaeological resources;
  - A report disseminating the results of this research;
  - Recommendations for any additional measures that could be necessary to mitigate any adverse impacts to recorded and/or inadvertently discovered cultural resources.

  If the results of the study indicate a high potential presence of historic-period archaeological resources on the project site, or a potential resource is discovered, the project applicant shall hire a qualified archaeologist to monitor any ground disturbing activities on the project site during construction (see

Provision B, Construction-Period Monitoring, below), implement avoidance and/or find recovery measures (see Provision C, Avoidance and/or Find Recovery, below), and prepare an ALERT Sheet that details what could potentially be found at the project site (see Provision D, Construction ALERT Sheet, below).

- *Provision B: Construction-Period Monitoring* – Archaeological monitoring would include briefing construction personnel about the type of artifacts that may be present (as referenced in the ALERT Sheet, require per Provision D, Construction ALERT Sheet, below) and the procedures to follow if any are encountered, field recording and sampling in accordance with the Secretary of Interior's *Standards and Guidelines for Archaeological Documentation*, notifying the appropriate officials if human remains or cultural resources are discovered, or preparing a report to document negative findings after construction is completed. If a significant archaeological resource is discovered during the monitoring activities, adherence to Provision C, Avoidance and/or Find Recovery, discussed below), would be required to reduce the impact to less than significant. The project applicant shall hire a qualified archaeologist to monitor all ground-disturbing activities on the project site throughout construction.

- *Provision C: Avoidance and/or Find Recovery* – If a significant archaeological resource is present that could be adversely impacted by the proposed project, the project applicant of the specific project site shall either:

  - Stop work and redesign the proposed project to avoid any adverse impacts on significant archaeological resource(s); or,

  - If avoidance is determined infeasible by the City, design and implement an Archaeological Research Design and Treatment Plan (ARDTP). The project applicant shall hire a qualified archaeologist who shall prepare a draft ARDTP that shall be submitted to the City Planning and Zoning Division for review and approval. The ARDTP is required to identify how the proposed data recovery program would preserve the significant information the archaeological resource is expected to contain. The ARDTP shall identify the scientific/historic research questions applicable to the expected resource, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. The ARDTP shall include the analysis and specify the curation and storage methods. Data recovery, in general, shall be limited to the portions of the archaeological resource that could be impacted by the proposed project. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical. The project applicant shall implement the ARDTP. Because the intent of the ARDTP is to save as much of the archaeological resource as possible, including moving the resource, if feasible, preparation and implementation of the ARDTP would reduce the potential adverse impact to less than significant.

- *Provision D: Construction ALERT Sheet* – The project applicant, upon approval from the City Planning and Zoning Division, may choose to prepare a construction ALERT sheet prior to soil-disturbing activities occurring on the project site, instead of conducting site-specific, intensive archaeological resources pursuant to Provision A, above. The project applicant shall submit for review and approval by the City prior to subsurface construction activity an

"ALERT" sheet prepared by a qualified archaeologist with visuals that depict each type of artifact that could be encountered on the project site. Training by the qualified archaeologist shall be provided to the project's prime contractor; any project subcontractor firms (including demolition, excavation, grading, foundation, and pile driving); and/or utilities firm involved in soil-disturbing activities within the project site.

The ALERT sheet shall state, in addition to the basic archaeological resource protection measures contained in other standard conditions of approval, that in the event of discovery of the following cultural materials, all work must be stopped in the area and the City's Environmental Review Officer contacted to evaluate the find: concentrations of shellfish remains; evidence of fire (ashes, charcoal, burnt earth, fire-cracked rocks); concentrations of bones; recognizable Native American artifacts (arrowheads, shell beads, stone mortars [bowls], humanly shaped rock); building foundation remains; trash pits, privies (outhouse holes); floor remains; wells; concentrations of bottles, broken dishes, shoes, buttons, cut animal bones, hardware, household items, barrels, etc.; thick layers of burned building debris (charcoal, nails, fused glass, burned plaster, burned dishes); wood structural remains (building, ship, wharf); clay roof/floor tiles; stone walls or footings; or gravestones.

Prior to any soil-disturbing activities, each contractor shall be responsible for ensuring that the ALERT sheet is circulated to all field personnel, including machine operators, field crew, pile drivers, and supervisory personnel.

If the project applicant chooses to implement Provision D, Construction ALERT Sheet, and a potential resource is discovered on the project site during ground disturbing activities during construction, the project applicant shall hire a qualified archaeologist to monitor any ground disturbing activities on the project site during construction (see Provision B, Construction-Period Monitoring, above), implement avoidance and/or find recovery measures (see Provision C, Avoidance and/or Find Recovery, above), and prepare an updated ALERT Sheet that addresses the potential resource(s) and other possible resources based on the discovered find found on the project site.

- **CUL SCA 2: Human Remains**

  Ongoing throughout demolition, grading, and/or construction. In the event that human skeletal remains are uncovered at the project site during construction or ground-breaking activities, all work shall immediately halt and the Alameda County Coroner shall be contacted to evaluate the remains, and following the procedures and protocols pursuant to Section 15064.5 (e)(1) of the CEQA Guidelines. If the County Coroner determines that the remains are Native American, the City shall contact the California Native American Heritage Commission (NAHC), pursuant to subdivision (c) of Section 7050.5 of the Health and Safety Code, and all excavation and site preparation activities shall cease within a 50-foot radius of the find until appropriate arrangements are made. If the agencies determine that avoidance is not feasible, then an alternative plan shall be prepared with specific steps and timeframe required to resume construction activities. Monitoring, data recovery, determination of significance and avoidance measures (if applicable) shall be completed expeditiously.

- **CUL SCA 3: Paleontological Resources**

  Ongoing throughout demolition, grading, and/or construction. In the event of an unanticipated discovery of a paleontological resource during construction, excavations within 50 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified paleontologist (per Society of Vertebrate Paleontology standards [SVP 1995,1996[). The qualified paleontologist shall document the discovery as needed, evaluate the potential resource, and assess the significance of the find. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find. If the City determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of the project on the qualities that make the resource important, and such plan shall be implemented. The plan shall be submitted to the City for review and approval.

- **CUL SCA 4: Vibrations Adjacent to Historic Structures**

  Prior to issuance of a demolition, grading or building permit. The project applicant shall retain a structural engineer or other appropriate professional to determine threshold levels of vibration and cracking that could damage the affected historic building(s) and design means and methods of construction that shall be utilized to not exceed the thresholds.

4.4.3 Study Results

Archaeological Resources

A records search of pertinent survey and site data was conducted at the Northwest Information Center (NWIC) of the California Historical Resources Information System on February 13, 2009 (File No. 08-0943) and updated on January 8, 2013 (File No. 12-0661). The records were accessed by utilizing the Oakland West USGS 7.5-minute quadrangle map. The review included the broader project vicinity (the *Broadway Valdez Specific Plan Historic Resources Inventory* study area [ESA, 2009]) and the area within a ½-mile radius. Previous surveys and studies and archaeological site records were accessed as they pertained to the study area. Records were also accessed and reviewed in the *Directory of Properties in the Historic Property Data File for Alameda County* for information on sites of recognized historical significance. Properties listed include the *National Register of Historic Places*, the *California Register of Historical Resources*, the *California Inventory of Historical Resources*, the *California Historical Landmarks,* and the *California Points of Historical Interest*.

The records search indicated that there were no recorded prehistoric or historic-period archaeological sites within a ½-mile radius of the broader project vicinity. The nearest recorded prehistoric archaeological site is approximately 1.0-2.0 miles to the south of the broader project vicinity, nearer to the historic shoreline of the Bay tidal marshland.

Although no historic-period archaeological resources have been recorded in the broader project vicinity, there is a moderate to high potential for historic-period archaeological to be present. As described above, the Saint Mary's College (CHL 676), existed from 1889 to 1928 on what is now 3093 Broadway, immediately adjacent to the Project site. According to National Park Service guidelines, archaeological sites in urban areas "are likely to be more or less invisible, buried under modern created land surfaces" (National Park Service, 1985:36). Archaeology undertaken for various projects in an urban environment (Meyer, 2002; Praetzellis, 2001, 2004) has demonstrated that historic-period archaeological features often survive within two feet of the modern ground surface. These features include pits, privies, wells, and sheet refuse associated with buildings shown on early Sanborn and other maps. Urban archaeological experience has also shown that pits and privies are most often located near the back of house lots, while wells tend to be closer to the rear of the building and can sometimes be located within the footprint of the house itself, typically at a rear or side addition. The significance of these features has been illuminated in numerous urban historical archaeology projects in Oakland (Koenig, et al., 2001; Praetzellis, 2001), San Francisco (Byrd et al., 2010; Ziesing, 2000), San Jose (Allen et al., 1999; Allen et al., 2002), and Sacramento (Praetzellis and Praetzellis, 1988) over the past few decades.

Broadway has been a main thoroughfare in Oakland beginning in 1852. The earliest settlement was nearer to the estuary, but early maps show scattered structures in the project vicinity. The development of the project vicinity that began in the 1910s and 1920s may have destroyed subsurface historic-period archaeological remains; however paved surfaces such as parking lots potentially cap and protect archaeological deposits.

Historic Properties

While the project site contains no historic properties, there is one historic resource adjacent to the site and two others within the project vicinity, listed in **Table 4.4-1**.

TABLE 4.4-1
CEQA HISTORIC RESOURCES WITHIN PROJECT VICINITY

Street Address	Year Built	Historic Name/Current Name	OCHS Rating/Survey Type
2946-64 Broadway	1930	Firestone Tire & Rubber service station/Mercedes Benz of Oakland	Existing B-rating/ Intensive Survey
3074 Broadway	1917	Grandjean Burman GM Co-Alzina garage / Window Tinting Plus	Existing B-rating/ Intensive Survey
3093 Broadway	1947	McConnell GMC Pontiac Cadillac/Bay City Chevrolet	Existing C-rating, proposed B-rating in 2009 Survey/ Intensive Survey

As described in the Regulatory Setting subsection above, the broader project vicinity contains a total of three individual CEQA historic resources with existing or proposed B-ratings, as well as an ASI and approximately 11 individual PDHPs that contribute to the Broadway Auto Row ASI in the immediate project vicinity. These older buildings and the secondary district, while not meeting the technical definition of a historical resource for CEQA purposes will be considered in the review of the proposed Project. They are listed in **Table 4.4-2**.

Paleontological Resources

Aside from the geologic history of the site, documented fossil discoveries can further elaborate on the paleontological potential of the area. The University of California, Museum of Paleontology (UCMP) maintains the world’s largest database of fossil discoveries and collections, with thousands of records for the East Bay. A search of the database by location and age (Quaternary) revealed 72 Pleistocene-age localities and 47 Recent (Holocene) localities within Alameda County. While

TABLE 4.4-2
CONTRIBUTORS TO THE BROADWAY AUTO ROW DISTRICT ASI

Street Address	Year Built	Historic Name/Current Name	OCHS Rating/Survey Type
2946-64 Broadway[a]	1930	Firestone Tire & Rubber service station/Mercedes Benz of Oakland	Existing B-rating/ Intensive Survey
3000 Broadway	1917	Gilpin-Owen-Webb Motor Co. garage/3000 Broadway Restaurant	Existing C-rating/ Intensive Survey
3012-3020 Broadway	1915	Burrows-Hebrank Hunter & Peacock garage	Existing C-rating/ Intensive Survey
3022 Broadway	1922	Lacazette – Thayer - Laugel Glass Co. shop/Roger's Autoworks	Existing D-rating/ Intensive
3040 Broadway	1924	Roberts (E.H.)-Farrow-Kreplin (G.) garage	Existing D-rating/ Intensive
3048-50 Broadway	1921	Prosser (J.L.)-The Brake Shop building	Existing D-rating/ Intensive
3060 Broadway	1915	McDonell Auto Top-Risdon Speedometer shop/Auto Row Smot	Existing C-rating/ Intensive Survey
3068 Broadway	1914	Greuner (W.M.)-Brasch & McKorkle showroom/Precision Motors	Existing D-rating/ Intensive
3074 Broadway[a]	1917	Grandjean Burman GM Co-Alzina garage / Window Tinting Plus	Existing B-rating/ Intensive Survey
3080 Broadway	1915	McClurg (J.A.)-Schwimley-Remmer garage/American Auto Upholstery and Glass	Existing C-rating/ Intensive Survey
3093 Broadway[a]	1947	McConnell GMC Pontiac Cadillac/Bay City Chevrolet	Existing C-rating, proposed B-rating in 2009 Survey/ Intensive Survey

[a] Also a CEQA historic resource, listed in Table 4.4-1.

many of these localities contain no recorded specimens, two localities about one mile from project site report a total of 27 vertebrate fossils from a variety of now-extinct Pleistocene mammals. These were identified during deep excavations for the roadway tunnels connecting the island of Alameda to the mainland. Fourteen invertebrate fossils of Quaternary age were reported from various locations in Oakland, three of which were found in or around Lake Merritt. One plant fossil was also reported in Oakland, although a more specific location could not be determined (UCMP, 2008). Whether or not these fossils were found within the specific geologic units underlying the project site was not able to be determined from the information in the UCMP database.

4.4.4 Impacts and Mitigation Measures

Significance Criteria

A project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment. For purposes of this section, a historical resource is one that meets the City of Oakland's definitions (see above). The fact that a resource is not listed in or formally determined to be eligible for listing in the NRHP, CRHR, or a local register of historical resources, or not deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1 of the Public Resources Code (PRC), shall not preclude the City from determining that the property may be a historical resource for purposes of this EIR.

Specifically, development of the Project would have a significant impact on the environment if it were to:

1. Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section15064.5. Specifically, a substantial adverse change includes physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be "materially impaired." The significance of a historical resource is "materially impaired" when a project demolishes or materially alters, in an adverse manner, those physical characteristics of the resource that convey its historical significance and that justify its inclusion on, or eligibility for inclusion on an historical resource list (including the California Register of Historical Resources, the National Register of Historical Resources, Local Register, or historical resources survey form (DPR Form 523) with a rating of 1-5);
2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section15064.5;
3. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
4. Disturb any human remains, including those interred outside of formal cemeteries.

Approach to Analysis

The project would be subject to the SCAs and the goals and policies of the City's General Plan as outlined above. The approach used to analyze potentially significant impacts of the Project on cultural resources included an evaluation of the applicability of the SCAs for the protection of cultural resources, and identification of additional mitigation measures if such SCAs were deemed insufficient to fully mitigate potentially significant impacts. As direct and indirect impacts to cultural resources typically arise from ground-disturbing activities (excavation for building foundations and utilities), as well as new construction, and demolition and alteration of existing buildings, the potential for such activities to occur as a result of the Project was the focus of the analysis.

Impacts

Historical Resources

Impact CUL-1: The Project would not result in the physical demolition, destruction, relocation, or alteration of historical resources that are listed in or may be eligible for listing in the federal, state, or local registers of historical resources (Criterion 1). (Less than Significant)

As described above, the project vicinity contains three individual properties that are considered historical resources for CEQA purposes. The Project would not adversely affect any of these properties, as it would construct a new one-story retail development on property currently used as a surface parking lot. Moreover, the Project would not have any indirect impacts to identified historic resources, as discussed below.

The McConnell GMC Pontiac Cadillac/Bay City Chevrolet building, OCHS C-Rated (proposed for B-Rated) Historic Resource is located adjacent to the project site, immediately north. A surface parking lot fronting Broadway for a length of about 350 feet covers the majority of the lot containing the adjacent historical resource. This paved area abuts the north property line of the project site and sits between the McConnell GMC Pontiac Cadillac/Bay City Chevrolet building (at the southwest corner of Hawthorne Street and Broadway) and the proposed Project building. The other two historic resources in the project vicinity, at 2946 Broadway (Firestone Tire & Rubber service station/Mercedes Benz of Oakland - OCHS B-rated) and 3074 Broadway (Grandjean Burman GM Co-Alzina garage / Window Tinting Plus - OCHS B-rated), are located about 100 feet away and across Broadway to the southeast and northeast, respectively, from the Project site.

Given distances between 100 and 350 feet, there is a sufficient buffer between the Project building and the historic resources in the Project vicinity such that the general setting of these resources would be maintained. In addition, the Project building would be situated fronting Broadway in a manner similar to the historic commercial buildings in the vicinity, thereby continuing the historical pattern of development along Broadway. Finally, the one-story, 40-foot maximum height of the Project building would not be substantially incompatible with the primarily single-story historic resources in the vicinity. Given this distance between the proposed construction area for the Project and the adjacent resources (separated by paved surface lots and/or the width of Broadway), and the extent of ground-shaking activity involved to construct the proposed one-story building, the Project is not expected to result in damage to the historic building on the adjacent lot. Compliance with CUL SCA 4, *Vibrations to Adjacent Historic Structures*, would apply to the Project to determine threshold levels of vibration and cracking that could damage the affected nearby historic buildings and design means and methods of construction that shall be utilized to not exceed those thresholds.

The considerations discussed regarding the proposed physical and use characteristics of the Project also ensure that the Project would not adversely affect the distinction of the ASI, which is characterized by less-intact, early 20th century commercial buildings, primarily auto-related. These contributors are also located across Broadway from the Project site, separated by the 100-foot width of the street.

Mitigation: None required.

Archaeological Resources

Impact CUL-2: The Project could result in significant impacts to unknown archaeological resources (Criterion 2). (Less than Significant)

The records search at the NWIC indicated that no archaeological sites have been previously identified in the broader project vicinity and that the nearest known archaeological sites are several miles south, nearer to the historic shoreline of the Bay tidal marshland. Although no known prehistoric resources have been recorded in the project site, there is a moderate potential that prehistoric archaeological resources are present within the Holocene alluvium (as discussed in the Study Results). Also, while the development of the project vicinity that began in the 1910s and 1920s may have destroyed subsurface historic-period archaeological remains, paved surfaces such as parking lots potentially cap and protect archaeological deposits. As described above, the Saint Mary's College (CHL 676), existed from 1889 to 1928 on what is now 3093 Broadway, immediately adjacent to the Project site. Trash pits, privies, or other archaeological features associated with the former school could be located on the project site which may have archaeological information potential.

Potential impacts to archaeological resources have been addressed in the Oakland General Plan, the LUTE EIR, as well as the City's SCA. Compliance with (1) General Plan objectives and policies addressing archaeological resources; (2) the LUTE EIR mitigation measure that specifically direct the City to establish procedures for determining when discretionary city approval of ground-disturbing activities warrant special conditions to safeguard archaeological resources; which has, in part, been incorporated into (3) the City's SCA's addressing archaeological resources, would reduced impacts on archaeological impacts to less than significant in most cases.

The area is recognized as moderately to highly sensitive for the existence of archaeological and buried sites not visible due to urban development in the project vicinity. However, implementation of the City of Oakland's CUL SCA 1, *Archaeological Resources*, is considered adequate to ensure that subsurface archaeological materials are dealt with according to regulatory guidance and would minimize the potential risk of impact to archaeological resources to a less-than-significant level. Through the City's review of the Project and *prior to issuance of a demolition, grading, or building permit***,** the project applicant shall first implement Provision A (Intensive Pre-Construction Study) of the City of Oakland's CUL SCA 1 because it is moderately to highly sensitive for the existence archaeological resources The salient excerpt from CUL SCA 1, Provision A, for archaeologically sensitive areas is reiterated below:

- ***Provision A: Intensive Pre-Construction Study*** – The project applicant, upon approval from the City Planning and Zoning Division, may choose to complete a site-specific, intensive archaeological resources study prior to soil-disturbing activities occurring on the project site. The purpose of the site-specific, intensive archaeological resources study is to identify early the potential presence of history-period archaeological resources on the project site. If that approach is selected, the study shall be conducted by a qualified archaeologist approved by the City Planning and Zoning Division. If prepared, at a minimum, the study shall include:

- An intensive cultural resources study of the project site, including subsurface presence/absence studies, of the project site. Field studies conducted by the approved archaeologist(s) may include, but are not limited to, auguring and other common methods used to identify the presence of archaeological resources;
- A report disseminating the results of this research;
- Recommendations for any additional measures that could be necessary to mitigate any adverse impacts to recorded and/or inadvertently discovered cultural resources.

If the results of the study indicate a high potential presence of historic-period archaeological resources on the project site, or a potential resource is discovered, the project applicant shall hire a qualified archaeologist to monitor any ground disturbing activities on the project site during construction (see Provision B, Construction-Period Monitoring), implement avoidance and/or find recovery measures (Provision C, Avoidance and/or Find Recovery, below), and prepare an ALERT Sheet that details what could potentially be found at the project site (Provision D, Construction ALERT Sheet).

Implementation of the City's CUL SCA 1, including an intensive pre-construction study prior to the issuance of a demolition, grading, or building permit**,** ensures less-than-significant effects to archaeological resources on the project site. The impact of the Project to archaeological resources is less than significant.

Mitigation: None required.

Paleontological Resources

Impact CUL-3: The Project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (Criterion 3). (Less than Significant)

As discussed above in the Paleontological Setting, the paleontological sensitivity of the geologic units underlying the broader project vicinity is low to moderate. Deep excavations for building foundations may disturb these geologic units of low to moderate paleontological sensitivity; the Project proposes excavation to up to 15 to 20 feet deep.

It is possible that fossils would be discovered during excavation within the project site. Because the significance of such fossils would be unknown, such an event represents a potentially significant impact to paleontological resources. However, CUL SCA 3, *Paleontological Resources*, would be incorporated with adoption and development under the Project and would ensure that the potential impact to fossils discovered within the rock units, would be less than significant. No additional mitigation is required.

Mitigation: None required.

Human Remains

Impact CUL-4: The Project could disturb human remains, including those interred outside of formal cemeteries (Criterion 4). (Less than Significant)

While there are no known locations of buried human remains in the broader project vicinity, the inadvertent discovery of human remains during ground disturbing activities cannot be entirely discounted. In the unlikely event that human remains are uncovered, implementation of CUL SCA 2, *Human Remains*, provides adequate measures for prevention of adverse impacts to human remains that may be discovered with the Project. Combining with CUL SCA 3 would ensure the impact is reduced to less than significant.

Mitigation: None required.

Cumulative Impacts

Impact CUL-5: The Project, combined with cumulative development in the project vicinity and citywide, including past, present, existing, approved, pending, and reasonably foreseeable future development within and around the Project, would not result in a significant adverse impact to cultural resources. (Less than Significant)

Geographic Context

The geographic context for the assessment of cumulative impacts to cultural resources consists of the project site and surroundings, the Broadway Valdez Specific Plan study area, in addition to all parts of the city.

Impacts

Implementation of the Project, when combined with the cumulative development citywide, could result in cumulative impacts to cultural resources. Cumulative effects could occur to resources beyond the project site because cultural resources can include a resource type or theme such as libraries, railroad-related resources, and ethnic sites that occur throughout the city. Past projects in this area are included in the existing setting. Present projects would include any projects currently under construction within the geographic context area. Several past, present and reasonably foreseeable future projects are described in the Major Projects List in Appendix B to this Draft EIR.

With implementation of the City’s SCA, the Project would not result in significant impacts to cultural resources. Given the applicability of CUL SCAs 1 through 4 to all projects, as well as the SCAs and mitigation measures identified in the environmental documents for all cumulative projects, potentially significant cumulative impacts to cultural resources would, under most circumstances, be reduced to a less-than-significant level. In addition, past projects have been, and present and reasonably foreseeable future projects would be, subject to development guidance contained within the Historic Preservation Element of the General Plan and other applicable historic preservation zoning controls and landmark ordinances to ensure protection of cultural resources.

Mitigation: None required.

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4.5 Geology, Soils and Geohazards

This section describes geologic and seismic conditions in the project site to provide relevant background information with respect to potential geologic and seismic hazards. This section describes the environmental and regulatory setting relevant to geology, soils, and geohazards within the project vicinity. Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary.

4.5.1 Environmental Setting

The project vicinity is located within the Coast Ranges Geomorphic Province[1] (Coast Ranges), characterized by northwest-southeast-trending mountain ridges and intervening valleys that have formed over millions of years due to movements along major regional faults. The bedrock of the Coast Ranges is primarily composed of ancient seafloor sediments and volcanic rocks. In most areas, these rocks have been significantly hardened, mineralized, folded and fractured by heat and pressure deep within the earth. This bedrock – broadly divided into the Franciscan Complex and Great Valley Sequence − forms most of the hills and mountains of the Bay Area, but may underlie the San Francisco Bay and adjacent plains at depths ranging from 200 to 2,000 feet. The valleys, plains, estuaries, and bay floors of the region are filled by loose, geologically young deposits of mud, silt, sand and gravel. The character of these flatbed deposits, such as those found beneath the project site and vicinity, varies significantly over short distances and depths, producing heterogeneous geologic conditions.

Geology, Soils and Geologic Hazards

The following discussion describes the general geology of the project vicinity and identifies potential risks associated with such conditions. The primary sources of information for this section consist of publicly available maps and reports prepared by U.S. Geological Survey (USGS), the California Geological Survey (CGS; formerly the California Division of Mines and Geology), and the Natural Resource Conservation Service (NRCS).

Site Topography and Local Geology

The project vicinity topography gently slopes east-southeasterly towards Glen Echo Creek. In general, the site is on a relatively flat topography approximately 50 to 60 feet above mean sea level. Artificial fills placed over Bay Mud is extensive as a result of the practice of infilling of the natural Bay margins west of I-880 near downtown Oakland, as well as the shoreline of both San Francisco Bay and Lake Merritt (CGS, 2003). A geologic map compiled by Witter and others of the USGS (2006) shows that much of the areas bordering Lake Merritt and the Oakland Estuary are comprised of artificial fill material overlying natural deposits of Bay Mud. Beneath surface fills, the project vicinity is primarily underlain by stream bed deposits. Fifty meters or more of interlayered beds of

[1] A geomorphic province is an area that possesses similar bedrock, structure, history, and age. California has 11 geomorphic provinces.

gravelly sand generally grade up to silty clays in these deposits of both Holocene[2] and Pleistocene[3] age (Graymer, 2000; Witter et al., 2006).

Soils

The project vicinity includes largely developed properties, and as a result the ground surface is generally devoid of natural soils. The U.S. Department of Agriculture NRCS has characterized soils beneath the project vicinity as "Urban Land" soils (NRCS, 2012). The NRCS designates soils as urban land when soils have been so altered or obstructed by urbanization—such as buildings, pavement, and cut and fill operations—that identification of the native soils is not feasible. According to a Phase 1 Environmental Site Assessment conducted for the Project, the project site subsurface soil generally consists of an upper relatively impermeable silty clay underlain by a more permeable, coarser clay and sand at roughly 25 to 35 feet below ground surface (Basics Environmental, 2012).

Geologic Hazards

The artificial fills and natural geology underlying the project vicinity present potential hazards related to soil erosion, settlement, and expansive soil materials. These hazards are discussed below and provide the initial context for further evaluation in the impact analysis. Because the project site is relatively flat and is developed, slope-related ground failure (i.e., landslides) is not expected to pose a hazard (WRT, 2009).

Expansive Soils

Expansive soils possess a "shrink-swell" behavior. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may occur over a long period of time, usually as a result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. The alluvial fan deposits likely underlying the western portion of the project site consists of gravely and clayey sand or clayey gravel and sandy clay, which could exhibit shrink-swell behavior (Graymer, 2000).

Soil Erosion

Erosion is the wearing away of soil and rock by processes, such as mechanical or chemical weathering, mass wasting, and the action of waves, wind and underground water. Excessive soil erosion can eventually lead to damage of building foundations and roadways. Areas that are susceptible to erosion are those that would be exposed during the construction phase of the Project. Typically, the soil erosion potential is reduced once the soil is graded and covered with concrete, structures, asphalt, or slope protection.

Settlement

Settlement can occur from immediate settlement, consolidation, or shrinkage of expansive soil. Immediate settlement occurs when a load from a structure or placement of new fill material is

[2] Holocene time is from the present to 11,000 years ago.
[3] Pleistocene time was from 11,000 to 1.6 million years ago.

applied, causing distortion in the underlying materials. This settlement occurs quickly and is typically complete after placement of the final load. Consolidation settlement occurs in saturated clay from the volume change caused by squeezing out water from the pore spaces. Consolidation occurs over a period of time and is followed by secondary compression, which is a continued change in void ratio under the continued application of the load. Rapid settlement can occur if soil is liquefied during an earthquake, an effect which is addressed later in the discussion of Seismic Hazards.

Soils tend to settle at different rates and by varying amounts depending on the load weight or changes in soil properties over an area, which is referred to as differential settlement. The clay content of the alluvium likely underlying the western portion of the project site may cause this area to be susceptible to settlement as well (Graymer, 2000; NRCS 2012). Areas where historic bay sloughs, old foundations, and former marsh areas have been buried by fill material may be subject to variable conditions and are likely to experience some degree of differential settlement.

Regional Faulting and Seismic Hazards

This section characterizes the region's existing faults, describes historic earthquakes, estimates the likelihood of future earthquakes, and describes probable ground-shaking effects. The primary sources of information for this section are publications prepared by USGS, CGS, and hazard mapping tools provided by the Association of Bay Area Governments.

Earthquake Terminology and Concepts

Earthquake Mechanisms and Fault Activity

Faults are planar features within the earth's crust that have formed to release stresses caused by the dynamic movements of the earth's major tectonic plates. An earthquake on a fault is produced when these stresses overcome the inherent strength of the earth's crust, and the rock ruptures. The rupture causes seismic waves to propagate through the earth's crust, producing the ground-shaking effect known as an earthquake. The rupture also causes variable amounts of slip along the fault, which may or may not be visible at the earth's surface.

Geologists commonly use the age of offset rocks as evidence of fault activity—the younger the displaced rocks, the more recently earthquakes have occurred. To evaluate the likelihood that a fault will produce an earthquake, geologists examine the magnitude and frequency of recorded earthquakes and evidence of past displacement along a fault. An *active* fault is defined by the State of California as a fault that has had surface displacement within Holocene time (last 11,000 years). Only "sufficiently active"[4] and "well-defined"[5] faults are considered for zoning purposes.

[4] A fault is deemed sufficiently active if there is evidence of Holocene surface displacement along one or more of its segments or branches. Holocene surface displacement may be directly observable or inferred; it need not be present everywhere along a fault to qualify that fault for zoning.

[5] A fault is considered well-defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods (e.g., geomorphic or geophysical evidence). The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

Earthquake Magnitude

When an earthquake occurs along a fault, a characteristic way to measure its size is to measure the energy released during the event. Seismologists currently use Moment Magnitude as the preferred way to measure earthquakes. The Moment Magnitude scale (Mw) is related to the physical characteristics of a fault, including the rigidity of the rock, the size of fault rupture, and the style of movement or displacement across the fault.

Peak Ground Acceleration

A common measure of ground motion at any particular site during an earthquake is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. In terms of automobile accelerations, one "g" of acceleration is equivalent to the motion of a car traveling 328 feet from rest in 4.5 seconds. For comparison purposes, the maximum PGA value recorded during the Loma Prieta earthquake was in the vicinity of the epicenter, near Santa Cruz, and was 0.64g (ABAG, 2003a). Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place, and is dependent on the distance from the epicenter and the character of the underlying geology (e.g., hard bedrock, soft sediments or artificial fills).

The Modified Mercalli Intensity Scale

The Modified Mercalli Intensity Scale (**Table 4.5-1**) assigns an intensity value based on the observed effects of ground-shaking produced by an earthquake. Unlike measures of earthquake magnitude and PGA, the Modified Mercalli (MM) intensity scale is qualitative in nature, which means that it is based on actual observed effects rather than measured values. Similar to PGA, MM intensity values for an earthquake at any one place can vary depending on its magnitude, the distance from its epicenter, the focus its energy, and the type of geologic material. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to significant structural damage. Because the MM is a measure of ground-shaking effects, intensity values can be related to a range of PGA values, also shown in Table 4.5-1.

Seismic Context

The project site lies within the San Francisco Bay Area, a region of California characterized by active (Holocene) and potentially active (Quaternary) faults, and is considered an area of high seismic activity. The USGS along with the CGS and the Southern California Earthquake Center formed the 2007 Working Group on California Earthquake Probabilities to summarize the probability of one or more earthquakes of magnitude 6.7 or higher occurring in the state of California over the next 30 years. Accounting for the wide range of possible earthquake sources, it is estimated that the Bay Area has a 63 percent chance of experiencing such an earthquake (Working Group on California Earthquake Probabilities, 2008). According to the working group, the individual faults posing the greatest threat to the Bay Area are the Hayward, the San Andreas, and the Calaveras faults (USGS, 2012). Other principal faults capable of producing large

TABLE 4.5-1
MODIFIED MERCALLI INTENSITY SCALE

Intensity Value	Intensity Description	Average Peak Ground Acceleration[a]
I	Not felt except by a very few persons under especially favorable circumstances.	< 0.0017 g
II	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	0.0017-0.014 g
III	Felt noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly, vibration similar to a passing truck. Duration estimated.	0.0017-0.014 g
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	0.014–0.039g
V	Felt by nearly everyone, many awakened. Some dishes and windows broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles may be noticed. Pendulum clocks may stop.	0.035 – 0.092 g
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; and fallen plaster or damaged chimneys. Damage slight.	0.092 – 0.18 g
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	0.18 – 0.34 g
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	0.34 – 0.65 g
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.65 – 1.24 g
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 1.24 g
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 1.24 g
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 1.24 g

[a] Value is expressed as a fraction of the acceleration due to gravity (g). Gravity (g) is 9.8 meters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

SOURCE: ABAG, 2003a.

earthquakes in the Bay Area include the Concord–Green Valley, Marsh Creek–Greenville, San Gregorio and Rodgers Creek faults. **Table 4.5-2** lists the above mentioned faults, their distance and directions from the project site, and their maximum credible earthquake magnitude. The Hayward fault, which is the closest to the project site, is briefly described below.

TABLE 4.5-2
ACTIVE FAULTS IN THE REGION

Fault	Closest Approximate Distance and Direction	Recency of Movement[a]	Future Earthquake Probability[b]	Historical Seismicity	Maximum Moment Magnitude Earthquake (Mw)[c]
Hayward (Northern Section)	2.5 miles northeast	Historic	31% (combined with Rodgers Creek Fault)	M 6.8 in 1868 Many <M 4.5	7.1
Calaveras (Northern Section)	14 miles east	Historic	7%	M 5.6–M 6.4 in 1861 M 6.2, 1911 in 1984	6.8
San Andreas (Peninsula Section)	14 miles southwest	Historic	21%	M 7.1 in 1989 M 8.25 in 1906 M 7.0 in 1838 Many <M 6	7.9
San Gregorio	21 miles southwest	Holocene	6%	n/a	7.3
Concord–Green Valley (Avon Section)	16 miles northeast	Historic	3%	Historic active creep	6.7
Marsh Creek–Greenville	26 miles east	Historic	3%	M 5.6 in 1980	6.9
Rodgers Creek	26 miles north	Holocene	31% (combined with Hayward Fault)	M 6.7 in 1898 M 5.6 and 5.7 in 1969	7.0

[a] Recency of faulting from Jennings and Bryant (2010). Historic: displacement during historic time (within last 200 years), including areas of known fault creep; Holocene: evidence of displacement during the last 11,000 years; Quaternary: evidence of displacement during the last 1.6 million years; Pre-Quaternary: no recognized displacement during the last 1.6 million years (but not necessarily inactive).
[b] Probability of one or more earthquakes of magnitude 6.7 or greater in the next 30 years from the Working Group on California Earthquake Probabilities (2008). The Working Group estimates the probability of a “background” earthquake not from one of the seven major faults studied to be 9%.
[c] The Maximum Moment Magnitude Earthquake is derived from the joint CDMG/USGS Probabilistic Seismic Hazard Assessment for the State of California (Peterson et al., 1996).

SOURCES: Bryant and Hart, 2007; Jennings and Bryant, 2010; Working Group on California Earthquake Probabilities (2008); Peterson et al., 1996.

Hayward Fault

The Hayward Fault Zone, located as close as 2.5 miles northeast from the Project, extends for 60 miles from San Pablo Bay in Richmond south to the San Jose area. The Hayward fault has historically generated one sizable earthquake, in 1868, when a Richter magnitude 7 earthquake on its southern segment ruptured the ground for a distance of about 20 miles (USGS, 2008). Lateral ground surface displacement during this event was an average of 6 feet (USGS, 2008).

A characteristic feature of the Hayward fault is its well-expressed and relatively consistent fault creep. Although large earthquakes on the Hayward fault have been rare since 1868, slow fault creep has continued to occur and has caused measurable offset. Fault creep on the Southern segment of the Hayward fault is estimated at between 3 and 9 millimeters per year (mm/yr) (Bryant and Cluett, 2000). However, a large earthquake could occur on the Hayward fault with an estimated moment magnitude of about Mw 7.1 (Table 4.5-2). The USGS Working Group on California Earthquake Probabilities (2008) identifies the Hayward–Rodgers Creek Fault Systems as having a 31 percent chance of generating one or more earthquakes of magnitude 6.7 or greater in the next 30 years.

Seismic Hazards

Seismic hazards are generally classified in two categories: primary seismic hazards (surface fault rupture and ground shaking) and secondary seismic hazards (liquefaction and other types of seismically induced ground failure, along with seismically induced landslides). The following discussion identifies the seismic hazards for the project vicinity and provides the initial context for further evaluation in the impact analysis.

Surface Fault Rupture

Seismically-induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Ground rupture is considered more likely along active faults, which are referenced in Table 4.5-2. Although future earthquakes could occur anywhere along the length of an active fault, only regional strike-slip earthquakes of magnitude 6.0 or greater are likely to be associated with surface fault rupture and offset (CGS, 1996). It is also important to note that earthquake activity and fault rupture due to unmapped subsurface fault traces is a possibility that is not predictable.

Ground rupture is considered more likely along active faults, which are referenced above in Table 4.5-2. The highest potential for surface faulting is along existing fault traces that have had Holocene fault displacement. The closest active fault to the project site is the northern section of the Hayward Fault, approximately 2.5 miles to the northeast. The risk of fault rupture is considered low because the project site is not crossed by an Alquist-Priolo Fault Rupture Hazard Zone, as designated by the Alquist-Priolo Earthquake Fault Zoning Act, and no active or potentially active faults are known to pass through the project site (CGS, 1982).

Seismic Ground Shaking

As discussed above, a major earthquake is likely to affect the project vicinity within the next 30 years, and would produce strong ground-shaking effects throughout the region. Earthquakes on active or potentially active faults, depending on magnitude and distance from the project vicinity, could produce a range of ground-shaking intensities. Historically, earthquakes have caused strong ground-shaking and damage in the San Francisco Bay Area, the most recent being the M 6.9 Loma Prieta earthquake in October 1989. The epicenter was approximately 46 miles south of the project vicinity, but this earthquake is estimated to have caused moderate (VI) to very strong (VIII) shaking intensities in the Oakland area (ABAG, 2003a). The largest earthquake in Bay Area history was the San Francisco Earthquake of 1906, with an estimated moment magnitude of 7.9. This produced strong (VII) to violent (IX) shaking intensities in the project vicinity (ABAG, 2003b).

The primary tool that seismologists use to describe ground-shaking hazard is a probabilistic seismic hazard assessment (PSHA). The PSHA for the State of California takes into consideration the range of possible earthquake sources (including such worse-case scenarios as described above) and estimates their characteristic magnitudes to generate a probability map for ground shaking. The PSHA maps depict values of peak ground acceleration (PGA) that have a 10 percent probability of being exceeded in 50 years (1 in 475 chance of occurring each year). Use of this probability level allows engineers to design buildings for ground motions that have a 90 percent chance of *not* occurring in the next 50 years, making buildings safer than if they were simply designed for the most probable events. The PSHA has indicated that PGA values from 0.671 to 0.677 have a 10 percent chance of being exceeded in 50 years in the project vicinity, depending on the type of underlying soil material (USGS and CGS, 2002; see **Table 4.5-3** below).

TABLE 4.5-3
PROBABILISTIC SEISMIC HAZARD ASSESSMENT PEAK GROUND ACCELERATION VALUES FOR PLAN AREA GEOLOGIC UNITS

Geologic Unit[a]	Approximate Extent of Geologic Unit in Plan Area	PSHA Map PGA Value[b]	Liquefaction Susceptibility Rating (at <10 feet to groundwater/ 10-30 feet to groundwater)[c,d]	Estimated PGA Threshold Required to Trigger Liquefaction[c]
Qof (Early to Middle Pleistocene alluvium)	West side of Broadway between 26th and I-580	0.675g	Low/Low	> 0.6g

[a] After Witter et al., 2006
[b] Using central longitude and latitude of each geologic unit in the Plan Area
[c] After Witter et al., 2006
[d] Depth to groundwater surface from CGS 2003

SOURCES: Witter et al., 2006; USGS and CGS, 2002; CGS 2003.

Liquefaction

Liquefaction is a transformation of soil from a solid to a liquefied state, during which saturated soil temporarily loses strength resulting from the buildup of excess pore water pressure, especially during earthquake-induced cyclic loading. Soil susceptible to liquefaction includes loose- to medium-density sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Four kinds of ground failure commonly result from liquefaction: lateral spread, flow failure, ground oscillation, and loss of bearing strength.

Liquefaction can occur in unconsolidated or artificial fill sediments and other reclaimed areas along the margin of San Francisco Bay. The depth to groundwater influences the potential for liquefaction, in that sediments need to be saturated to have a potential for liquefaction. Depth to groundwater in the close project vicinity has historically been measured ranged from approximately 15 to 24 feet below ground surface.

Earthquake-Induced Settlement

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, uncompacted, and variable sandy sediments above the water table) due to the rearrangement of soil particles during prolonged ground-shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different amounts). Areas underlain by artificial fill would be susceptible to this type of settlement.

4.5.2 Regulatory Framework

State

The statewide minimum public safety standard for mitigation of earthquake hazards (as established through the California Building Code [CBC], Alquist-Priolo Earthquake Fault Zoning Act, and the Seismic Hazards Mapping Act) is that the minimum level of mitigation for a project should reduce the risk of ground failure during an earthquake to a level that does not cause the collapse of buildings for human occupancy, but in most cases, is not required to prevent or avoid the ground failure itself. It is not feasible to design all structures to completely avoid damage in worst-case earthquake scenarios. Accordingly, regulatory agencies have generally defined an "acceptable level" of risk as that which provides reasonable protection of the public safety, though it does not necessarily ensure continued structural integrity and functionality of a project [CCR Title 14, Section 3721(a)]. Nothing in these acts, however, precludes lead agencies from enacting more stringent requirements, requiring a higher level of performance, or applying these requirements to developments other than those that meet the acts' definitions of "project."

California Building Code

The CBC has been codified in the California Code of Regulations (CCR) as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 to be enforceable. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The 2010 edition of the CBC is based on the 2009 International Building Code (IBC) published by the International Code Conference. The 2010 CBC contains California amendments based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (such as wind loads) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (Public Resources Code, Chapter 7.8, Section 2690-2699.6) was developed to reduce the threat to public safety and to minimize the loss of life and property by identifying and mitigating ground failure caused by strong earthquakes, namely liquefaction and slope failure. While this Act pertains to seismic hazards, they are not the same as the fault surface rupture hazard regulated by the Alquist-Priolo Special Studies Zone Act of 1972. The Seismic Hazards Mapping Act requires the State Geologist to delineate seismic hazard zones, also known as “zones of required investigation”, where regional (that is, not site-specific) information suggests that the probability of a hazard requiring mitigation is great enough to warrant a site-specific investigation. The fact that a site lies outside a zone of required investigation does not necessarily mean that the site is free from seismic or other geologic hazards. Where a project—defined by the act as any structures for human occupancy or any subdivision of land that contemplates the eventual construction of structures for human occupancy—is within a zone of required investigation, lead agencies must apply minimum criteria for project approval. The most basic criteria for project approval are that the owner/developer adequately demonstrates seismic hazards at the site have been evaluated in a geotechnical report, that appropriate mitigation measures have been proposed, and that the lead agency has independently reviewed the adequacy of the hazard evaluation and proposed mitigation measures. Both the geotechnical report and the independent review must be performed by a certified engineering geologist or registered civil engineer. These criteria, along with seismic hazard evaluation and mitigation standards, are outlined in California Geological Survey Special Publication 117A, revised and re-adopted in September of 2008 by the State Mining and Geology Board (CGS, 2008).

City of Oakland Regulations

City of Oakland General Plan

The Safety Element of the City of Oakland General Plan enumerates the following policies and actions designed to reduce risks associated with earthquakes that may affect the City of Oakland:

- ***Geologic Hazards, Policy GE-1*:** Develop and continue to enforce and carry out regulations and programs to reduce seismic hazards and hazards from seismically triggered phenomena.

    Action GE-1.2: Enact regulations requiring the preparation of site-specific geologic or geotechnical reports for development proposals in areas subject to earthquake-induced liquefaction, settlement or severe ground shaking, and conditioning project approval on the incorporation of necessary mitigation measures.

- ***Geologic Hazards, Policy GE-2:*** Continue to enforce ordinances and implement programs that seek specifically to reduce the landslide and erosion hazards.

    Action GE-2.1: Continue to enforce provisions under the subdivision ordinance requiring that, under certain conditions, geotechnical reports be filed and soil hazards investigations be made to prevent grading from creating unstable slopes, and that any necessary corrective actions be taken.

Action GE-2.2: Continue to enforce the grading, erosion and sedimentation ordinance by requiring, under certain conditions, grading permits and plans to control erosion and sedimentation.

Action GE-2.6: Design fire-preventive vegetation-management techniques and practices for creeksides and high-slope areas that do not contribute to the landslide and erosion hazard.

- ***Geologic Hazards, Policy GE-3:*** Continue, enhance or develop regulations and programs designed to minimize seismically related structural hazards from new and existing buildings.

    Action GE-3.1: Adopt and amend as needed updated versions of the California building code so that optimal earthquake-protection standards are used in construction and renovation projects.

    Action GE-3.3: Continue to enforce the earthquake-damaged structures ordinance to ensure that buildings damaged by earthquakes are repaired to the extent practicable.

- ***Geologic Hazards, Policy GE-4*****:** Work to reduce potential damage from earthquakes to "lifeline" utility and transportation systems.

    Action GE-4.2: As knowledge about the mitigation of geologic hazards increases, encourage public and private utility providers to develop additional measures to further strengthen utility systems against damage from earthquakes, and review and comment on proposed mitigation measures.

City of Oakland Municipal Code

The Safety Element of the City of Oakland's General Plan identifies policies and actions that apply to geologic hazards. The City implements these pertinent sections of the General Plan by enforcing the ordinances described. Among these are ordinances to minimize soil hazards, reduce soil erosion and protect stream quality, prevent grading from creating unstable slopes, abate unreinforced masonry building hazards, and mitigate fault rupture hazards.

Subdivision Ordinance (incorporated in Chapter 16.20.060 of the Oakland Municipal Code**):** Requires that the subdivider file a preliminary soil report with the City Engineer prior to the submission of a final subdivision map. The preliminary soil report must describe (1) how slopes will be kept stable against sliding and excessive erosion, and (2) if critically expansive soils are present or if other hazardous or problematic soil characteristics are present and what measures can be taken to avoid these hazards or problems. This preliminary soil report may be waived if the Building Inspector and City Engineer both agree that no preliminary analysis is necessary (Ordinance 11924, Section 4).

Subdivision Ordinance (Chapter 16.20.080)**:** If the preliminary report indicates the presence of critically expansive soils, instability of slopes, or other soil problems which would lead to structural damage, a soil investigation of each lot in the subdivision shall be made by a civil engineer who is registered by the state of California. The soil investigation shall be made after grading, and a report shall be submitted recommending corrective action which is likely to prevent structural damage to each structure proposed to be constructed in the subdivision. Copies of the report shall be filed with the Building

Inspector and the Street Engineering Department. The information contained in the report of the soils investigation may be included in the certificate respecting the grading work.

Grading Ordinance (Chapter 15.04.660): The Grading Ordinance requires a permit for grading activities on private or public property for projects that exceed certain criteria, such as amount of proposed excavation and degree of site slope. During project construction, the volume of the excavated fill material could exceed 50 cubic yards and could result in a 20 percent slope onsite, or the depth of excavation could exceed five feet at any location. Therefore, the project sponsor would be required to apply for the grading permit and prepare a grading plan, erosion and sedimentation control plan, and drainage plan.

Building Services Division

In addition to compliance with building standards set forth by the 2009 IBC and 2010 CBC, a project applicant would be required to submit to the Oakland Building Services Division an engineering analysis accompanied by detailed engineering drawings for review and approval prior to excavation, grading, or construction activities on a project site. Specifically, an engineering analysis report and drawings of relevant grading or construction activities on a project site would be required to address constraints and incorporate recommendations identified in geotechnical investigations. These required submittals and City reviews ensure that the buildings are designed and constructed in conformance with the seismic and other requirements of all applicable building code regulations, pursuant to standard City of Oakland procedures.

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

The City of Oakland's SCA relevant to reducing geologic and seismic impacts due to the Project are listed below. If the Project is approved by the City, all applicable SCA would be adopted as conditions of approval and required of the Project to help ensure less-than-significant impacts from geologic and seismic conditions. The SCA are incorporated and required as part of the Project, so they are not listed as mitigation measures.

- **GEO SCA 1: Erosion and Sedimentation Control Plan**

  Prior to any grading activities. The project applicant shall obtain a grading permit if required by the Oakland Grading Regulations pursuant to Section 15.04.660 of the Oakland Municipal Code. The grading permit application shall include an erosion and sedimentation control plan for review and approval by the Building Services Division. The erosion and sedimentation control plan shall include all necessary measures to be taken to prevent excessive stormwater runoff or carrying by stormwater runoff of solid materials on to lands of adjacent property owners, public streets, or to creeks as a result of conditions created by grading operations. The plan shall include, but not be limited to, such measures as short-term erosion control planting, waterproof slope covering, check dams, interceptor ditches, benches, storm drains, dissipation structures, diversion dikes, retarding berms and barriers, devices to trap, store and filter out sediment, and stormwater retention basins. Off-site work by the project applicant may be necessary. The project applicant shall obtain permission or easements necessary for off-site work. There shall be a clear notation that the plan is subject to changes as changing conditions occur. Calculations of anticipated stormwater runoff and sediment volumes shall be included, if required by the Director of Development or designee. The plan shall specify that, after construction is complete, the project applicant shall ensure that the storm drain system shall be inspected and that the project applicant shall clear the system of any debris or sediment.

Ongoing throughout grading and construction activities. The project applicant shall implement the approved erosion and sedimentation plan. No grading shall occur during the wet weather season (October 15 through April 15) unless specifically authorized in writing by the Building Services Division.

- **GEO SCA 2: Soils Report**

Required as part of the submittal of a Tentative Tract or Tentative Parcel Map. A preliminary soils report for each construction site within the project area shall be required as part of this project and submitted for review and approval by the Building Services Division. The soils reports shall be based, at least in part, on information obtained from on-site testing. Specifically the minimum contents of the report should include:

a) Logs of borings and/or profiles of test pits and trenches:

1. The minimum number of borings acceptable, when not used in combination with test pits or trenches, shall be two (2), when in the opinion of the Soils Engineer such borings shall be sufficient to establish a soils profile suitable for the design of all the footings, foundations, and retaining structures.
2. The depth of each boring shall be sufficient to provide adequate design criteria for all proposed structures.
3. All boring logs shall be included in the soils report.

b) Test pits and trenches

1. Test pits and trenches shall be of sufficient length and depth to establish a suitable soils profile for the design of all proposed structures.
2. Soils profiles of all test pits and trenches shall be included in the soils report.

c) A plat shall be included which shows the relationship of all the borings, test pits, and trenches to the exterior boundary of the site. The plat shall also show the location of all proposed site improvements. All proposed improvements shall be labeled.

d) Copies of all data generated by the field and/or laboratory testing to determine allowable soil bearing pressures, sheer strength, active and passive pressures, maximum allowable slopes where applicable and any other information which may be required for the proper design of foundations, retaining walls, and other structures to be erected subsequent to or concurrent with work done under the grading permit.

e) A written Soils Report shall be submitted which shall include but is not limited to the following:

1. Site description
2. Local and site geology
3. Review of previous field and laboratory investigations for the site
4. Review of information on or in the vicinity of the site on file at the Information Counter, City of Oakland, Office of Planning and Building.

5. Site stability shall be addressed with particular attention to existing conditions and proposed corrective attention to existing conditions and proposed corrective actions at locations where land stability problems exist.
6. Conclusions and recommendations for foundations and retaining structures, resistance to lateral loading, slopes, and specifications, for fills, and pavement design as required.
7. Conclusions and recommendations for temporary and permanent erosion control and drainage. If not provided in a separate report they shall be appended to the required soils report.
8. All other items which a Soils Engineer deems necessary.
9. The signature and registration number of the Civil Engineer preparing the report.

f) The Director of Planning and Building may reject a report that she/he believes is not sufficient. The Director of Planning and Building may refuse to accept a soils report if the certification date of the responsible soils engineer on said document is more than three years old. In this instance, the Director may be require that the old soils report be recertified, that an addendum to the soils report be submitted, or that a new soils report be provided.

- **GEO SCA 3: Geotechnical Report**

  Required as part of the submittal of a tentative Tract Map or tentative Parcel Map.

a) A site-specific, design level, Landslide or Liquefaction geotechnical investigation for each construction site within the project area shall be required as part of this project and submitted for review and approval by the Building Services Division. Specifically:

1. Each investigation shall include an analysis of expected ground motions at the site from identified faults. The analyses shall be accordance with applicable City ordinances and polices, and consistent with the most recent version of the California Building Code, which requires structural design that can accommodate ground accelerations expected from identified faults.
2. The investigations shall determine final design parameters for the walls, foundations, foundation slabs, surrounding related improvements, and infrastructure (utilities, roadways, parking lots, and sidewalks).
3. The investigations shall be reviewed and approved by a registered geotechnical engineer. All recommendations by the project engineer, geotechnical engineer, shall be included in the final design, as approved by the City of Oakland.
4. The geotechnical report shall include a map prepared by a land surveyor or civil engineer that shows all field work and location of the “No Build” zone. The map shall include a statement that the locations and limitations of the geologic features are accurate representations of said features as they exist on the ground, were placed on this map by the surveyor, the civil engineer or under their supervision, and are accurate to the best of their knowledge.
5. Recommendations that are applicable to foundation design, earthwork, and site preparation that were prepared prior to or during the projects design phase, shall be incorporated in the project.

6. Final seismic considerations for the site shall be submitted to and approved by the City of Oakland Building Services Division prior to commencement of the project.
7. A peer review is required for the Geotechnical Report. Personnel reviewing the geologic report shall approve the report, reject it, or withhold approval pending the submission by the applicant or subdivider of further geologic and engineering studies to more adequately define active fault traces.

b) Tentative Tract or Parcel Map approvals shall require, but not be limited to, approval of the Geotechnical Report.

4.5.3 Impacts and Mitigation Measures

Significance Criteria

The Project would have a significant impact on the environment if it were to:

1. Expose people or structures to substantial risk of loss, injury, or death involving:
2. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map or Seismic Hazards Map issued by the State Geologist for the area or based on other substantial evidence of a known fault [**NOTE**: Refer to California Geological Survey 42 and 117 and Public Resources Code section 2690 et. seq.];
3. Strong seismic ground shaking;
4. Seismic-related ground failure, including liquefaction, lateral spreading, subsidence, collapse; or
5. Landslides;
6. Result in substantial soil erosion or loss of topsoil, creating substantial risks to life, property, or creeks/waterways;
7. Be located on expansive soil, as defined in Section 1802.3.2 of the California Building Code (2007, as it may be revised), creating substantial risks to life or property;
8. Be located above a well, pit, swamp, mound, tank vault, or unmarked sewer line, creating substantial risks to life or property;
9. Be located above landfills for which there is no approved closure and post-closure plan, or unknown fill soils, creating substantial risks to life or property; or
10. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater

Approach to Analysis

Project construction activities would require ground disturbance and use of hazardous materials. These types of construction activities could result in impacts to or from geology, soils, and geohazards. Potential impacts to geology, soils, and geohazards are analyzed within the context of existing plans and policies, permitting requirements, local ordinances, and the City of Oakland's

Standard Conditions of Approval. Impacts that would be substantially reduced or eliminated by compliance with these policies or requirements are found to be less-than-significant. Additional discussion of potential erosion impacts is presented in Section 4.8, *Hydrology and Water Quality* of this Draft EIR. Detailed analysis of potential impacts due to the use of hazardous materials is presented in Section 4.7, *Hazards and Hazardous Materials*, of this Draft EIR. Potential impacts to stormwater infrastructure are discussed in Section 4.13, *Utilities and Service Systems*, of this Draft EIR.

Based on the geographical location of the project site, its development would not result in impacts related to the following criteria. No impact discussion is provided for these topics for the following reasons:

- ***Fault Rupture.*** The faults most susceptible to earthquake rupture are active faults, which are faults that have experienced surface displacement within the last 11,000 years. There are no active faults that cross the project site, and the nearest active fault is more than two miles away. Therefore, the potential for fault rupture to affect the Project is very low.

- ***Landslides.*** The project site and vicinity does not contain slopes that are susceptible to landslides or slope failure. The gentle sloping topography of the area puts the potential for landslides or slope failure to affect the Project as very low and is therefore not discussed further. Discussion on earthquake-induced ground failure is provided in Impact GEO-1.

- ***Substantial soil erosion or loss of topsoil.*** Section 4.8, *Hydrology and Water Quality*, of this Draft EIR discusses soil erosion and its effect on water quality. This criterion focuses more on the potential for excessive or accelerated erosion to undermine building foundations. Measures to reduce soil erosion during construction for water quality purposes would effectively prevent excessive rilling or rutting of soil on construction sites (see Section 4.8). The project site is in a developed urban area that is paved or landscaped, and served by a storm drain system. Therefore there would be no impact from excessive erosion on foundations or utilities.

- ***Well, pit, swamp, mound, tank vault, or unmarked sewer line.*** A Phase 1 Environmental Site Assessment was conducted for the project site in 2012 (Basics Environmental, 2012). The assessment included a historical account of the property use of which there was no evidence that the project site could contain a well, pit, swamp, mound, tank vault, or unmarked sewer line. Therefore, there would be no impact associated with these hazards.

- ***Landfills.*** A Phase 1 Environmental Site Assessment was conducted for the project site in 2012 (Basics Environmental, 2012). The assessment concluded that no contamination or recognized environmental conditions are suspected or known to have occurred on the project site including the presence of a landfill. Therefore, there would be no impact associated with this hazard.

- ***Wastewater Disposal.*** The project site is located within an urban area where all development would be able to tie into existing wastewater infrastructure. Therefore, the Project would not require the use of septic or other alternative disposal wastewater systems, and therefore no impact is associated with this hazard.

Impacts

Impact GEO-1: The Project could expose people or structures to seismic hazards such as ground shaking and seismic-related ground failure such as liquefaction, differential settlement, collapse, or lateral spread (Criteria 1 through 4). (Less than Significant)

As described in the Regulatory Framework, the Project would be required to comply with the Seismic Hazards Mapping Act (in liquefaction hazard zones) and with the CBC. These laws require development projects to demonstrate that (1) soil conditions are known and that foundations have been designed according to the proper seismic design category, and (2) that the risk of liquefaction and other ground failures has been evaluated and that appropriate mitigation measures, if necessary, have been incorporated into project design. Any project located wholly or partly within a Seismic Hazard Zone for liquefaction, would be required to comply with CGS guidelines for evaluating and mitigating seismic hazards (Special Publication 117A) (CGS, 2008).

To ensure compliance with these laws, as well as the seismic requirements of the City of Oakland Building Code, the City requires owners/developers to prepare a soils report and geotechnical report for proposed developments that include generally accepted and appropriate engineering techniques for determining the susceptibility of a project site to various geologic and seismic hazards. These requirements are implemented through uniformly-applied SCA, consistent with General Plan Policies. The geotechnical report (GEO SCA 3, *Geotechnical Report*) would include an analysis of ground shaking effects, liquefaction potential, and provide recommendations to reduce these hazards. The Project would be required to submit an engineering analysis accompanied by detailed engineering drawings to the City of Oakland Building Services Division prior to excavation, grading, or construction activities on the project site. Geotechnical and seismic design criteria would conform to engineering recommendations consistent with the seismic requirements set forth in the California Code of Regulations, Title 24, California Building Standards Code in effect at the time of permit application.

Further, the Project would be required to comply with the requirements of the CBC, Seismic Hazards Mapping Act, and Oakland's standard conditions of approval would ensure that the Project would not expose people or structures to an unacceptable level of risk during a large regional earthquake. [6]

Earthquakes can and will occur in the region and the Project may be affected. However, the application of current seismic design criteria required under the CBC and the SCAs would reduce the potential impacts associated with ground shaking during a major seismic event to less than significant.

Mitigation: None required.

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[6] An "acceptable level" of risk means that which provides reasonable protection of the public safety, though it does not necessarily ensure continued structural integrity and functionality of the project [CCR Title 14, Section 3721(a)].

Impact GEO-2: The Project could be subjected to geologic hazards, including expansive soils, subsidence, seismically-induced settlement and differential settlement (Criterion 7). (Less than Significant)

As discussed in the setting, soils containing a high percentage of clays are generally most susceptible to expansion. Expansive soils can damage foundations of above-ground structures, paved roads and streets, and concrete slabs. Soils and artificial fill that underly much of the project vicinity could potentially be subject to shrink-swell behavior. Further settlement and differential settlement could affect the Project. As discussed in Impact GEO-1, the City of Oakland imposes SCAs requiring proposed developments to conduct a soil reports (GEO SCA 2) and geotechnical studies (GEO SCA 3). These SCAs would ensure that construction methods and building designs are in place to overcome problematic soils (such methods typically involve soil removal and replacement, or special foundation design). SCAs would ensure that structures are protected from expansive soil and settlement concerns. The application of current geotechnical design criteria required under the CBC and the SCAs would reduce the potential impacts associated with expansive soils, subsidence, seismically-induced settlement and differential settlement to less than significant.

Mitigation: None required.

Cumulative Impacts

Impact GEO-3: The Project, when combined with other past, present, existing, approved, pending and reasonably foreseeable development in the vicinity, would not result in significant cumulative impacts with respect to geology, soils or seismicity. (Less than Significant)

Geographic Context

Although the entire Bay Area is situated within a seismically-active region with a wide range of geologic and soil conditions, these conditions can vary widely within a short distance, making the cumulative context for potential impacts resulting from exposing people and structures to related risks one that is more localized or even site-specific. Potential cumulative geology and seismic impacts do not extend far beyond a project's boundaries, since such geological impacts are typically confined to discrete spatial locations and do not combine to create an extensive cumulative impact. The exception to this generalization would occur where a large geologic feature (e.g., fault zone, massive landslide) might affect an extensive area, or where the development effects from the Project could affect the geology of an offsite location. These circumstances are not likely to occur as there are no large landslide features or fault zones. The Project could combine with structural damage from other past, present, and reasonably foreseeable future projects. These include but are not limited to projects described in Chapter 4, Section 4.07, *Cumulative Development*, of this Draft EIR.

Impacts

The cumulative analysis considers the Project combined with other past, present, existing, pending and reasonably foreseeable projects. Many existing buildings (i.e., past projects) in the surrounding area have been built in accordance with building code requirements for geotechnical and seismic safety in effect at the time of building construction. Present, pending and future projects within the project vicinity are subject to these enhanced requirements and result in reduced geologic and seismic hazards. As present and future projects replace aging infrastructure and older structures with new, more rigorously regulated projects, the potential for cumulative seismic risks is incrementally reduced over time.

The SCAs discussed above, including appropriate grading requirements, and compliance with the UBC as locally amended would reduce the potential for cumulative geologic and seismic effects from development on the project site and surrounding area. Therefore, the Project together with the impact of past, present, existing, pending and reasonably foreseeable future development would not result in any significant cumulative geologic and seismic impacts. Moreover, given that the Project would construct a new structure in compliance with current and future building code requirements for geologic and seismic safety, the Project would not make any considerable contribution to any potential cumulative impact. The impact would be less than significant.

Mitigation: None required.

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4.6 Greenhouse Gases and Climate Change

This section presents an overview of region-specific information related to greenhouse gases (GHG), including a description of current emissions generated within the City. The impact analysis discusses the expected emissions associated with the development of the Project. Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary. An analysis of the contribution of the Project to global climate change and GHG emissions is also included at the end of this section as is an assessment of consistency with relevant plans to reduce GHG emissions.

4.6.1 Physical Setting for GHG Emissions and Climate Change

There is a general scientific consensus that global climate change is occurring, caused in whole or in part, by increased emissions of GHGs that keep the Earth's surface warm by trapping heat in the Earth's atmosphere (USEPA, 2000), in much the same way as glass in a greenhouse. While many studies show evidence of warming over the last century and predict future global warming, the precise causes of such warming and its potential effects are far less certain.[1] While the greenhouse effect is responsible for maintaining a habitable climate on Earth, human activity has caused increased concentrations of these gases in the atmosphere, contributing to an increase in global temperatures and alterations of climactic conditions.

The USEPA has recently concluded that scientists have a good understanding of the following relationship and data supporting the following:

- "Human activities are changing the composition of Earth's atmosphere. Increasing levels of greenhouse gases like carbon dioxide (CO_2) in the atmosphere since pre-industrial times are well-documented."
- The atmospheric buildup of CO_2 and other greenhouse gases is largely the result of human activities such as the burning of fossil fuels.
- A warming trend of approximately 0.7 to 1.5°F occurred during the 20th century. Warming occurred in both the northern and southern hemispheres, and over the oceans.
- "The key greenhouse gases emitted by human activities remain in the atmosphere for periods ranging from decades to centuries." It is therefore virtually certain that atmospheric concentrations of greenhouse gases will continue to rise over the next few decades. Increasing greenhouse gas concentrations tend to warm the planet (USEPA, 2000).

At the same time, there is much uncertainty concerning the magnitude and rate of the warming. Specifically, the USEPA notes that "important scientific questions remain about how much warming will occur; how fast it will occur; and how the warming will affect the rest of the

1 "Global climate change" is a broad term used to describe any worldwide, long-term change in the earth's climate. "Global warming" is more specific and refers to a general increase in temperatures across the earth, although it can cause other climatic changes, such as a shift in the frequency and intensity of weather events and even cooler temperatures in certain areas, even though the world, on average, is warmer.

climate system, including precipitation patterns and storms. Answering these questions will require advances in scientific knowledge in a number of areas:

- Improving understanding of natural climatic variations, changes in the sun's energy, land-use changes, the warming or cooling effects of pollutant aerosols, and the impacts of changing humidity and cloud cover.
- Determining the relative contribution to climate change of human activities and natural causes.
- Projecting future greenhouse emissions and how the climate system will respond within a narrow range.
- Improving understanding of the potential for rapid or abrupt climate change." (USEPA, 2000)

Greenhouse Gases (GHGs)

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are the principal GHGs, and when concentrations of these gases exceed natural concentrations in the atmosphere, the greenhouse effect may be enhanced. CO_2, CH_4 and N_2O occur naturally, but are also generated through human activity. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Other human generated GHGs, which have much higher heat-absorption potential than CO_2, include fluorinated gases such as hydrofluorocarbons (HFCs), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6) which are byproducts of certain industrial processes.

Potential Effects of Human Activity on GHG Emissions

Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions (and thus substantial increases in atmospheric concentrations). In 1994, atmospheric CO_2 concentrations were found to have increased by nearly 30 percent above pre-industrial (c.1860) concentrations.

The effect each GHG has on climate change is measured as a combination of the volume of its emissions, and its global warming potential (GWP),[2] and is expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG emissions are typically measured in terms of pounds or tons of CO_2e.[3]

Global Emissions

Worldwide emissions of GHGs in 2004 were 30 billion tons of CO_2e per year (UNFCCC, 2007) (including both ongoing emissions from industrial and agricultural sources, but excluding emissions from land-use changes).

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2 The potential of a gas or aerosol to trap heat in the atmosphere.

3 CO_2 equivalents ("CO_2e") are calculated as the product of the mass emitted of a given GHG and its specific global warming potential (GWP). While CH_4 and N_2O have much higher GWPs than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO_2e, both from residential developments and human activity in general.

U.S. Emissions

In 2004, the United States emitted about 8 billion tons of CO_2e or about 25 tons/year/person. Of the four major sectors nationwide — residential, commercial, industrial and transportation — transportation accounts for the highest fraction of GHG emissions (approximately 35 to 40 percent); these emissions are entirely generated from direct fossil fuel combustion (USEPA, 2000).

State of California Emissions

In 2004, California emitted approximately 550 million tons of CO_2e, or about six percent of the U.S. emissions. This large number is due primarily to the sheer size of California compared to other states. By contrast, California has one of the fourth lowest per capita GHG emission rates in the country, due to the success of its energy-efficiency and renewable energy programs and commitments that have lowered the State's GHG emissions rate of growth by more than half of what it would have been otherwise (California Energy Commission [CEC], 2007). Another factor that has reduced California's fuel use and GHG emissions is its mild climate compared to that of many other states.

The California Environmental Protection Agency (EPA) Climate Action Team stated in its March 2006 report that the composition of gross climate change pollutant emissions in California in 2002 (expressed in terms of CO_2 equivalence) were as follows:

- Carbon dioxide (CO_2) accounted for 83.3 percent;
- Methane (CH_4) accounted for 6.4 percent;
- Nitrous oxide (N_2O) accounted for 6.8 percent; and
- Fluorinated gases (HFCs, PFC, and SF_6) accounted for 3.5 percent (CalEPA, 2006).

The CEC found that transportation is the source of approximately 41 percent of the State's GHG emissions, followed by electricity generation (both in-state and out-of-state) at 23 percent, and industrial sources at 20 percent. Agriculture and forestry is the source of approximately 8.3 percent, as is the source categorized as "other," which includes residential and commercial activities (CEC, 2007).

Bay Area Emissions

In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of the Bay Area's GHG emissions, accounting for just over half of the Bay Area's 85 million tons of GHG emissions in 2002. Industrial and commercial sources were the second largest contributors of GHG emissions with about 25 percent of total emissions. Domestic sources (e.g., home water heaters, furnaces, etc.) account for about 11 percent of the Bay Area's GHG emissions, followed by power plants at seven percent. Oil refining currently accounts for approximately six percent of the total Bay Area GHG emissions (BAAQMD, 2008).

Oakland Emissions

The City of Oakland has developed a GHG emissions inventory estimating citywide GHG emissions for the year 2005 (City of Oakland Energy and Climate Action Plan Appendix, 2011).

This citywide GHG emissions inventory includes "local government focus area" emissions associated with energy used and waste produced within the Oakland city limits, as well as other emission sources associated with activities occurring in Oakland, such as industrial point sources, energy used to convey water to Oakland, pass-through highway travel, and energy used to manufacture products purchased and used in Oakland. **Table 4.6-1** describes Oakland's local government focus area emissions.

TABLE 4.6-1
OAKLAND FOCUS AREA CITYWIDE GHG EMISSIONS SUMMARY – 2005 (tons/year)

GHG Emissions Source	Metric Tons of Carbon Dioxide Equivalent (CO_2e)
Transportation on Local (Non-Highway) Roads	759,884
Commercial/Industrial Electricity	320,151
Commercial/Industrial Natural Gas	288,514
Residential Electricity	150,077
Residential Natural Gas	350,162
Landfilled Solid Waste	126,361

SOURCE: City of Oakland, 2009.

Construction and New Development Emissions

The construction and operation of developments, such as the Shops at Uptown Retail Project, cause GHG emissions. Operational phase GHG emissions result from energy use associated with heating, lighting and powering buildings (typically through natural gas and electricity consumption in Oakland), pumping and processing water, as well as fuel used for transportation and decomposition of waste associated with building occupants.

New development can also create GHG emissions in its construction and demolition phases including the use of fuels in construction equipment, creation and decomposition of building materials, vegetation clearing, natural gas usage, electrical usage (since electricity generation by conventional means is a major contributor of GHG emissions, discussed below), and transportation.

However, it is important to acknowledge that new development does not necessarily create entirely new GHG emissions, since most of the persons who will visit or occupy new development will come from other locations where they were already causing such GHG emissions. Further, as discussed above, it has not been demonstrated that a project's net increase in GHG emissions, if any, when coupled with other activities in the region, would be cumulatively considerable.

Potential Effects of Human Activity on Global Climate Change

Globally, climate change has the potential to impact numerous environmental resources through anticipated, though uncertain, impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. A warming of about 0.2°C (0.36°F) per decade is projected, and there are identifiable signs that global warming is taking place, including substantial loss of ice in the Arctic (International Panel on Climate Change [IPCC], 2000).

Acknowledging uncertainties regarding the rate at which anthropogenic GHG emissions would continue to increase (based upon various factors under human control, such as future population growth and the locations of that growth; the amount, type, and locations of economic development; the amount, type, and locations of technological advancement; adoption of alternative energy sources; legislative and public initiatives to curb emissions; and public awareness and acceptance of methods for reducing emissions), and the impact of such emissions on climate change, the IPCC devised a set of six “emission scenarios” which utilize various assumptions about the rates of economic development, population growth, and technological advancement over the course of the next century (IPCC, 2000). These emission scenarios are paired with various climate sensitivity models to attempt to account for the range of uncertainties which affect climate change projections. The wide range of temperature, precipitation, and similar projections yielded by these scenarios and models reveal the magnitude of uncertainty presently limiting climate scientists’ ability to project long-range climate change (as previously discussed).

The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects, according to the IPCC (IPCC, 2000):

- Snow cover is projected to contract, with permafrost areas sustaining thawing;
- Sea ice is projected to shrink in both the Arctic and Antarctic;
- Hot extremes, heat waves, and heavy precipitation events are likely to increase in frequency;
- Future tropical cyclones (typhoons and hurricanes) will likely become more intense;
- Non-tropical storm tracks are projected to move poleward, with consequent changes in wind, precipitation, and temperature patterns. Increases in the amount of precipitation are very likely in high-latitudes, while decreases are likely in most subtropical regions; and
- Warming is expected to be greatest over land and at most high northern latitudes, and least over the Southern Ocean and parts of the North Atlantic Ocean.

Potential secondary effects from global warming include global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.

Potential Effects of Climate Change on State of California

According to the CARB, some of the potential impacts in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CARB, 2006). Several recent studies have attempted to explore the possible negative consequences that climate change, left unchecked, could have in California. These reports acknowledge that climate scientists’ understanding of the complex global climate system, and the interplay of the various internal and external factors that affect climate change, remains too limited to yield scientifically valid conclusions on such a localized scale. Substantial work has been done at the international and national level to evaluate climatic impacts, but far less information is available on regional and local impacts. In addition, projecting regional impacts of climate change and variability relies on large-scale scenarios of changing climate parameters, using information that is typically at too general a scale to make accurate regional assessments (Kiparsky, 2003).

Below is a summary of some of the potential effects reported in an array of studies that could be experienced in California as a result of global warming and climate change:

- ***Air Quality.*** Higher temperatures, conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. For other pollutants, the effects of climate change and/or weather are less well studied, and even less well understood (USEPA, 2000). If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thus ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the State (California Climate Change Center [CCCC], 2006).

- ***Water Supply.*** Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. For example, models that predict drier conditions (i.e., parallel climate model [PCM]) suggest decreased reservoir inflows and storage and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions (i.e., HadCM2) project increased reservoir inflows and storage, and increased river flows (Brekke, et al., 2004). A July 2006 technical report prepared by the California Department of Water Resources (DWR) addresses the State Water Project (SWP), the Central Valley Project, and the Sacramento-San Joaquin Delta. Although the report projects that “[c]limate change will likely have a significant effect on California’s future water resources . . . [and] future water demand,” it also reports that “much uncertainty about future water demand [remains], especially [for] those aspects of future demand that will be directly affected by climate change and warming. While climate change is expected to continue through at least the end of this century, the magnitude and, in some cases, the nature of future changes is uncertain. This uncertainty serves to complicate the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood (DWR, 2006).” DWR adds that “[i]t is unlikely that this level of uncertainty will diminish significantly in the foreseeable future (DWR, 2006).” Still, changes in water supply are expected to occur, and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows (Kiparsky, 2003; Cayan et al., 2006). Water purveyors, such as the East Bay Municipal Utilities District (EBMUD), are required by state law to prepare Urban Water Management Plans (UWMPs) (discussed below, under Regulatory Context for Greenhouse Gas Emissions and Climate Change) that consider climatic variations and corresponding impacts on long-term water supplies (California Water Code, Section 10631[c]). DWR has published a 2005 SWP Delivery Reliability Report, which presents information from computer simulations of the SWP operations based on historical data over a 73-year period (1922–1994). The DWR notes that the results of those model studies “represent the best available assessment of the delivery capability of the SWP." In addition, the DWR is continuing to update its studies and analysis of water supplies. EBMUD would incorporate this information from DWR in its update of its current UWMP 2005 (required every five years per the California Water Code), and information from the UWMP can be incorporated into Water Supply Assessments (WSAs) and Water Verifications prepared for certain development projects in accordance with California Water Code Section 10910, et seq. and California Government Code Section 66473.7, et seq. (See Section 4.13, *Utilities and Service Systems*, in this EIR for a discussion of the WSA.)

- ***Hydrology.*** As discussed above, climate change could potentially affect the following: the amount of snowfall, rainfall and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes—expansion of sea water as the oceans warm and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could also jeopardize California's water supply. In particular, saltwater intrusion would threaten the quality and reliability of the state's major fresh water supply that is pumped from the southern portion of the Sacramento/San Joaquin River Delta. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

- ***Agriculture.*** California has a $30 billion agricultural industry that produces half the country's fruits and vegetables. The CCCC notes that higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase, crop-yield could be threatened by a less reliable water supply, and greater ozone pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year that certain crops, such as wine grapes, bloom or ripen, and thus affect their quality (CCCC, 2006).

- ***Ecosystems and Wildlife.*** As noted in the City's adopted Energy and Climate Action Plan, climate change is projected to impose significant ecological, health, economic and quality of life risks on Oakland, many of which are similar to those faced by other communities in the region and throughout the state. Projected local impacts of climate change include rising Bay and Delta waters: increased vulnerability to flood events; increased fire danger; greater frequency and intensity of heat events; added stress on infrastructure; significantly decreased snowpack in the Sierra Mountains (the source of most of Oakland's potable water supply); higher prices for food and fuels; and other ecological and quality of life impacts. Current dependence on fossil fuels not only creates GHG emissions, but imposes other risks associated with energy security, environmental impacts (e.g., recent Gulf oil spill), and vulnerability to energy price volatility. These risks are magnified for economically disadvantaged communities. Some impacts, such as minor sea level rise, are already starting to be observed.

  The State Climate Action Team has predicted that sea levels may rise between 12 and 36 inches by the end of this century (California Climate Action Team, 2010). A set of climate scenarios prepared for the California Energy Commission project that mean sea level along the California coast could rise by as much as 4.5 feet by 2100 (CEC, 2009). According to maps produced by the Bay Conservation and Development Commission (BCDC) and Oakland-based Pacific Institute, many low-elevation areas of Oakland would be vulnerable to flood events under these scenarios (BCDC, 2011).

4.6.2 Regulatory Context for GHG Emissions and Climate Change

Global climate change is addressed through the efforts of various federal, State, regional, and local government agencies as well as national and international scientific and governmental conventions and programs. These agencies work jointly, as well as individually, to understand and regulate the effects of greenhouse gas emissions and resulting climate change through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies, conventions and programs focused on global climate change are discussed below.

International and Federal

Kyoto Protocol. The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC) (signed on March 21, 1994). The Kyoto Protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. It has been estimated that if the commitments outlined in the Kyoto Protocol are met, global GHG emissions could be reduced by an estimated five percent from 1990 levels during the first commitment period of 2008–2012. It should be noted that although the United States is a signatory to the Kyoto Protocol, Congress has not ratified the Protocol and the United States is not bound by the Protocol's commitments.

Copenhagen Summit. The 2009 United Nations Climate Change Conference, i.e., Copenhagen Summit, was held in Denmark in December 2009. The conference included the 15th Conference of the Parties (COP 15) to the United Nations Framework Convention on Climate Change and the 5th Meeting of the Parties (COP/MOP 5) to the Kyoto Protocol. A framework for climate change mitigation beyond 2012 was to be agreed there. The Copenhagen Accord was drafted by the US, China, India, Brazil and South Africa on December 18, and judged a "meaningful agreement" by the United States government. It was "taken note of", but not "adopted", in a debate of all the participating countries the next day, and it was not passed unanimously. The document recognized that climate change is one of the greatest challenges of the present day and that actions should be taken to keep any temperature increases to below 2°C. The document is not legally binding and does not contain any legally binding commitments for reducing CO_2 emissions.

Climate Change Technology Program. The United States has opted for a voluntary and incentive-based approach toward emissions reductions in lieu of the Kyoto Protocol's mandatory framework. The Climate Change Technology Program (CCTP) is a multi-agency research and development coordination effort (which is led by the Secretaries of Energy and Commerce) that is charged with carrying out the President's National Climate Change Technology Initiative (CCTP, 2006).

U.S. Environmental Protection Agency (USEPA). The U.S. Supreme Court held that the United States Environmental Protection Agency (USEPA) must consider regulation of motor vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency* et al., 12 states and cities, including California, together with several environmental organizations, sued to require the U.S. EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438

(2007)). The Supreme Court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and the U.S. EPA had the authority to regulate GHGs.

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- ***Endangerment Finding:*** The current and projected concentrations of the six key well-mixed GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations.

- ***Cause or Contribute Finding:*** The combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

On September 22, 2009, the U.S. EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required the U.S. EPA to develop "…mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy…." The Reporting Rule will apply to most entities that emit 25,000 metric tons of CO_2e or more per year. Starting in 2010, facility owners are required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also mandates recordkeeping and administrative requirements in order for the U.S. EPA to verify annual GHG emissions reports.

State of California

AB 1493 and Amended "Pavley" Regulations. On July 1, 2002, the California Assembly passed Bill 1493 (AB 1493) (signed into law on July 22, 2002), requiring the CARB to "adopt regulations that achieve the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." The regulations were to be adopted by January 1, 2005, and apply to 2009 and later model-year vehicles. In September 2004, CARB responded by adopting "CO_2e fleet average emission" standards. The standards will be phased in from 2009 to 2016, reducing emissions by 22 percent in the "near term" (2009–2012) and 30 percent in the "mid term" (2013–2016), as compared to 2002 fleets.

Executive Order (E.O.) S-3-05. On June 1, 2005, Governor Arnold Schwarzenegger signed E.O. S-3-05, establishing statewide GHG emission reduction targets. This E.O. provides that by 2010, emissions shall be reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent below 1990 levels. The Secretary of the California EPA is charged with coordinating oversight of efforts to meet these targets and formed the Climate Action Team (CAT) to carry out the E.O. Several of the programs developed by the CAT to meet the emission targets are relevant to residential construction and are outlined in a March 2006 report (California EPA, 2006). These include prohibition of idling of certain classes of construction vehicles, provision of recycling facilities within residential buildings and communities, compliance with the CEC's building and appliance energy efficiency standards, compliance with California's Green Buildings and Solar initiatives, and implementation of water-saving technologies and features.

AB 32. On August 31, 2006, the California Assembly passed Bill 32 (AB 32) (signed into law on September 27, 2006), the California Global Warming Solutions Act of 2006. AB 32 commits California to reduce GHG emissions to 1990 levels by 2020 and establishes a multi-year regulatory process under the jurisdiction of the CARB to establish regulations to achieve these goals. The regulations shall require monitoring and annual reporting of GHG emissions from selected sectors or categories of emitters of GHGs. By January 1, 2008, CARB was required to adopt a statewide GHG emissions limit equivalent to the statewide GHG emissions levels in 1990, which must be achieved by 2020. CARB has adopted numerous rules and regulations including the low carbon fuel standard, the renewable portfolio standard, and renewable electricity standard, among others which became operative prior to January 1, 2012, to achieve the maximum technologically feasible and cost-effective GHG emission reductions.

On April 20, 2007, CARB published *Proposed Early Actions to Mitigate Climate Change in California* (CARB, 2007a). There are no early action measures specific to residential development included in the list of 36 measures identified for CARB to pursue during calendar years 2007, 2008, and 2009. Also, this publication indicated that the issue of GHG emissions in CEQA and General Plans was being deferred for later action, so the publication did not discuss any early action measures generally related to CEQA or to land use decisions. As noted in that report, "AB 32 requires that all GHG reduction measures adopted and implemented by the Air Resources Board be technologically feasible and cost effective (California EPA, 2007a)." The law permits the use of market-based compliance mechanisms to achieve those reductions and also requires that GHG measures have neither negative impacts on conventional pollutant controls nor any disproportionate socioeconomic effects (among other criteria).

On December 11, 2008, CARB adopted its *Climate Change Scoping Plan* (Scoping Plan), which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations (CARB, 2008). The Scoping Plan contains the main strategies California will implement to reduce CO_2e emissions by 174 million metric tons (MMT), or approximately 30 percent, from the state's projected 2020 emissions level of 596 MMT of CO_2e under a business-as-usual scenario. The Scoping Plan also breaks down the amount of GHG emissions reductions CARB recommends for each emissions sector of the state's GHG inventory. While CARB has identified a GHG reduction target of 15 percent for local governments themselves, it has not yet determined what amount of GHG emissions reductions it recommends from local government land use decisions. However, the Scoping Plan does state that successful implementation of the plan relies on local governments' land use planning and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions. CARB further acknowledges that decisions on how land is used will have large effects on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The land use measures approved by CARB and required pursuant to Senate Bill 375 have been developed and are in the process of environmental review in 2013. The Scoping Plan also includes recommended measures that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities. These measures, shown below in **Table 4.6-2** by sector, also put the state on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80 percent below 1990 levels.

California Senate Bill 1368 (SB 1368). On August 31, 2006, the California Senate passed SB 1368 (signed into law on September 29, 2006), which required the Public Utilities Commission (PUC) to develop and adopt a "greenhouse gases emission performance standard" by February 1, 2007, for the private electric utilities under its regulation. The PUC adopted an interim standard on January 25, 2007, but formally requested a delay until September 30, 2007, for the local publicly-owned electric utilities under its regulation. These standards apply to all long-term financial commitments entered into by electric utilities. The CEC adopted a consistent standard in August, 2007. (Natural Resources Defense Council [NRDC], 2007)

California Senate Bill 97 (SB 97). Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is a prominent environmental issue requiring analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Natural Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, no later than July 1, 2009. The California Natural Resources Agency was required to certify or adopt those guidelines by January 1, 2010. On December 30, 2009, the Natural Resources Agency adopted the state CEQA Guidelines amendments, as required by SB 97. These state CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments became effective March 18, 2010.

California Senate Bill 375 (SB 375). In addition to policy directly guided by AB 32, the legislature in 2008 passed SB 375, which provides for regional coordination in land use and transportation planning and funding to help meet the AB 32 GHG reduction goals. SB 375 aligns regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires Regional Transportation Plans (RTPs) developed by the state's 18 metropolitan planning organizations (MPOs) to incorporate a "sustainable communities strategy" (SCS) that will achieve GHG emission reduction targets set by the CARB. SB 375 also includes provisions for streamlined CEQA review for some infill projects, such as transit-oriented development. SB 375 would be implemented over the next several years.

The Metropolitan Transportation Commission (MTC) is responsible for developing the SCS and the RTPs for the San Francisco Bay Area. MTC's 2013 RTP will be its first plan subject to SB 375 and is currently undergoing environmental review under CEQA.

TABLE 4.6-2
LIST OF RECOMMENDED ACTIONS BY SECTOR IN THE CARB SCOPING PLAN

Measure No.	Measure Description	GHG Reductions (Annual MMT CO_2e)
Transportation		
T-1	Pavley I and II – Light Duty Vehicle Greenhouse Gas Standards	31.7
T-2	Low Carbon Fuel Standard (Discrete Early Action)	15
T-3[a]	Regional Transportation-Related Greenhouse Gas Targets	5
T-4	Vehicle Efficiency Measures	4.5
T-5	Ship Electrification at Ports (Discrete Early Action)	0.2
T-6	Goods Movement Efficiency Measures. • Ship Electrification at Ports • System-Wide Efficiency Improvements	3.5
T-7	Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Measure – Aerodynamic Efficiency (Discrete Early Action)	0.93
T-8	Medium- and Heavy-Duty Vehicle Hybridization	0.5
T-9	High Speed Rail	1
Electricity and Natural Gas		
E-1	Energy Efficiency (32,000 GWh of Reduced Demand) • Increased Utility Energy Efficiency Programs • More Stringent Building & Appliance Standards Additional Efficiency and Conservation Programs	15.2
E-2	Increase Combined Heat and Power Use by 30,000 GWh (Net reductions include avoided transmission line loss)	6.7
E-3	Renewables Portfolio Standard (33% by 2020)	21.3
E-4	Million Solar Roofs (including California Solar Initiative, New Solar Homes Partnership and solar programs of publicly owned utilities) • Target of 3000 MW Total Installation by 2020	2.1
CR-1	Energy Efficiency (800 Million Therms Reduced Consumptions) • Utility Energy Efficiency Programs • Building and Appliance Standards • Additional Efficiency and Conservation Programs	4.3
CR-2	Solar Water Heating (AB 1470 goal)	0.1
Green Buildings		
GB-1	Green Buildings	26
Water		
W-1	Water Use Efficiency	1.4†
W-2	Water Recycling	0.3†
W-3	Water System Energy Efficiency	2.0†
W-4	Reuse Urban Runoff	0.2†
W-5	Increase Renewable Energy Production	0.9†
W-6	Public Goods Charge (Water)	TBD†
Industry		
I-1	Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	TBD
I-2	Oil and Gas Extraction GHG Emission Reduction	0.2
I-3	GHG Leak Reduction from Oil and Gas Transmission	0.9
I-4	Refinery Flare Recovery Process Improvements	0.3
I-5	Removal of Methane Exemption from Existing Refinery Regulations	0.01

[a] This is not the SB 375 regional target. CARB will establish regional targets for each MPO region following the input of the regional targets advisory committee and a consultation process with MPO's and other stakeholders per SB 375
† GHG emission reduction estimates are not included in calculating the total reductions needed to meet the 2020 target

California Urban Water Management Act. The California Urban Water Management Planning Act requires various water purveyors throughout the State of California (such as EBMUD) to prepare UWMPs, which assess the purveyor's water supplies and demands over a 20-year horizon (California Water Code, Section 10631 *et seq*.). As required by that statute, UWMPs are updated by the purveyors every five years. As discussed above, this is relevant to global climate change which may affect future water supplies in California, as conditions may become drier or wetter, affecting reservoir inflows and storage and increased river flows (Brekke, 2004).

Bay Area Air Quality Management District (BAAQMD). The BAAQMD is responsible for improving air quality within the San Francisco Bay Area Basin. The BAAQMD's prior CEQA Guidelines, which were last updated in 1999, contained no thresholds of significance for GHG emissions. In May of 2011 the BAAQMD adopted new Thresholds of Significance (2011 Thresholds). Subsequently, the Alameda Superior Court required the BAAQMD to conduct additional environmental review in connection with its adoption of the thresholds. The 2011 Thresholds of Significance of the BAAQMD identified a project-specific threshold of 1,100 metric tons per year, and an efficiency-based threshold of 4.6 metric tons per year per service population (residents and employees) as resulting in a cumulatively considerable contribution of GHG emission and a cumulatively significant impact to global climate change.

City of Oakland

Oakland Energy and Climate Action Plan

An Oakland Energy and Climate Action Plan (ECAP) has been developed to identify, evaluate and recommend prioritized actions to reduce energy consumption and GHG emissions in Oakland. The ECAP identifies energy and climate goals, clarifies policy direction, and identifies priority actions for reducing energy use and GHG emissions. On July 7, 2009, the Oakland City Council directed staff to develop the draft Oakland ECAP using a GHG reduction target equivalent to 36 percent below 2005 GHG emissions by 2020 (City of Oakland, Resolution No. 82129 C.M.S., 2009). The City adopted the ECAP on December 4, 2012.

The ECAP outlines a ten year plan including more than 150 actions that will enable Oakland to achieve a 36% reduction in GHG emissions with respect to each of these GHG sources. Oakland can accomplish this goal by 2020 through:

- 20% reduction in vehicle miles traveled annually as residents, workers and visitors meet daily needs by walking, bicycling, and using transit;
- 24 million gallons of oil saved annually due to less driving and more fuel efficient vehicles on local roads
- 32% decrease in electricity consumption through renewable generation, conservation and energy efficiency
- 14% decrease in natural gas consumption through building retrofits, solar hot water projects and conservation
- 62 million kWh and 2.7 million therms annually of new renewable energy used to meet local needs

- 375,000 tons of waste diverted away from local landfills through waste reduction, reuse, recycling, and composting

The ECAP also recommends a Three Year Priority Implementation Plan; a prioritized subset of actions recommended for implementation in the next three years. These priority actions will capitalize on near term opportunities and lay the groundwork for long term progress. Some of the recommended priority actions can be implemented with existing and anticipated resources. Others will require the identification of new, in some cases significant, resources to move forward.

City of Oakland General Plan

Land Use and Transportation Element (LUTE). The LUTE (which includes the Pedestrian Master Plan and Bicycle Master Plan) of the Oakland General Plan contains the following policies that address issues related to GHG emissions and climate change:

- ***Policy T.2.1:*** Transit-oriented development should be encouraged at existing or proposed transit nodes, defined by the convergence of two or more modes of public transit such as BART, bus, shuttle service, light rail or electric trolley, ferry, and inter-city or commuter rail.
- ***Policy T.2.2:*** Transit-oriented developments should be pedestrian-oriented, encourage night and day time use, provide the neighborhood with needed goods and services, contain a mix of land uses, and be designed to be compatible with the character of surrounding neighborhoods.
- ***Policy T3.5:*** The City should include bikeways and pedestrian ways in the planning of new, reconstructed, or realigned streets, wherever possible.
- ***Policy T3.6:*** The City should encourage and promote use of public transit in Oakland by expediting the movement of and access to transit vehicles on designated “transit streets” as shown on the Transportation Plan.
- ***Policy T4.2:*** Through cooperation with other agencies, the City should create incentives to encourage travelers to use alternative transportation options.
- ***Policy N3.2:*** In order to facilitate the construction of needed housing units, infill development that is consistent with the General Plan should take place throughout the City of Oakland.
- ***Policy T4.5:*** The City should prepare, adopt, and implement a Bicycle and Pedestrian Master Plan as a part of the Transportation Element of [the] General Plan.

Open Space, Conservation and Recreation Element (OSCAR). The OSCAR Element includes policies that address GHG reduction and global climate change. Listed below are the following types of OCASR policies: policies that encourage the provision of open space, which increases vegetation area (trees, grass, landscaping, etc.) to effect cooler climate, reduce excessive solar gain, and absorb CO_2; policies that encourage stormwater management, which relates to the maintenance of floodplains and infrastructure to accommodate potential increased storms and flooding; and policies that encourage energy efficiency and use of alternative energy sources, which directly address reducing GHG emissions.

- ***Policy OS-1.1:*** Conserve existing City and Regional Parks characterized by steep slopes, large groundwater recharge areas, native plant and animal communities, extreme fire hazards, or similar conditions.

- ***Policy OS-2.1:*** Manage Oakland's urban parks to protect and enhance their open space character while accommodating a wide range of outdoor recreational activities.

- ***Policy CO-5.3:*** Employ a broad range of strategies, compatible with the Alameda Countywide Clean Water Program.

- ***Policy CO-12.1:*** Promote land use patterns and densities which help improve regional air quality conditions by: (a) minimizing dependence on single passenger autos; (b) promoting projects which minimize quick auto starts and stops, such as live-work development, mixed use development, and office development with ground floor retail space; (c) separating land uses which are sensitive to pollution from the sources of air pollution; and (d) supporting telecommuting, flexible work hours, and behavioral changes which reduce the percentage of people in Oakland who must drive to work on a daily basis.

- ***Policy CO-12.3:*** Expand existing transportation systems management and transportation demand management strategies which reduce congestion, vehicle idling, and travel in single passenger autos.

- ***Policy CO-12.4:*** Require that development projects be designed in a manner which reduces potential adverse air quality impacts. This may include: (a) the use of vegetation and landscaping to absorb carbon monoxide and to buffer sensitive receptors; (b) the use of low-polluting energy sources and energy conservation measures; and (c) designs which encourage transit use and facilitate bicycle and pedestrian travel.

- ***Policy CO-12.5:*** Require new industry to use best available control technology to remove pollutants, including filtering, washing, or electrostatic treatment of emissions.

- ***Policy CO-13.2:*** Support public information campaigns, energy audits, the use of energy-saving appliances and vehicles, and other efforts which help Oakland residents, businesses, and City operations become more energy efficient.

- ***Policy CO-13.3:*** Encourage the use of energy-efficient construction and building materials. Encourage site plans for new development which maximize energy efficiency.

- ***Policy CO-13.4:*** Accommodate the development and use of alternative energy resources, including solar energy and technologies which convert waste or industrial byproducts to energy, provided that such activities are compatible with surrounding land uses and regional air and water quality requirements.

Historic Preservation Element (HPE). A key HPE policy relevant to climate change encourages the reuse of existing building (and building materials) resources, which could reduce landfill material (a source of methane, a GHG), avoid the incineration of materials (which produces CO_2 as a by-product), avoid the need to transport materials to disposal sites (which produces GHG emissions), and eliminate the need for materials to be replaced by new product (which often requires the use of fossil fuels to obtain raw and manufacture new material) (USEPA, 2006).

Safety Element. Safety Element policies that address wildfire hazards related to climate change in that increased temperatures could increase fire risk in areas that become drier due to climate change (USEPA, 2012). Also, wildfire results in the loss of vegetation; carbon is stored in vegetation, and when the vegetation burns, the carbon returns to the atmosphere (NASA, 2004). The occurrence of wildfire also emits particulate matters into the atmosphere. Safety Element policies also address storm-induced flooding hazards related to the potential to accommodate potential increase in storms and flooding as a result of climate change. Pertinent Safety Element policies including the following:

- ***Policy FI-3:*** Prioritize the reduction of the wildfire hazard, with an emphasis on prevention.
- ***Policy FL-1:*** Enforce and update local ordinances and comply with regional orders that would reduce the risk of storm-induced flooding.
- ***Policy FL-2:*** Continue or strengthen city programs that seek to minimize the storm-induced flooding hazard.

Other City of Oakland Programs and Policies

The City of Oakland has supported and adopted a number of programs and policies designed to reduce GHG emissions and continue Oakland's progress toward becoming a model sustainable city. Other programs and policies of relevance to the Project include:

- ***Sustainable Oakland Program.*** Oakland's sustainability efforts are coordinated through the Sustainable Oakland program, a product of the Oakland Sustainability Community Development Initiative (SDI) created in 1998 (Ordinance 74678 C.M.S.).
- ***Green Building.*** The City of Oakland adopted mandatory green building standards for private development projects on October 19, 2010 (13040 C.M.S.). The following project types are included in the green building ordinance:
    - Residential New Construction
    - Residential Additions and Alterations
    - Non-Residential New Construction
    - Non-Residential Additions and Alterations
    - Removal of a Historic Resource and New Construction
    - Historic Residential Additions and Alterations
    - Historic Non-Residential Additions and Alterations
    - Mixed Use Construction
    - Construction Requiring a Landscape Plan

  All buildings or projects must comply with all requirements of the 2008 California Building Energy Efficiency Standards as well as meet a variety of checklist requirements.
- ***Downtown Housing.*** The 10K Downtown Housing Initiative has a goal of attracting 10,000 new residents to downtown Oakland by encouraging the development of 6,000 market-rate housing units. This effort is consistent with Smart Growth principles.
- ***Waste Reduction and Recycling.*** The City of Oakland has implemented a residential recycling program increasing collection of yard trimmings and food waste. This program has increased total yard trimming collections by 46 percent compared to 2004, and

recycling tonnage by 37 percent. The City also adopted Construction and Demolition Recycling, for which the City passed a resolution in July 2000 (Ordinance 12253. OMC Chapter 15.34), requiring certain nonresidential or apartment house projects to recycle 100 percent of all Asphalt & Concrete (A/C) materials and 65 percent of all other materials.

- ***Polystyrene Foam Ban Ordinance.*** In June 2006 the Oakland City Council passed the Green Food Service Ware Ordinance (Ordinance 14727, effective as of January 1, 2007), which prohibits the use of polystyrene foam disposable food service ware and requires, when cost neutral, the use of biodegradable or compostable disposable food service ware by food vendors and City facilities.

- ***Zero Waste Resolution.*** In March 2006, the Oakland City Council adopted a Zero Waste Goal by 2020 Resolution (Resolution 79774 C.M.S.), and commissioned the creation of a Zero Waste Strategic Plan to achieve the goal.

- ***Stormwater Management.*** On February 19, 2003, the Regional Water Quality Control Board, San Francisco Bay Region, issued a municipal stormwater permit under the National Pollutant Discharge Elimination System (NPDES) permit program to the Alameda Countywide Clean Water Program (ACCWP). The purpose of the permit is to reduce the discharge of pollutants in stormwater to the maximum extent practicable and to effectively prohibit non-stormwater discharges into municipal storm drain systems and watercourses. The City of Oakland, as a member of the ACCWP, is a co-permittee under the ACCWP's permit and is, therefore, subject to the permit requirements.

- ***Provision C.3 of the NPDES permit*** is the section of the permit containing stormwater pollution management requirements for new development and redevelopment projects. Among other things, Provision C.3 requires that certain new development and redevelopment projects incorporate post-construction stormwater pollution management measures, including stormwater treatment measures, stormwater site design measures, and source control measures, to reduce stormwater pollution after the construction of the project. These requirements are in addition to standard stormwater-related best management practices (BMPs) required during construction.

- ***Community Gardens and Farmer's Markets.*** Community Garden locations include Arroyo Viejo, Bella Vista, Bushrod, Golden Gate, Lakeside Horticultural Center, Marston Campbell, Temescal, and Verdese Carter. Weekly Farmer's Markets locations include the Jack London Square, Old Oakland, Grand Lake, Mandela, and Temescal districts. Both efforts promote and facilitate the principal of growing and purchasing locally, which effects reductions in truck and vehicle use and GHG emissions.

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

The City's Standard Conditions of Approval (SCA) that directly pertain to greenhouse gases and that apply to the Project are listed below. If the Project is approved by the City, all applicable SCAs will be adopted as conditions of approval and required of the Project to help ensure no significant impacts occur regarding construction period dust (or emissions). The SCA are incorporated and required as part of the Project, so they are not listed as mitigation measures.

- **GHG SCA 1: Greenhouse Gas (GHG) Reduction Plan**

  Prior to issuance of a construction-related permit and ongoing as specified. The project applicant shall retain a qualified air quality consultant to develop a Greenhouse Gas (GHG) Reduction Plan for City review and approval. The applicant shall implement the approved GHG Reduction Plan.

  The goal of the GHG Reduction Plan shall be to increase energy efficiency and reduce GHG emissions to below at least one of the City of Oakland's CEQA Thresholds of Significance (1,100 metric tons of CO_2e per year or 4.6 metric tons of CO_2e per year per service population) AND to reduce GHG emissions by 36 percent below the project's "adjusted" baseline GHG emissions (as explained below) to help achieve the City's goal of reducing GHG emissions. The GHG Reduction Plan shall include, at a minimum, (a) a detailed GHG emissions inventory for the project under a "business-as-usual" scenario with no consideration of project design features, or other energy efficiencies, (b) an "adjusted" baseline GHG emissions inventory for the project, taking into consideration energy efficiencies included as part of the project (including the City's Standard Conditions of Approval, proposed mitigation measures, project design features, and other City requirements), (c) a comprehensive set of quantified additional GHG reduction measures available to further reduce GHG emissions beyond the adjusted GHG emissions, and (d) requirements for ongoing monitoring and reporting to demonstrate that the additional GHG reduction measures are being implemented. If the project is to be constructed in phases, the GHG Reduction Plan shall provide GHG emission scenarios by phase.

  Specifically**,** the applicant/sponsor shall adhere to the following:

  a) *GHG Reduction Measures Program.* Prepare and submit to the City Planning Director or his/her designee for review and approval a GHG Reduction Plan that specifies and quantifies GHG reduction measures that the project will implement by phase.

     Potential GHG reduction measures to be considered include, but are not be limited to, measures recommended in BAAQMD's latest CEQA Air Quality Guidelines, the California Air Resources Board Scoping Plan (December 2008, as may be revised), the California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures Document (August 2010, as may be revised), the California Attorney General's website, and Reference Guides on Leadership in Energy and Environmental Design (LEED) published by the U.S. Green Building Council.

     The proposed GHG reduction measures must be reviewed and approved by the City Planning Director or his/her designee. The types of allowable GHG reduction measures include the following (listed in order of City preference): (1) physical design features; (2) operational features; and (3) the payment of fees to fund GHG-reducing programs (i.e., the purchase of "offset carbon credits," pursuant to item "b" below).

     The allowable locations of the GHG reduction measures include the following (listed in order of City preference): (1) the project site; (2) off-site within the City of Oakland; (3) off-site within the San Francisco Bay Area Air Basin; (4) off-site within the State of California; then (5) elsewhere in the United States.

  b) *Offset Carbon Credits Guidelines*. For GHG reduction measures involving the purchase of offset carbon credits, evidence of the payment/purchase shall be submitted to the City Planning Director or his/her designee for review and approval prior to completion of the project (or prior to completion of the project phase, if the project includes more one phase).

As with preferred locations for the implementation of all GHG reductions measures, the preference for offset carbon credit purchases include those that can be achieved as follows (listed in order of City preference): (1) within the City of Oakland; (2) within the San Francisco Bay Area Air Basin; (3) within the State of California; then (4) elsewhere in the United States. The cost of offset carbon credit purchases shall be based on current market value at the time purchased and shall be based on the Project's operational emissions estimated in the GHG Reduction Plan or subsequent approved emissions inventory, which may result in emissions that are higher or lower than those estimated in the GHG Reduction Plan.

c) *Plan Implementation and Documentation*. For physical GHG reduction measures to be incorporated into the design of the project, the measures shall be included on the drawings submitted for construction-related permits. For operational GHG reduction measures to be incorporated into the project, the measures shall be implemented on an indefinite and ongoing basis beginning at the time of project completion (or at the completion of the project phase for phased projects).

For physical GHG reduction measures to be incorporated into off-site projects, the measures shall be included on drawings and submitted to the City Planning Director or his/her designee for review and approval and then installed prior to completion of the subject project (or prior to completion of the project phase for phased projects). For operational GHG reduction measures to be incorporated into off-site projects, the measures shall be implemented on an indefinite and ongoing basis beginning at the time of completion of the subject project (or at the completion of the project phase for phased projects).

d) *Compliance, Monitoring and Reporting*. Upon City review and approval of the GHG Reduction Plan program by phase, the applicant/sponsor shall satisfy the following requirements for ongoing monitoring and reporting to demonstrate that the additional GHG reduction measures are being implemented. The GHG Reduction Plan requires regular periodic evaluation over the life of the Project (generally estimated to be at least 40 years) to determine how the Plan is achieving required GHG emissions reductions over time, as well as the efficacy of the specific additional GHG reduction measures identified in the Plan.

Implementation of the GHG reduction measures and related requirements shall be ensured through the project applicant/sponsor's compliance with Conditions of Approval adopted for the project. Generally, starting two years after the City issues the first Certificate of Occupancy for the project, the project applicant/sponsor shall prepare each year of the useful life of the project an Annual GHG Emissions Reduction Report (Annual Report), subject to the City Planning Director or his/her designee for review and approval. The Annual Report shall be submitted to an independent reviewer of the City Planning Director's or his/her designee's choosing, to be paid for by the project applicant/sponsor (see Funding, below), within two months of the anniversary of the Certificate of Occupancy.

The Annual Report shall summarize the project's implementation of GHG reduction measures over the preceding year, intended upcoming changes, compliance with the conditions of the Plan, and include a brief summary of the previous year's Annual Report results (starting the second year). The Annual Report shall include a comparison of annual project emissions to the baseline emissions reported in the GHG Plan.

The GHG Reduction Plan shall be considered fully attained when project emissions are less than either applicable numeric BAAQMD CEQA Thresholds AND GHG emissions are 36 percent below the project's "adjusted" baseline GHG emissions, as confirmed by the City Planning Director or his/her designee through an established monitoring program. Monitoring and reporting activities will continue at the City's discretion, as discussed below.

e) *Funding*. Within two months after the Certificate of Occupancy, the project applicant/sponsor shall fund an escrow-type account or endowment fund to be used exclusively for preparation of Annual Reports and review and evaluation by the City Planning Director or his/her designee, or its selected peer reviewers. The escrow-type account shall be initially funded by the project applicant/sponsor in an amount determined by the City Planning Director or his/her designee and shall be replenished by the project applicant/sponsor so that the amount does not fall below an amount determined by the City Planning Director or his/her designee. The mechanism of this account shall be mutually agreed upon by the project applicant/sponsor and the City Planning Director or his/her designee, including the ability of the City to access the funds if the project applicant/sponsor is not complying with the GHG Reduction Plan requirements, and/or to reimburse the City for its monitoring and enforcement costs.

f) *Corrective Procedure*. If the third Annual Report, or any report thereafter, indicates that, in spite of the implementation of the GHG Reduction Plan, the project is not achieving the GHG reduction goal, the project applicant/sponsor shall prepare a report for City review and approval, which proposes additional or revised GHG measures to better achieve the GHG emissions reduction goals, including without limitation, a discussion on the feasibility and effectiveness of the menu of other additional measures (Corrective GHG Action Plan). The project applicant/sponsor shall then implement the approved Corrective GHG Action Plan.

If, one year after the Corrective GHG Action Plan is implemented, the required GHG emissions reduction target is still not being achieved, or if the project applicant/owner fails to submit a report at the times described above, or if the reports do not meet City requirements outlined above, the City Planning Director or his/her designee may, in addition to its other remedies, (a) assess the project applicant/sponsor a financial penalty based upon actual percentage reduction in GHG emissions as compared to the percent reduction in GHG emissions established in the GHG Reduction Plan; or (b) refer the matter to the City Planning Commission for scheduling of a compliance hearing to determine whether the project's approvals should be revoked, altered or additional conditions of approval imposed.

The penalty as described in (a) above shall be determined by the City Planning Director or his/her designee and be commensurate with the percentage GHG emissions reduction not achieved (compared to the applicable numeric significance thresholds) or required percentage reduction from the "adjusted" baseline.

In determining whether a financial penalty or other remedy is appropriate, the City shall not impose a penalty if the project applicant/sponsor has made a good faith effort to comply with the GHG Reduction Plan.

The City would only have the ability to impose a monetary penalty after a reasonable cure period and in accordance with the enforcement process outlined in Planning Code

Chapter 17.152. If a financial penalty is imposed, such penalty sums shall be used by the City solely toward the implementation of the GHG Reduction Plan.

g) *Timeline Discretion and Summary*. The City Planning Director or his/her designee shall have the discretion to reasonably modify the timing of reporting, with reasonable notice and opportunity to comment by the applicant, to coincide with other related monitoring and reporting required for the project.

- Fund Escrow-type Account for City Review: Certificate of Occupancy plus 2 months
- Submit Baseline Inventory of "Actual Adjusted Emissions": Certificate of Occupancy plus 1 year
- Submit Annual Report #1: Certificate of Occupancy plus 2 years
- Submit Corrective GHG Action Plan (if needed): Certificate of Occupancy plus 4 years (based on findings of Annual Report #3)
- Post Attainment Annual Reports: Minimum every 3 years and at the City Planning Director's or his/her designee's reasonable discretion

In addition, other SCA that pertain to greenhouse gases and that apply to the Project are listed in other sections of this EIR and described below.

4.6.3 Impacts and Mitigation Measures

Significance Thresholds for GHG and Climate Change

The Project would have a significant impact on the environment if it were to:

Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, specifically:

a) For a project involving a land use development, produce total emissions of more than 1,100 metric tons of CO_2e annually **AND** more than 4.6 metric tons of CO_2e per service population annually. The service population includes both the residents and the employees of the project. The project's impact would be considered significant if the emissions exceed **BOTH** the 1,100 metric tons threshold and the 4.6 metric tons threshold. Accordingly, the impact would be considered less than significant if the project's emissions are below **EITHER** of these thresholds.

b) Fundamentally conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing greenhouse gas emissions.

Approach to CEQA Analysis of GHG Emissions and Climate Change Impacts in this EIR

The analysis of potential GHG impacts uses the methodology identified by the BAAQMD, the regional agency primarily responsible for developing air quality plans for the Bay Area, including the City of Oakland. This methodology is outlined in the BAAQMD document *California Environmental Quality Act Air Quality Guidelines* (BAAQMD, 2012). This analysis considers the construction and operational emissions from the development of the Project and, consistent with

BAAQMD's Air Quality Guidelines, represents adequate environmental analysis under CEQA for individual development projects.

Quantitative and Qualitative Approach

This EIR uses both a quantitative and a qualitative approach. The quantitative approach is used to answer the first threshold: would the Project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. The quantitative threshold discussed above is used to determine if this threshold is met.

The qualitative approach addresses the second threshold: would the Project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. Theoretically, if a project implements reduction strategies identified in AB 32, the Governor's E.O. Section-3-05, or other strategies to help toward reducing GHGs to the level proposed by the Governor and targeted by the City of Oakland, it could reasonably follow that the project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. Alternatively, a project could reduce a potential cumulative contribution to GHG emissions through energy efficiency features, density and locale (e.g., compact development near transit and activity nodes of work or shopping) and by contributing to available mitigation programs, such as reforestation, tree planting, or carbon trading.

GHG emissions resulting from the Project were estimated using the CalEEMod emissions estimator Model version 2011.1.1, the latest version available at the time of the EIR. The transportation analysis estimates that the Project would result in approximately 3,385 net new vehicle trips per day after accounting for pass-by trips. Trip lengths for commercial customer trips were adjusted to be consistent with assumptions for other recent and similar developments within Oakland and to reflect the presence of numerous similar commercial uses in proximity to the project site. The CalEEMod also makes adjustments for implementation of Pavley vehicle standards and Low Carbon Fuel Standards. CalEEMod printout sheets detailing the average trip length assumed for each trip type, and research supporting these assumptions, is provided in Appendix C.

The Project would generate GHG emissions from an increase in both stationary sources and mobile sources. Mobile sources account for the majority of Project GHG emissions. Area and indirect sources associated with the Project would primarily result from electrical usage, water and wastewater transport and solid waste generation. GHG emissions from electrical usage are generated when energy consumed on the site is generated by fuel combustion. GHG emissions from water and wastewater transport are also indirect emissions resulting from the energy required to transport water from its source, and the energy required to treat wastewater and transport it to its treated discharge point. Solid waste emissions are generated when the increased waste generated by the Project are taken to a landfill to decompose. GHG emissions from electrical usage, water and wastewater conveyance, and solid waste were estimated using CalEEMod.

Net Change in Emissions and Local/Global Context

The methodology applied in this EIR assumes that all emission sources associated with the Project would be new sources that would combine with existing conditions. For this assessment, it is not possible to predict whether emission sources associated with the Project would move from outside the air basin (and thus generate "new" emissions within the air basin), or whether they are sources that already exist and are merely relocated within the air basin. Because the effects of GHGs are global, if the Project merely shifts the location of the GHG-emitting activities (locations of residences and businesses and where people drive), there would not be a net new increase of emissions.

The GHG analysis presented herein takes into account growth and increased vehicle travel within the regional context, which is the regional air basin and cumulative development, as described in Section 4.07.2, *Cumulative Context*, in the beginning of Chapter 4 in this Draft EIR. Therefore, there is no separate cumulative analysis section with regard to GHG emissions and consistency with related plans.

GHG Effects on Flooding and Sea-level Rise

The project site is not located in an area that may be subject to coastal or other flooding resulting from climate change, (the nearest coastal shoreline is along the Oakland Estuary). The potential effects of climate change (e.g., effects of flooding on the project site due to sea level rise) on the Project are discussed in Section 4.8, *Hydrology and Water Quality*, of this EIR.

Impacts

Impact GHG-1: The Project would produce greenhouse gas emissions that exceed 1,100 metric tons of CO_{2e} per year and that would exceed 4.6 metric tons of CO_2e per service population annually (Criterion 1). (Conservatively identified as Significant and Unavoidable)

Construction and operation of the Project would generate GHG emissions, with the majority of energy consumption (and associated generation of GHG emissions) occurring during operation. Typically more than 80 percent of the total energy consumption takes place during the use of buildings and less than 20 percent are consumed during construction (United Nations Environmental Programme [UNEP], 2007). Overall, the following activities associated with the Project could contribute to the generation of GHG emissions:

- ***Motor Vehicle Use.*** Transportation associated with the Project would result in GHG emissions from the combustion of fossil fuels in daily automobile and truck trips.
- ***Gas, Electric and Water Use.*** Natural gas use results in the emissions of two GHGs: methane (the major component of natural gas) and carbon dioxide from the combustion of natural gas. Methane is released prior to initiation of combustion of the natural gas (as before a flame on a stove is sparked), and from the small amount of methane that is uncombusted in a natural gas flame. Electricity use can result in GHG production if the electricity is generated by combusting fossil fuel. California's water conveyance system is energy intensive (CEC, 2005).
- ***Removal of Vegetation.*** The net removal of vegetation for construction results in a loss of the carbon sequestration in plants. However, planting of additional vegetation would result in additional carbon sequestration and lower the carbon footprint of a project. (See City's Standard Conditions of Approval regarding *Landscape Requirements and Tree Replacement*, below).

- ***Construction Activities.*** Construction equipment typically uses fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as carbon dioxide, methane and nitrous oxide. Furthermore, methane is emitted during the fueling of heavy equipment.

While the Project would generate GHG emissions from the activities described above, the City of Oakland's ongoing implementation of its Sustainability Community Development Initiative (which includes an array of programs and measures, discussed above, under Section 4.6.2, *Regulatory Context for GHG Emissions and Climate Change*) would collectively reduce the levels of GHG emissions and contributions to global climate change attributable to activities throughout Oakland.

GHG Emission Inventory for Development

The following emission sources are included in the adjusted GHG emissions inventory for the Project, if applicable, are described below (and quantified in **Table 4.6-3**):

- ***Area Source Emissions.*** These are direct emissions from sources that include natural gas combustion for fireplaces or boilers, as well as emissions from landscape maintenance equipment.
- ***Transportation Emissions.*** These are direct emissions from mobile sources including automobiles, trucks, motorcycles, and buses.
- ***Operational Electricity Consumption.*** These are indirect emissions emitted off-site via non-renewable, non-nuclear electricity generators as a result of increased electrical demand.

  Solid Waste Disposal Emissions. These are indirect emissions associated with waste generation. A large percentage of project waste could be diverted from landfills by waste reduction, recycling, and composting. Oakland currently diverts a large portion of its waste and has goals to even further reduce the amount of waste sent to a landfill. The remainder of the waste not diverted would be disposed of at a landfill. Landfills emit anthropogenic methane from the anaerobic breakdown of material.
- ***Operational Water Emissions (embedded energy).*** These indirect emissions are associated with the electricity used to convey water, due to increased water demand from the Project.
- ***Operational Wastewater (non-biogenic).*** These are indirect emissions from wastewater treatment associated with the electricity use in wastewater treatment (and not the biogenic CO_2 process emissions).
- ***Refrigerant Leakage.*** The use of refrigeration systems commonly used in grocery stores, for example, results in leakage of some of the charged refrigerant. Common refrigerants typically have a high global warming potential (GWP). Project specific information about the type and amount of refrigerant that would be used in the Project and considering existing Sprout's stores in operation (740 pounds of R-407A) was used to estimate the total amount of refrigerant leakage from the proposed store (up to 15 percent annually). The GWP indicates, on a pound for pound basis, the potency of the refrigerant compared to carbon dioxide (2,107 GWP). Multiplying the pounds of refrigerant by the GWP results in the GHG emissions from refrigeration leakage in terms of CO_2e per year.[4]

[4] 740 pounds of R-407A times 15 percent leakage rate equals 111 pounds of R-407A annually. The 111 pounds time 2,107 GWP, then divided by one tonne (2,205 pounds), totals approximately 106 MT CO2e of refrigerant leakage annually.

TABLE 4.6-3
GHG EMISSIONS INVENTORY FROM DEVELOPMENT FOR THE PROJECT – "BUSINESS AS USUAL" AND ADJUSTED[a,b]

	Total "Business as Usual" Annual CO_2e Emissions (metric tons per year)	Total Regulatory Adjusted Annual CO_2e Emissions (metric tons per year)	Total City Program Adjusted Annual CO_2e Emissions (metric tons per year)
Emission Source			
Motor vehicle trips[c]	1,157	1,028	1,028
Natural gas	98	72	68
Grid Electricity	350	214	212
Wastewater & Treatment & Conveyance	12	7	7
Solid Waste	71	71	71
Area Source (landscape maintenance)	0	0	0
Refrigerant Leakage[d]	106	106	106
Total Operational Project GHG Emissions without Construction Emissions	1,794	1,498	1,492
Construction Emissions per Year (annualized over 40 years)	18	18	18
Total Operational Project GHG Emissions with Construction Emissions	**1,812**	**1,516**	**1,510**
Project -level Threshold of Significance	*1,100*	*1,100*	*1,100*
Exceeds Threshold?	***Yes***	***Yes***	***Yes***
Total Project GHG Emissions by Service Population (76 employee increase) including Construction Emissions	**23.8**	**19.9**	**19.9**
Project-level Threshold of Significance	*4.6*	*4.6*	*4.6*
Exceeds Project-level Threshold?	***Yes***	***Yes***	***Yes***

a "Business as Usual" emissions primarily represent emission levels without implementation of post-AB32 regulatory efforts to control GHGs, such as the Pavley fuel efficiency standards and the low carbon fuel standard. These vehicle emissions-related standards are reflected in the adjusted emissions, which also consider energy efficiency measures (affecting natural gas and electricity) from the AB 32 Scoping Plan.

b Adjusted emissions reductions reflect AB 32 Scoping Plan Measures for energy efficiency that result in improved PG&E emission factors and applicant-specific natural gas and water demand for supermarket land use.

c The transportation analysis estimates that the Project would result in approximately 3,385 net new vehicle trips per day after accounting for use of transit, bicycling, walking and pass-by trips. Trip lengths for commercial customer trips were adjusted to be consistent with assumptions for other recent and similar developments within Oakland and to reflect the presence of numerous similar commercial uses in proximity to the project site. CalEEMod printout sheets detailing the average trip length assumed for each trip type, and research supporting these assumptions, is provided in Appendix C.

d Refrigerant leakage for the Project is estimated based on the amount of refrigerant anticipated to be charged (740 pounds), along with an anticipated leakage rate of 15 percent. This amount has then been converted to CO_2e based on the global warming potential (GWP) of 2,107 for the proposed refrigerant, R-407A.

e Total operational and construction GHG emissions, divided by estimated population of 76 employees associated with the Project.

Emission sources that are not included in the BAAQMD Guidelines or relevant to the Project are not included in the adjusted GHG emissions inventory. These sources include emissions generated from permitted stationary source equipment, vegetation sequestration change, life cycle emissions, agricultural emissions; and off road equipment emissions.

City Standard Conditions of Approval, Regulatory Requirements, General Plan Policies and Local Programs, and Design Features that Reduce GHG Emissions of the Project

There are many ways for the Project to reduce its GHG emissions through its design, construction and operations. Local conditions of approval, policies, programs and regulatory requirements that apply to a project also combine to reduce project GHG emissions. Table 4.6-3, above, also presents the adjusted emissions estimated for the analysis of the Project that incorporates potential reductions that may occur from implementing local conditions of approval, policies, programs and regulatory requirements (e.g., GHG Emissions Reduction Plan, Transportation Demand Management [TDM] Plan, Green Building Compliance, etc.). The adjusted emissions also reflect regulatory efforts to control GHGs, such as the statewide Pavley fuel efficiency standard, the low carbon fuel standard, and energy efficiency measures for electricity and natural gas specified in the AB 32 Scoping Plan. Each of the considerations factored in the adjusted emissions inventory in Table 4.6-3 is discussed below.

The SCA relevant to reducing GHG emissions and climate change impacts due to the Project are described below and listed either above or in other sections of this EIR.

- **GHG SCA 1: GHG Reduction Plan**

  GHG SCA 1 applies to projects of a certain minimum size that produce total GHG emissions that exceed both of the BAAQMD CEQA Thresholds (1,100 metric tons of CO_2e annually or 4.6 metric tons of CO_2e per service population annually), and therefore do not result in a significant impact requiring mitigation. GHG SCA 1 requires a project applicant to prepare a GHG Reduction Plan to increase energy efficiency and reduce GHG emissions to the greatest extent feasible below the BAAQMD CEQA Thresholds. The GHG Reduction Plan will include a comprehensive set of quantified GHG emissions reduction measures in addition to energy efficiencies included as part of the project (including the City's SCAs, proposed mitigation measures, project design features, and other City requirements). The complete text of GHG SCA 1 is presented in the *Regulatory Context*, above.

- **GHG SCA 2: Green Building for Residential Structures and Non-residential Structures**

  GHG SCA 2 applies to new construction of non-residential buildings over 25,000 square feet of total floor area. GHG SCA 2 requires that the applicant comply with the requirements of the California Green Building Standards (CALGreen) mandatory measures and the applicable requirements of the Green Building Ordinance. GHG SCA 2 is initially presented in Section 4.14, *Utilities and Service Systems*. The Green Building Ordinance establishes checklist requirements for developers based on LEED or Build it Green. LEED certification requires a 10 percent reduction in the Title 24 energy standards which are reflected in Table 4.6-3.

- **GHG SCA 3: Green Building for Building and Landscape Projects**

  GHG SCA 3 applies to certain projects that would construct relatively small non-residential land uses or modification of existing uses. GHG SCA 3 requires that the applicant comply with the requirements of the California Green Building Standards (CALGreen) mandatory measures and the applicable requirements of the Green Building Ordinance. GHG SCA 3 is initially presented in Section 4.13, *Utilities and Service Systems*. The City Program adjusted emissions in Table 4.6-3 reflect GHG savings from application of CALgreen mandatory measures.

- **TRANS SCA 1: Parking and Transportation Demand Management**

  This Standard Condition of Approval, which affects air quality emissions, applies to the Project because it would generate 50 or more net new AM or PM peak-hour vehicle trips, and is stated in full in the assessment of traffic in Section 4.12, *Transportation and Circulation*.

- **UTIL SCA 1: Waste Reduction and Recycling**

  UTIL SCA 1 requires a project applicant to submit a Construction & Demolition Waste Reduction and Recycling Plan (WRRP) and an Operational Diversion Plan (ODP) for review and approval by the Oakland Public Works Agency. Chapter 15.34 of the Oakland Municipal Code outlines requirements for reducing waste and optimizing construction and demolition (C&D) recycling. Affected projects include all new construction and all demolition. UTIL SCA 1 is fully presented in Section 4.13, *Utilities and Service Systems*. No appreciable reductions were considered for this SCA as construction waste is largely inert and not considered as a GHG emission source by CalEEMod.

- **Several SCAs Regarding Landscape Requirements and Tree Replacement**

  Several SCAs address landscape requirements for frontages of commercial buildings and replacement of trees removed as part of a project. Projects are required to install one tree for every 25 feet of street frontage in cases where sidewalks have adequate width. Additionally, SCAs generally require the replacement of native trees removed as part of a project. Together, these SCAs maintain and increase landscaping and trees, create a cooler climate, reduce excessive solar gain, and absorb CO_2e emissions for a contribution to emission reductions, but have no impact on the emissions inventory of the Project. AES SCA 1is initially presented in Section 4.1, *Aesthetics, Shadow and Wind*, of this Draft EIR; and BIO SCA 3 is initially presented in Section 4.3, *Biological Resources*. Insufficient data is available to estimate a potential GHG reduction from implementation of this SCA.

- **Several SCAs Regarding Stormwater Management**

  Consistent with regional stormwater management programs and requirements that projects must comply with, the City has several SCAs that aim to reduce post construction stormwater runoff that could affect the ability to accommodate potentially increased storms and flooding within existing floodplains and infrastructure systems. These SCAs are relevant as climate change can result in increased flooding due to warmer climate (e.g., earlier and greater melting of snowpack) and inadequate infrastructure. GEO SCA 1is initially presented in Section 4.5, *Geology, Soils, and Geohazards*; and HYD SCA 1 is initially presented in Section 4.8, *Hydrology and Water Quality*.

General Plan Policies and City Programs

Each of the following policies and programs were previously discussed in general in *Regulatory Context for GHG Emissions and Climate Change,* in this Section.

- ***Oakland General Plan LUTE.*** The LUTE is aimed at promoting use of public transit, bicycles and pedestrian travel. Any reduction of transportation-related GHG emissions would be captured in the trip reduction associated with the transportation analysis used as the basis for calculating mobile source emissions.

- ***Oakland General Plan Open Space, Conservation and Recreation (OSCAR) Element.*** The OSCAR contains policies that (a) encourage the provision of open space, which increases vegetation area (trees, grass, landscaping, etc.) to effect cooler climate, reduce excessive solar gain, and absorb CO_2; (b) encourage stormwater management, which relates to the maintenance of floodplains and infrastructure to accommodate potential increased storms and flooding; and (c) encourage energy efficiency and use of alternative energy sources. Policies that address vegetation area have no impact on the emissions inventory as vegetative sequestration is not a component of BAAQMD's Guidelines Other policies regarding energy efficiency encourage and support energy efficiency but are not requirements under any implementation mechanism via the General Plan. They have resulted, however, in the implementation of the City of Oakland sustainability program discussed below.

- ***City of Oakland Sustainability Programs.*** The City has proactively adopted a number of sustainability programs in an effort to reduce the City's impact on climate change. Oakland's sustainability efforts are managed by the Oakland Sustainability Community Development Initiative and there are two main categories that relate to reducing GHG emissions from a development project: renewable energy and green building.

  Renewable Energy. With regard to renewable energy, the City's Sustainability Program has set a priority of promoting renewable energy with a particular emphasis on solar generation. The Program's aggressive renewable energy goals include the following: 50 percent of city facilities entire electricity use from renewable sources by 2017; and 100 percent of the city's entire electricity use from renewable sources by 2030. The City has some control over renewable energy percentages for buildings it operates by contracting its energy needs directly with the local utility. However, private building operators generally receive a standard energy mix from PG&E, and would not be required to contract for a higher percentage of renewables under this program as it only targets city facilities. PG&E has requested a 33 percent renewable energy mix goal for 2020 from the CPUC (compared to a 12 percent mix in 2007).

  Green Building. With regard to green building strategies, the City of Oakland has implemented green building principles in City buildings through the following programs: Civic Green Building Ordinance (Ordinance No. 12658 C.M.S., 2005), requiring, for certain large civic projects, techniques that minimize the environmental and health impacts of the built environment through energy, water and material efficiencies and improved indoor air quality, while also reducing the waste associated with construction, maintenance and remodeling over the life of the building; Green Building Guidelines (Resolution No. 79871, 2006) which provides guidelines to Alameda County residents and developers regarding construction and remodeling; and Green Building Education Incentives for private developers. The City of Oakland adopted mandatory green building standards for private development projects on October 19, 2010. The City Program adjusted emissions in Table 4.6-3 reflect GHG savings from implementation of green building requirements.

Construction-generated GHG Emissions

The construction-generated GHG emissions of the Project were estimated based on construction equipment provided by the applicant and area estimates of the CalEEMod model. Construction was assumed to begin in 2014 and occur over a 12 month period as estimated by the applicant. An estimated total of approximately **715 metric tons (MT) of CO_2e** would be emitted over the assumed construction period in 2014.

Construction emissions are annualized because the proposed operational GHG emissions thresholds are analyzed in terms of metric tons "per year." Assuming a 40-year development life of the project before the development is demolished or remodeled for energy efficiency (which is the common standard currently used in practice), total construction emissions represent approximately **18 MT CO_2e annually, over 40 years**.

As previously discussed, the BAAQMD Guidelines do not include a specific threshold or methodology for assessing construction-related GHG emissions for CEQA analysis. The City's methodology adds the 40-year annualized construction-related GHG emissions to a project's total operational-related emissions, to assess construction-related GHG emissions against the City of Oakland's thresholds and a project's ability to meet AB 32 GHG reduction goals, as discussed below.

The analysis of construction emissions only considers improvements in construction equipment exhaust emissions through manufacturer requirements and turnover. In addition to considering the CO_2e emission from construction activities, the Project would incorporate dust control measures recommended by BAAQMD (AQ SCA 1, *Construction-Related Air Pollution Controls)*, which includes measures related to construction exhaust emissions. Further, the SCAs that apply to the Project would align with BAAQMD regulations that relate to portable equipment (e.g., concrete batch plants, and gasoline- or diesel-powered engines used for power generation, pumps, compressors, pile drivers, and cranes), architectural coatings, and paving materials. Equipment used during project construction would be subject to the requirements of BAAQMD Regulation 2 (Permits), Rule 1 (General Requirements) with respect to portable equipment unless exempt under Rule 2-1-105 (Exemption, Registered Statewide Portable Equipment); BAAQMD Regulation 8 (Organic Compounds), Rule 3 (Architectural Coatings); and BAAQMD Regulation 8 (Organic Compounds), Rule 15 (Emulsified and Liquid Asphalts).

Project construction activities would be required to implement these measures. Construction of the Project would not disrupt or hinder implementation of these reduction measures. In summary, the annualized GHG emissions from construction of the proposed Project would not conflict with the goals of AB 32.

Long-Term Operational GHG Emissions

As introduced above, long-term operational GHG emissions associated with the Project include indirect emissions from mobile sources (motor vehicle trips), emissions from natural gas combustion used in non-residential buildings, emissions from electricity use in non-residential buildings (grid electricity), emissions from water conveyance and waste water treatment and conveyance, and emissions from area sources. Emissions from each of these sources, in addition to the construction-related emissions discussed above, are reported in Table 4.6-3.

"Business as Usual" emissions shown in Table 4.6-3 do not consider any GHG reduction measures or compliance with local or statewide policies, plans and programs and regulations aimed at reducing GHG emissions. These "business as usual" emissions are provided to demonstrate how emissions from the Project would be reduced even with the implementation of the most basic measures and adherence to regulatory requirements.

As previously discussed under *City Standard Conditions of Approval, Regulatory Requirements, General Plan Policies and Local Programs, and Design Features that Reduce GHG Emissions of the Proposed Project*, the adjusted operational GHG emissions include regulatory requirements such as implementation of Pavley GHG standards and the Low Carbon Fuel Standard (LCFS) for motor vehicles and other reduction measures from the AB 32 Scoping Plan.

As shown in Table 4.6-3, the total adjusted annual GHG emissions generated by the Project, including emissions from construction associated with that development, is approximately **1,510 MT CO_2e per year** (approximately 17 percent less than "business as usual" emissions). Total emissions and service population (residents and employees) generated by the Project would result in approximately **19.9 MT CO_2e per service population annually** (approximately 16 percent less than "business as usual" emissions). Based on the project-level significance thresholds, the Project would have a significant impact because it would produce total emissions that exceed 1,100 MT of CO_2e as well as 4.6 MT of CO_2e per service population annually.

Applicability of GHG SCA 1

Adherence to the City's SCAs and other policies cited above would reduce the GHG emissions of the Project. In particular, as previously discussed, GHG SCA 1, *GHG Reduction Plan*, applies to certain projects and has the goal of increasing energy efficiency and reducing GHG emissions to the greatest extent feasible below **either** applicable numeric City of Oakland CEQA Thresholds (i.e., total emissions and per service population) to help achieve the City's goal of reducing GHG emissions. The GHG Reduction Plan shall be considered fully attained when project emissions are less than either applicable numeric City CEQA Thresholds.

Specifically, GHG SCA 1 would apply to the Project as a Scenario A project.

- ***Scenario A*****:** Projects which (a) involve a land use development (i.e., a project that does not require a BAAQMD permit to operate), (b) exceed the GHG emissions screening criteria contained in the BAAQMD CEQA Guidelines, AND (c) after a GHG analysis is prepared would exceed ***both*** applicable numeric City of Oakland CEQA Thresholds.
- ***Scenario B*****:** Projects which (a) involve a land use development, (b) exceed the GHG emissions screening criteria contained in the BAAQMD CEQA Guidelines, (c) after a GHG analysis is prepared would exceed one of the applicable numeric City of Oakland CEQA Thresholds, AND (d) are considered to be "Very Large Projects."[6]

[6] A "Very Large Project" is defined as any of the following:
(A) Residential development of more than 500 dwelling units;
(B) Shopping center or business establishment employing more than 1,000 persons or encompassing more than 500,000 square feet of floor space;
(C) Commercial office building employing more than 1,000 persons or encompassing more than 250,000 square feet of floor space;
(D) Hotel/motel development of more than 500 rooms;
(E) Industrial, manufacturing, processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or encompassing more than 650,000 square feet of floor area; or
(F) Any combination of smaller versions of the above that when combined result in equivalent annual GHG emissions as the above.

- ***Scenario C*:** Projects which (a) involve a stationary source of GHG (i.e., a project that requires a permit from BAAQMD to operate) AND (b) after a GHG analysis is prepared would produce total GHG emissions of more than 10,000 metric tons of CO2e annually.

GHG Reduction Measures Considered

As stated above, GHG SCA 1, *GHG Reduction Plan*, requires a project applicant to consider and employ feasible GHG reduction measures in the Project's physical design and operational features. Available and feasible measures, primarily energy saving measures gained through compliance with green building standards and requirements (GHG SCAs 2 and 3 and Oakland Sustainability Programs, discussed above), are already incorporated as part of the Project as proposed.

Also already incorporated in the GHG assessment of the Project, as previously discussed under *Approach to CEQA Analysis of GHG Emissions and Climate Change Impacts in this EIR*, are adjusted (reduced) commercial customer vehicle trip lengths to reflect the presence of several other grocery stores in proximity (approximately two miles) of the project site and the reasonable deduction that the Project would not draw customers who would drive longer distances to specifically shop at this store; the Project would not be a significant regional draw (see Appendix C). Consistent with this approach, but on a close-in scale, the Project would likely reduce existing daytime customer vehicle trips specifically originating from and returning to the nearby employment hubs on Pill Hill (two blocks away) and Kaiser Permanent Medical Center Campus and Office Building (three to four blocks away). It is likely that these trips currently occur going to other similar grocery stores in the area. However, the extent of these reductions is not specifically quantified in the Project's GHG assessment beyond that reflected by the reduced vehicle trip length discussed above.

The GHG assessment considered several additional GHG reduction measures beyond those incorporated into the Project, however, none were found viable for reducing the GHG emissions for this particular Project. The CARB Scoping Plan identifies some level of GHG reduction with implementation of solar panels (see Table 4.6-2). The square footage of solar panels required to offset a single MT of CO_2e per year is approximately 240 square feet, thus the approximately 74,000 square feet (or 1.7 acres) of solar panels to reduce the Project's emissions to below the significance threshold of 1,000 MT CO_2e annually. (The project site is 1.9 acres.) Although the project applicant may install photovoltaic panels within some portion of the Project, it is not reasonable to assume a considerable reduction of GHG emissions would result.

Although UTIL SCA 1, *Waste Reduction and Recycling*, requires actions for projects to reduce construction waste and optimize C&D recycling, no appreciable GHG reductions were considered for the Project. For operational waste however, the analysis factors in annual tons of landfill waste for the grocery store. It is reasonable to assume that Sprouts' business operations include measures to reduce its waste to landfill by separating compostable material - a growing practice in small specialty grocery stores in particular. As shown in Table 4.6-3, GHG emissions from solid waste to landfill is 71 MT CO_2e annually (approximately five percent of the Project's total annual GHG emissions), whereas a reduction of 411 MT CO_2e annually is needed to reduce the Project's emissions to below the significance threshold of 1,000 MT CO_2e annually. Possible

GHG emission reductions from composting by the Project was not calculated given the Project information available, however, it would not result in a considerable reduction.

The GHG assessment of the Project does incorporate performance measures dedicated to the proper installation and maintenance of the Project's refrigeration system to reduce the level of GHG emissions associated with refrigeration leakage over time. The Project proposes to use a refrigerant that is a non-ozone depleting HFC. The refrigeration system would be computer controlled for maximum energy efficiency, and the compressor units would be centrally located within the store to minimize refrigeration line runs and refrigerant charge. Further, while not factored into the GHG assessment, the proposed grocery store would be designed to meet the silver standards of "Green Chill," the US EPA's Advanced Refrigeration Partnership.

A Parking and Transportation Demand Management (TDM) program (per TRANS SCA-1) that could result in a reduction of automobile trips was considered. However, a TDM program may not be as effective for smaller retail commercial developments that have few employees to effect substantial reductions in vehicle use to/from work (such as Sprouts); a TDM program would be more effective with commercial or mixed use developments with high employee and/or resident population onsite. Thus an associated reduction of mobile emissions was not considered a viable GHG reduction measure (see Section 4.12, *Transportation and Circulation*).

Further related to the employment characteristic of the Project, BAAQMD's efficiency-based threshold developed in 2011 factors the onsite service population (employees and/or residents) of a project into the total annual GHG emissions from that project. While this is presumably an effective threshold to evaluate large projects that have a substantial service population, the efficiency threshold falls short of accurately representing the potentially net positive GHG emissions effect of smaller retail projects. First, by looking solely at service population, the efficiency threshold fails to factor in the relatively high rate of vehicle trip generation and related GHG emissions (see Section 4.12, *Transportation and Circulation*). Thus, the smaller retail grocery store has a high volume of daily business, as well as extended hours of operation, which together equate to high customer volumes despite relatively limited floor area and number of employees. The BAAQMD efficiency threshold also fails to factor in these key characteristic of the small retail grocery store: the total GHG emission are inherently high and the service population is inherently low.

A particular shortcoming of the efficiency threshold in accurately capturing the potentially net positive GHG effect of this Project is that it fails to factor in the context of the project site. As previously described, the Project is infill in an existing mixed use area of established residential neighborhoods (approximately four blocks northwest and two blocks east) and notable employment hubs (Pill Hill two blocks west/northwest and Kaiser Permanente campus three to four blocks north). Theoretically, if the existing nearby residential and employment population was factored as service population, especially those located within a walkable radius of the store (approximately 4-5 blocks or one-quarter mile), the Project's GHG emissions would not likely exceed the 4.6 MT CO_2e per service population threshold. The development is also located within a priority development area with respect to the Sustainable Communities plan developed for the

Bay Area pursuant to SB 375 which has been implemented to reduce greenhouse gas emissions through the planning process.

In summary, the GHG assessment in this analysis considered several possible GHG reduction measures and project characteristics that could be available for the Project, however, several were determined not to be feasible, or if they were considered feasible, they were not factored into the assessment because the relatively small level of reduction that would be achieved relative to the investment.

Reducing Residual GHG Emissions

Because no additional feasible GHG reduction measure are identified beyond those already quantified in Table 4.6-3, it would be necessary for the project applicant to purchase offsets to reduce the Project's incremental GHG emissions above 1,100 MT of CO_2e per year (approximately 411 MT CO_2e per year) and meet the requirements of GHG SCA 1. The payment of fees to fund off-site GHG-reducing programs would be required pursuant to the guidelines within GHG SCA 1 including the allowable and preferable locations of such measures, provisions of evidence of the payment/purchase, preparation of an Annual GHG Emissions Reduction Report, and funding of an escrow-type account or endowment fund to support the ongoing compliance monitoring and reporting.

Foreseeing the future market for and cost of purchasing carbon credits over 40 years, or even in the nearer term, is not possible at this time with any level of certainty. The potential exists for the cost to become prohibitive in the future and render the Project financially infeasible. However, at this time GHG SCA 1, including namely the purchase of carbon credits, is fully applicable since all other measures that could achieve substantive reductions are considered infeasible or the emissions reduction that would be gained would not be substantial.

At some point in the future, the project sponsor could establish that the continued purchase of carbon credits would no longer be financially feasible, making the Project financially infeasible. Also at some point in the future, the project sponsor could provide actual operating data from the Project (after a certain duration of operation determined by the City) that shows the Project's GHG emissions are lower than estimated in this EIR analysis and at least one of the two significance thresholds. Moreover, if the City revises its SCA related to GHG reduction or adopts new or amended policies or standards for assessing and mitigating GHG emissions impacts, the project sponsor would obtain any benefit of those changes and have the ability to request that the City consider a modification to the Project's conditions of approval to maintain consistent with the current City GHG reduction policies and requirements at that time.

A reduction of 411 MT CO_2e per year is required to reduce the Project's GHG emissions to below significance thresholds. The remaining reduction measure available to address this level of reduction with this Project is the applicant's purchasing of carbon credits pursuant to GHG SCA 1, the ongoing feasibility of which is not certain in the future.

Therefore, because it cannot be guaranteed that GHG SCA 1 would achieve emissions reduction below significance thresholds, the impact is conservatively considered significant and unavoidable.

Mitigation: None available other than GHG SCA-1.

Significance after Mitigation: Conservatively Significant and Unavoidable.

Impact GHG-2: The Project would not conflict with an applicable plan, policy or regulation of an appropriate regulatory agency adopted for the purpose of reducing greenhouse gas emissions (Criterion 2). (Less than Significant)

The Project would not conflict with any applicable plan, policy or regulation adopted with the intent to reduce GHG emissions. The Project would exceed project-level GHG emissions thresholds for determining the consistency of land use development projects with the goals and projections of AB 32. GHG SCA 1 and the implementation of a Greenhouse Gas Reduction Plan would align with existing current plans, policies and regulations adopted to reduce GHG emissions. Specifically, the Project would not conflict with the ECAP, current City Sustainability Programs, or General Plan policies or regulations regarding GHG reductions and other local, regional and statewide plans, policies and regulations (previously discussed in Section 4.6.2, *Regulatory Context for GHG Emissions and Climate Change*) that are related to the reduction of GHG emissions.

Preparation and implementation of project-specific GHG Reduction Plan (GHG SCA 1) would reduce GHG emissions of Project to the greatest extent feasible. As previously discussed in detail for Impact GHG-1, the Project incorporates GHG reduction measures and characteristics. First, it incorporates energy saving measures (consistent with green building standards and requirements and Oakland Sustainability Programs) and, second, it benefits from its infill location within an existing mixed use area in a Sustainable Communities plan priority development area (developed pursuant to SB 375). Third, the proposed grocery's business operations are expected to employ pre-landfill compostable separation practices, as well as practices to ensure the maximum energy efficiency and minimal leakage of its refrigeration system – both of which reduce some portion of the Project's GHG emissions.

Additionally, the Project's infill location reduces the distance that customers would drive in motor vehicles to specifically shop at this store given other existing grocery shopping opportunities within approximately two miles of the project site. Also, the project site is located in direct proximity to the nearby employment hubs (Pill Hill and Kaiser Permanent Medical Center Campus and Office Building) and residential neighborhoods within a walkable radius of the store – generating residents and employees and who contribute to the grocery's high customer volume and benefit from this particular retail grocery within walking distance. Taken together, these locational characteristics of the Project help reduce the potential motor vehicle trips (the overwhelming contributor of the Project's GHG emissions, as shown in Table 4.6-3) to and from the store and thus align the Project with goals and policies to reduce GHG emissions. As, discussed in Impact GHG-1, counter to the BAAQMD efficiency-based (service population) threshold, factoring these locational characteristics of the Project into the quantitative GHG emissions assessment would more accurately capture the potentially net positive GHG effect of this Project (and not likely exceed the 4.6 MT CO_2e per service population threshold.

Other SCAs that would apply to the Project also include conditions to address adherence to best management construction practices and equipment use (AQ SCA 1 and HAZ SCA 2) and minimize post construction stormwater runoff that could affect the ability to accommodate potentially increased storms and flooding within existing floodplains and infrastructure systems (GEO SCA 1, and HYD SCA 1, to increase landscaping to absorb CO2e emissions (AES SCA 1 and BIO SCA 2), and facilitate waste reduction and recycling (UTIL SCA 1). The implementation of each of these would contribute to GHG emissions reductions from the Project.

Overall, the Project would not conflict with applicable plans, policies or regulations adopted with the intent to reduce GHG emissions. The impact would be less than significant.

Mitigation: None Required.

Significance after Mitigation: Less than Significant.

Long-Term Cumulative GHG Emissions

As previously discussed under *Significance Thresholds for GHG and Climate Change*, the GHG analysis presented herein takes into account growth and increased vehicle travel within the regional context, which is the regional air basin and cumulative development, as described in Section 4.07.2, Cumulative Context, in the beginning of Chapter 4 in this Draft EIR. Therefore, there is no separate cumulative analysis section with regard to GHG emissions and consistency with related plans.

4.6.4 References

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4.7 Hazards and Hazardous Materials

This section discusses the hazards and hazardous materials issues associated with Project and describes the environmental and regulatory setting that is applicable to health and safety regarding hazards and hazardous materials. Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary.

4.7.1 Environmental Setting

Definition of Hazardous Materials

A hazardous material is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment (State of California, Health and Safety Code, Chapter 6.95, Section 25501(o). The term “hazardous materials” refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases).

In some cases, past industrial or commercial activities on a site have resulted in spills or leaks of hazardous materials to the ground, resulting in soil and/or groundwater contamination. Hazardous materials may also be present in building materials and released during building demolition activities. If improperly handled, hazardous materials and wastes can cause public health hazards when released to the soil, groundwater, or air. The four basic exposure pathways through which an individual can be exposed to a hazardous material include: inhalation, ingestion, bodily contact, and injection. Exposure can come as a result of an accidental release of hazardous materials during transportation, storage, or handling. Disturbance of contaminated subsurface soil during construction can also cause exposures to workers, the public or the environment through stockpiling, handling, or transportation of soils.

A hazardous waste, for the purpose of this EIR, is any hazardous material that is abandoned, discarded, or recycled, as defined in the State Health and Safety Code (Chapter 6.95, Section 25125). The transportation, use, and disposal of hazardous materials, as well as the potential releases of hazardous materials to the environment, are closely regulated through many state and federal laws.

Soil and Groundwater Contamination

In California, regulatory databases listing hazardous materials sites provided by numerous federal, state, and local agencies are consolidated in the “Cortese List” pursuant to Government Code Section 65962.5. The Cortese List is located on the California Environmental Protection Agency’s (Cal EPA) website and is a compilation of the following lists:

- List of Hazardous Waste and Substances sites from Department of Toxic Substances Control (DTSC) EnviroStor database;
- List of Leaking Underground Storage Tank Sites by County and Fiscal Year from the State Water Resources Control Board (SWRCB) GeoTracker database;
- List of solid waste disposal sites identified by SWRCB with waste constituents above hazardous waste levels outside the waste management unit;
- List of "active" Cease and Desist Order and Cleanup and Abatement Order from the SWRCB; and
- List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by DTSC and listed on their EnviroStor database(Cal EPA, 2013).

Pursuant to Section 15300.2 of the CEQA Guidelines, a categorical exemption shall not be used for a project located on a site included on the Cortese List.

The SWRCB GeoTracker database includes leaking underground storage tanks (LUSTs), permitted underground storage tanks (USTs), and Spills, Leaks, Investigations, and Cleanup Database (SLIC) sites. The DTSC EnviroStor database includes federal and state response sites, voluntary, school, and military cleanups and corrective actions, and permitted sites. The five databases cited above identify sites with suspected and confirmed releases of hazardous materials to the subsurface soil and/or groundwater. The reporting and statuses of these sites change as identification, monitoring and clean-up of hazardous sites progress. Typically, sites are closed once it has been demonstrated that existing site uses combined with the levels of identified contamination present no significant risk to human health or the environment.

There is one LUST site adjacent to the project site (Connell Oldsmobile at 3093 Broadway). In addition, there are eight LUST sites and two listed Cleanup Program Sites within one-half mile upgradient of the project site listed in **Table 4.7-1** below (SWRCB, 2013; DTSC, 2013). Although the upgradient sites may have the potential to affect the project site if the contaminants associated with those sites migrates to within the project site, the upgradient sites are not known to be currently affecting the project site. The list below also includes three known permitted UST sites located upgradient or adjacent to the project site. However, the permitted UST sites are not known to have contamination issues.

Fuel Contamination from Leaking Underground and Aboveground Storage Tanks

A UST system is a storage tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. Until the mid-1980s, most USTs were made of single-walled bare steel, which were found to corrode over time resulting in leakage. Faulty installation or maintenance procedures also lead to UST leakage, in addition to potential releases associated with spills. Recently revised UST regulations have significantly reduced the incidents of UST leakage from new UST systems and the consequential soil and groundwater

TABLE 4.7-1
REGULATORY SITES LISTED IN THE PROJECT VICNITY

Site Name/ Address	Regulatory List	Site Summary
Connell Oldsmobile 3093 Broadway	LUST Cleanup Site	Potential for groundwater contamination. Potential contaminates of concern includes gasoline.
Roy Anderson Paints 3080 Broadway	LUST Cleanup Site	Potential for groundwater contamination. Potential contaminates of concern include waste, motor, hydraulic and lubricating oils.
Chevron #9-1026 3701 Broadway	LUST Cleanup Site	Potential for groundwater and soil contamination. Potential contaminates of concern include benzene, gasoline, waste, motor, hydraulic and lubricating oils.
Robert & Ruth Burrows Trust 260 30th Street	LUST Cleanup Site	Potential media of contamination is unknown. Potential contaminates of concern include waste, motor, hydraulic and lubricating oils.
Val Strough Chevrolet 327 34th Street	LUST Cleanup Site	Potential for groundwater contamination. Potential contaminates of concern includes gasoline.
Chevron #21-1283 3810 Broadway	LUST Cleanup Site	Potential for groundwater and soil contamination. Potential contaminates of concern includes gasoline and waste oil / motor / hydraulic / lubricating.
CHP – Oakland 3601 Telegraph Avenue	LUST Cleanup Site	Potential for groundwater contamination. Potential contaminates of concern includes gasoline.
Glovatorium 3820 Manila Avenue	LUST Cleanup Site	Potential for groundwater contamination. Potential contaminates of concern includes stoddard solvent / mineral spirits / distillates
UNOCAL #3538 411 MacArthur Blvd.	LUST Cleanup Site	Potential for groundwater contamination. Potential contaminates of concern includes gasoline.
Kaiser Hospital 38th Street and Broadway	Cleanup Program Site	Potential affected media and contaminants are under investigation.
Kaiser Medical Center 280 MacArthur Blvd West	Cleanup Program Site	Potential affected media and contaminants are under investigation.
A & P Services Center 398 West MacArthur Blvd	Permitted underground Storage Tank	Permitted site; no known contamination issues
Kaiser Permanente Medical Center 280 MacArthur Blvd West	Permitted underground Storage Tank	Permitted site; no known contamination issues

SOURCES: SWRCB 2013; DTSC 2013.

contamination. However, there are some older UST systems that remain in service and many sites contaminated by leaking USTs that are still under investigation and clean-up. USTs installed prior to the mid-1980s that have leaked as well as improperly installed USTs have resulted in fuel spills can present contamination issues. In addition, it is not uncommon for older USTs to have been abandoned in place with no documentation of location or abandonment technique. As shown on Table 4.7-1 above, there are nine known LUST sites located within the project vicinity that have contamination issues (SWRCB, 2013). These sites are in various stages of investigation by the regulatory agencies and have the potential to affect the project site, but would be increasingly less likely to do so with increasing distance from the project site.

Contamination from Spills and Leaks

Spills and leaks of chemicals can contaminate soil and groundwater when proper precautions are not in place. Various businesses and industries transport, use, and dispose of chemicals and may improperly or accidentally release them into the environment. Chemicals can include but are not limited to heavy metals, solvents, and flammable materials. Non-permitted discharges of these chemicals are documented by the San Francisco Bay RWQCB in the Spills SLIC list. Within the project vicinity, and upgradient of the project site, there are two known SLIC site identified and undergoing clean up and monitoring with the oversight of the DTSC.

Other Classifications for Contaminated Sites

Other sites with contaminated soil and/or groundwater within the project vicinity include those included in the Formerly Used Defense Sites database; Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) database; sites under DTSC oversight; as well as sites listed for voluntary cleanup.

Hazardous Building Materials Associated with Demolition

Although there are no buildings on the project site, project construction would include the demolition and disposal of asphalt, existing light poles, and other materials currently existing on the project site. Hazardous building materials, such as lead-based paint, asbestos, and polychlorinated biphenyls (PCBs), may be present on the site and, if disturbed, would present a potential hazard to workers or the public.

Prior to the U.S. Environmental Protection Agency (USEPA) ban in 1978, lead-based paint was commonly used on interior and exterior surfaces of buildings. Through such disturbances as sanding and scraping activities, renovation work, or gradual wear and tear, old peeling paint, or paint dust particulates have been found to contaminate surface soils or cause lead dust to migrate and affect indoor air quality. Exposure to residual lead can cause severe adverse health effects especially in children.

Asbestos is a naturally-occurring fibrous material that was extensively used as a fireproofing and insulating agent in building construction materials before such uses were banned by the USEPA in the 1970s. Asbestos was commonly used for insulation of heating ducts as well as ceiling and floor tiles to name a few typical types of materials. Similar to lead-based paint, contained within the building materials asbestos fibers present no significant health risk, but once these tiny fibers are disturbed they become airborne and create potential exposure pathways. The fibers are very small and cannot be seen with the naked eye. Once they are inhaled they can become lodged into the lung potentially causing lung disease or other pulmonary complications.

PCBs are organic oils that were formerly used primarily as insulators in many types of electrical equipment including transformers and capacitors. After PCBs were determined to be a carcinogen in the mid to late 1970s, the USEPA banned PCB use in most new equipment and began a program to phase out certain existing PCB-containing equipment. Fluorescent lighting ballasts manufactured after January 1, 1978, do not contain PCBs and are required to have a label clearly stating that

PCBs are not present in the unit. Additional information about these materials is provided in the Regulatory Framework Section below.

Radon

Radon is a naturally-occurring odorless, tasteless, and invisible gas produced from the decay of uranium in soil and water (USEPA, 2013). Structures placed on native soils with elevated levels of radon can be impacted by the intrusion of radon gas into breathing spaces of the overlying structures, which can cause lung cancer. Alameda County is listed as a Zone 2 county with a predicted average indoor radon screening level between 2 and 4 picocuries per liter. This is considered a moderate level by the USEPA. The USEPA recommends remedial action for areas with levels above 4 picocuries per liter. Based on the USEPA information, the project site is not considered to have radon above the recommended health risk level.

Schools and Daycare Facilities

There are no schools adjacent to the project site. There are three grade schools located within one mile of the project site: Westlake Middle School, St. Paul's Episcopal School, and Oakland Emiliano Zapata Street Academy. Westlake Middle School is located at 2629 Harrison Street, 0.6 mile southeast of the project site. The St. Paul's Episcopal School is located at 262 Grand Avenue, approximately one mile southeast of the project site. Oakland Emiliano Zapata Street Academy is located at 417 29th Street, approximately 0.20 mile southwest of the project site.

There is one registered preschool and one university located within the project vicinity. The Snow White Pre-School is located at 241 West MacArthur Boulevard approximately 0.6 mile northeast of the project site. Samuel Merritt University is located at 3100 Telegraph Avenue, approximately 0.40 mile west of the project site.

Airports

Aviation safety hazards can result if projects are sited in the vicinity of airports. The nearest public airport to the project site is Oakland International Airport, located approximately seven miles south of the project site. There are no private airstrips in the vicinity.

Wildland Fires

The California Department of Forestry and Fire Protection (CAL FIRE) is required by law to map areas of significant fire hazard based on fuels, terrain, weather, and other relevant factors (PRC 4201-4204 and Govt. Code 51175-89). Factors that increase an area's susceptibility to fire hazards include slope, vegetation type and condition, and atmospheric conditions. The CAL FIRE Alameda County Fire Hazard Severity Zone Map does not identify any very high or high fire hazard zones in the project vicinity (CAL FIRE, 2007).

4.7.2 Regulatory Framework

The Project is subject to government health and safety regulations applicable to the transportation, use, and disposal of hazardous materials. This section provides an overview of the health and safety regulatory framework that is applicable to the Project.

Federal

Hazardous Materials Management

The primary federal agencies with responsibility for hazardous materials management include the USEPA, U.S. Department of Labor Occupational Safety and Health Administration (OSHA), and the U.S. Department of Transportation (DOT). Federal laws, regulations, and responsible agencies are summarized in **Table 4.7-2** and are discussed in detail in this section.

State and local agencies often have either parallel or more stringent regulations than federal agencies. In most cases, state law mirrors or overlaps federal law and enforcement of these laws is the responsibility of the state or of a local agency to which enforcement powers are delegated. For these reasons, the requirements of the law and its enforcement are discussed under either the state or local agency section.

State

In January 1996, Cal EPA adopted regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program). The plan is implemented at the local level. The Certified Unified Program Agency (CUPA) is the local agency that is responsible for the implementation of the Unified Program.

In Oakland, the Alameda County Department of Environmental Health (ACDEH) and the Oakland Fire Department are the designated CUPA for all businesses.

Hazardous Materials Management

The California Hazardous Materials Release Response Plans and Inventory Law of 1985 (Business Plan Act) requires that any business that handles hazardous materials prepare a business plan, which must include the following:

- Details, including floor plans, of the facility and business conducted at the site;
- An inventory of hazardous materials that are handled or stored on site;
- An emergency response plan; and
- A safety and emergency response training program for new employees with annual refresher courses

TABLE 4.7-2
FEDERAL LAWS AND REGULATIONS RELATED TO HAZARDOUS MATERIALS MANAGEMENT

Classification	Law or Responsible Federal Agency	Description
Hazardous Materials Incidents	National Priorities List (NPL)	Compilation of over 1,200 sites for priority cleanup under the Federal Superfund Program.
	Proposed National Priorities List (PNPL)	Sites considered for NPL listing.
	Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)	Contains data on potentially hazardous waste sites that have been reported to the USEPA by California. CERCLIS contains sites which are either proposed to or on the NPL and sites which are in the screening and assessment phase for possible inclusion on the NPL.
	CERCLIS No Further Remedial Action Planned (CERC-NFRAP)	CERC-NFRAP are archived sites which indicate an assessment of the site has been completed and that the EPA has determined no further steps will be taken to list the site on NPL.
	California Hazardous Materials Incident Report System (CHMIRS)	Spills and other incidents gathered from the California Office of Emergency Services.
	Formerly Used Defense Sites Properties	Includes locations of Formerly Used Defense Sites properties where the U.S. Army Corps of Engineers is actively working or will take necessary cleanup actions.
	Proposition 65 Records (Notify 65)	This database, maintained by SWRCB, contains facility notifications about any release that could impact drinking water and thereby expose the public to a potential health risk.
Hazardous Materials Management	Community Right-to-Know Act of 1986 (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA)	Imposes requirements to ensure that hazardous materials are properly handled, used, stored, and disposed of and to prevent or mitigate injury to human health or the environment in the event that such materials are accidentally released.
Hazardous Waste Handling	Resource Conservation and Recovery Act of 1976 (RCRA)	Under RCRA, the EPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste from “cradle to grave.”
	Hazardous and Solid Waste Act	Amended RCRA in 1984, affirming and extending the “cradle to grave” system of regulating hazardous wastes. The amendments specifically prohibit the use of certain techniques for the disposal of some hazardous wastes.
	Hazardous Wastes & Substances Sites List (Cortese)	Historical compilation of sites listed in the LUST, SWF/LF and Cal SITES databases. No longer maintained as an active database.
Hazardous Materials Transportation	U.S. Department of Transportation (DOT)	Has the regulatory responsibility for the safe transportation of hazardous materials. The DOT regulations govern all means of transportation except packages shipped by mail (49 CFR).
	U.S. Postal Service (USPS)	USPS regulations govern the transportation of hazardous materials shipped by mail.
Occupational Safety	Occupational Safety and Health Act of 1970	Fed/OSHA sets standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries (29 CFR).
Structural and Building Components (Lead-based paint, PCBs, and asbestos)	Toxic Substances Control Act (TSCA)	Regulates the use and management of PCBs in electrical equipment, and sets forth detailed safeguards to be followed during the disposal of such items.
	USEPA	The USEPA monitors and regulates hazardous materials used structural and building components and affects on human health.

Hazardous Waste Handling

The Cal EPA DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and, in the event that such materials are accidentally released, to prevent or to mitigate injury to health or the environment. Laws and regulations require hazardous materials users to store these materials appropriately and to train employees to manage them safely.

Under the federal Resource Conservation and Recovery Act of 1976 (RCRA) described in Table 4.7-2, above, individual states may implement their own hazardous waste programs in lieu of RCRA, as long as the state program is at least as stringent as federal RCRA requirements. In California, the DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe management of hazardous waste; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills.

Hazardous Materials Transportation

The State of California has adopted DOT regulations for the intrastate movement of hazardous materials. State regulations are contained in Title 26 of the California Code of Regulations (CCR). In addition, the State of California regulates the transportation of hazardous waste originating in the state and passing through the state (26 CCR). Both regulatory programs apply in California. The two state agencies that have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol (CHP) and the California Department of Transportation.

Occupational Safety

The California Occupational Safety and Health Administration (Cal/OSHA) assumes primary responsibility for developing and enforcing workplace safety regulations in California. Because California has a federally approved OSHA program, it is required to adopt regulations that are at least as stringent as those found in Title 29 of the CFR. Cal/OSHA standards are generally more stringent than federal regulations.

Cal/OSHA regulations (8 CCR) concerning the use of hazardous materials in the workplace require employee safety training, safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations, which contain training and information requirements, including procedures for identifying and labeling hazardous substances, and communicating hazard information relating to hazardous substances and their handling. The hazard communication program also requires that Materials Safety Data Sheets be available to employees, and that employee information and training programs be documented. These regulations also require preparation of emergency action plans (escape and evacuation procedures, rescue and medical duties, alarm systems, and training in emergency evacuation).

State laws, like federal laws, include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. Specific, more detailed training and monitoring is required for the use of carcinogens, ethylene oxide, lead, asbestos, and certain other chemicals listed in 29 CFR. Emergency equipment and supplies, such as fire extinguishers, safety showers, and eye washes, must also be provided and maintained in accessible places.

Cal/OSHA (8 CCR), like Fed/OSHA (29 CFR) includes extensive, detailed requirements for worker protection applicable to any activity that could disturb asbestos-containing materials, including maintenance, renovation, and demolition. These regulations are also designed to ensure that persons working near the maintenance, renovation, or demolition activity are not exposed to asbestos.

Emergency Response

California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local government and private agencies. Responding to hazardous materials incidents is one part of this plan. The plan is administered by the State Office of Emergency Services (OES), which coordinates the responses of other agencies, including Cal EPA, CHP, CDFW, the San Francisco Bay Regional Water Quality Control Board (RWQCB), and the Oakland Fire Department (OFD). The OFD provides first response capabilities, if needed, for hazardous materials emergencies within the project vicinity.

Structural and Building Components

The Project would not require demolition of structures and removal of existing aboveground tanks or USTs, is not anticipated. However, project construction would include the demolition and disposal of asphalt, existing light poles, and other materials currently existing on the project site. Should hazardous building materials, such as lead-based paint, asbestos, and PCBs, be encountered, the handling of such materials would be subject to the regulations described below.

Asbestos

State laws and regulations prohibit emissions of asbestos from asbestos-related manufacturing, demolition, or construction activities; require medical examinations and monitoring of employees engaged in activities that could disturb asbestos; specify precautions and safe work practices that must be followed to minimize the potential for release of asbestos fibers; and require notice to federal and local governmental agencies prior to beginning renovation or demolition that could disturb asbestos. Asbestos represents a human health risk when asbestos fibers become airborne (friable) and are inhaled into the lungs.

The Bay Area Air Quality Management District (BAAQMD) is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement, and is to be notified ten days in advance of any proposed demolition or abatement work. Cal/OSHA regulates asbestos removal to ensure the health and safety of workers removing asbestos containing materials and also must be notified of asbestos abatement activities.

Polychlorinated Biphenyls

As previously discussed, PCBs are organic oils that were formerly placed in many types of electrical equipment and in fluorescent lighting ballasts. PCBs are highly persistent in the environment and are toxic. In 1979, the USEPA banned the use of PCBs in most new electrical equipment and began a program to phase out certain existing PCB-containing equipment. The use and management of PCBs in electrical equipment is regulated pursuant to the Toxic Substances Control Act (40 CFR). Fluorescent lighting ballasts that contain PCBs, regardless of size and quantity, are regulated as hazardous waste and must be transported and disposed of as hazardous waste.

Lead and Lead-Based Paint

The CCR, Title 22, considers waste soil with concentrations of lead to be hazardous if it exceeds a total concentration of 1,000 ppm and a soluble[1] concentration of 5 ppm. Both the federal and California OSHAs regulate all worker exposure during construction activities that involve lead-based paint. The Interim Final Rule found in 29 CFR Part 1926.62 covers construction work where employees may be exposed to lead during such activities as demolition, removal, surface preparation for re-painting, renovation, clean up and routine maintenance. The OSHA-specified method of compliance includes respiratory protection, protective clothing, housekeeping, hygiene facilities, medical surveillance, training, etc.

Local

Soil and Groundwater Contamination

In Alameda County, remediation of contaminated sites is performed under the oversight of the ACDEH and the San Francisco Bay RWQCB. The ACDEH implements a local oversight program under contract with the SWRCB to provide regulatory oversight of the investigation and cleanup of soil and groundwater contamination from leaking petroleum USTs and aboveground storage tanks. A Phase 1 Environmental Site Assessment was conducted for the project site in 2012 (Basics Environmental, 2012). The assessment concluded that no contamination or recognized environmental conditions are suspected or known to have occurred on the project site. Based on the findings of this investigation, there are no apparent obvious present or historic recognized environmental conditions on the site that warrant further investigation or documentation at this time.

Alameda County Hazardous Waste Management Program

Assembly Bill (AB) 2948 requires counties and cities either to adopt a county Hazardous Waste Management Plan as part of their general plan, or enact an ordinance requiring that all applicable zoning subdivision, conditional use permit, and variance decisions be consistent with the county hazardous waste management plan. Once each County had its Hazardous Waste Management Program approved by the State, each city had 180 days to either: (1) adopt a City Hazardous Waste Management Plan containing specified elements consistent with the approved County Hazardous Waste Management Program, (2) incorporate the applicable portions of the approved

1 Capable of being dissolved, especially in water.

Program, by reference, into the City's General Plan, or (3) enact an ordinance which requires that all applicable zoning, subdivision, conditional use permits, and variance decisions be consistent with the specified portions of the Program. Alameda County has adopted a Hazardous Waste Management Program that addresses procedures for hazardous materials incidents.

Under the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, the ACDEH is certified by the DTSC to implement the following programs:

- Hazardous Materials Management Plan and Inventory (HMMP) and the Hazardous Materials Business Plan (HMBP);
- Risk Management Program (RMP);
- UST program;
- Spill Prevention, Control and Countermeasure (SPCC) Plan for aboveground storage tanks;
- Hazardous waste generators; and
- On-site hazardous waste treatment (tiered permit).

Local Plans and Policies

Discussion of the Project's overall consistency with the Oakland General Plan is provided in Section 4.9*, Land Use, Plans and Policies*, of this EIR. General Plan policies that are also significance criteria or contain a regulatory threshold, which the Project must meet, are addressed in this section.

City of Oakland General Plan

The Safety Element of the City of Oakland General Plan contains the following policies pertaining to hazards and hazardous materials with potential relevance to the Project:

- ***Hazardous Materials, Policy HM-1*****:** Minimize the potential risks to human and environmental health and safety associated with the past and present use, handling, storage and disposal of hazardous materials.

  Action HM-1.2: Continue to enforce provisions under the zoning ordinance regulating the location of facilities which use or store hazardous materials.

  Action HM-1.4: Continue to participate in the Alameda County Waste Management Authority and, as a participant, continue to implement policies under the county's hazardous-waste management plan to minimize the generation of hazardous wastes.

  Action HM-1.6: Through the Urban Land Redevelopment program, and along with other participating agencies, continue to assist developers in the environmental clean-up of contaminated properties.

  Action HM-1.7: Create and maintain a database with detailed site information on all brownfields and contaminated sites in the city.

- ***Hazardous Materials, Policy HM-3*:** Seek to prevent industrial and transportation accidents involving hazardous materials, and enhance the city's capacity to respond to such incidents.

  Action HM-3.1: Continue to enforce regulations limiting truck travel through certain areas of the city to designated routes, and consider establishing timebased restrictions on truck travel on certain routes to reduce the risk and potential impact of accidents during peak traffic hours.

  Action HM-3.4: Continue to rely on, and update, the city's hazardous materials area plan to respond to emergencies related to hazardous materials.

Oakland Municipal Code

To protect sensitive receptors from public health effects from a release of hazardous substances, the Oakland Municipal Code, Title 8 Section 42.105 allows the City, at its discretion, to require facilities that handle hazardous substances within 1,000 feet of a residence, school, hospital, or other sensitive receptor to prepare a Hazardous Materials Assessment Report and Remediation Plan (HMARRP).

The HMARRP must include public participation in the planning process, along with the following requirements:

- Identify hazardous materials used and stored at the property and the suitability of the site;
- Analyze off-site consequences that could occur as a result of a release of hazardous substances (including fire);
- Include a health risk assessment; and
- Identify remedial measures to reduce or eliminate onsite and offsite hazards.

City of Oakland Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

The City's SCAs relevant to hazards and hazardous materials are listed below for reference. If the Project is approved by the City, all applicable SCAs would be incorporated into the Project, adopted as conditions of approval, and required of the Project to help ensure less-than-significant impacts to hazards and hazardous materials. The SCAs are incorporated and required as part of the Project, so they are not listed as mitigation measures. SCAs applicable to potential hazards and hazardous materials impacts due to the Project include:

- **HAZ SCA 1: Hazards Best Management Practices**

  Prior to the commencement of demolition, grading, or construction. The project applicant and construction contractor shall ensure that construction of Best Management Practices (BMPs) is implemented as part of construction to minimize the potential negative effects to groundwater and soils. These shall include the following:

  a) Follow manufacturers' recommendations on use, storage, and disposal of chemical products used in construction;

  b) Avoid overtopping construction equipment fuel gas tanks;

c) During routine maintenance of construction equipment, properly contain and remove grease and oils;

d) Properly dispose of discarded containers of fuels and other chemicals.

e) Ensure that construction would not have a significant impact on the environment or pose a substantial health risk to construction workers and the occupants of the proposed development. Soil sampling and chemical analyses of samples shall be performed to determine the extent of potential contamination beneath all UST's, elevator shafts, clarifiers, and subsurface hydraulic lifts when on-site demolition, or construction activities would potentially affect a particular development or building.

f) If soil, groundwater or other environmental medium with suspected contamination is encountered unexpectedly during construction activities (e.g., identified by odor or visual staining, or if any underground storage tanks, abandoned drums or other hazardous materials or wastes are encountered), the applicant shall cease work in the vicinity of the suspect material, the area shall be secured as necessary, and the applicant shall take all appropriate measures to protect human health and the environment. Appropriate measures shall include notification of regulatory agency(ies) and implementation of the actions described in the City's Standard Conditions of Approval, as necessary, to identify the nature and extent of contamination. Work shall not resume in the area(s) affected until the measures have been implemented under the oversight of the City or regulatory agency, as appropriate.

- **HAZ SCA 2: Asbestos Removal in Structures**

  Prior to issuance of a demolition permit. If asbestos-containing materials (ACM) are found to be present in building materials to be removed, demolition and disposal, the project applicant shall submit specifications signed by a certified asbestos consultant for the removal, encapsulation, or enclosure of the identified ACM in accordance with all applicable laws and regulations, including but not necessarily limited to: California Code of Regulations, Title 8; Business and Professions Code; Division 3; California Health & Safety Code 25915-25919.7; and Bay Area Air Quality Management District, Regulation 11, Rule 2, as may be amended.

- **HAZ SCA 3: Site Review by the Fire Services Division**

  Prior to the issuance of demolition, grading or building permit. The project applicant shall submit plans for site review and approval to the Fire Prevention Bureau Hazardous Materials Unit. Property owner may be required to obtain or perform a Phase II hazard assessment.

- **HAZ SCA 4: Phase I and/or Phase II Reports**

  Prior to issuance of a demolition, grading, or building permit. Prior to issuance of demolition, grading, or building permits the project applicant shall submit to the Fire Prevention Bureau, Hazardous Materials Unit, a Phase I environmental site assessment report, and a Phase II report if warranted by the Phase I report for the project site. The reports shall make recommendations for remedial action, if appropriate, and should be signed by a Registered Environmental Assessor, Professional Geologist, or Professional Engineer.

- **HAZ SCA 5: Lead-based Paint/Coatings, Asbestos, or PCB Occurrence Assessment**

  Prior to issuance of any demolition, grading or building permit. The project applicant shall submit a comprehensive assessment report to the Fire Prevention Bureau, Hazardous Materials Unit, signed by a qualified environmental professional, documenting the presence or lack thereof of asbestos-containing materials (ACM), lead-based paint, and any other building materials or stored materials classified as hazardous waste by State or federal law.

- **HAZ SCA 6: Environmental Site Assessment Reports Remediation**

  Prior to issuance of any demolition, grading or building permit. If the environmental site assessment reports recommend remedial action, the project applicant shall:

  a) Consult with the appropriate local, State, and federal environmental regulatory agencies to ensure sufficient minimization of risk to human health and environmental resources, both during and after construction, posed by soil contamination, groundwater contamination, or other surface hazards including, but not limited to, underground storage tanks, fuel distribution lines, waste pits and sumps.

  b) Obtain and submit written evidence of approval for any remedial action if required by a local, State, or federal environmental regulatory agency.

  c) Submit a copy of all applicable documentation required by local, State, and federal environmental regulatory agencies, including but not limited to: permit applications, Phase I and II environmental site assessments, human health and ecological risk assessments, remedial action plans, risk management plans, soil management plans, and groundwater management plans.

- **HAZ SCA 7: Lead-based Paint Remediation**

  Prior to issuance of any demolition, grading or building permit. If lead-based paint is present, the project applicant shall submit specifications to the Fire Prevention Bureau, Hazardous Materials Unit signed by a certified Lead Supervisor, Project Monitor, or Project Designer for the stabilization and/or removal of the identified lead paint in accordance with all applicable laws and regulations, including but not necessarily limited to: Cal/OSHA's Construction Lead Standard, 8 CCR1532.1 and DHS regulation 17 CCR Sections 35001 through 36100, as may be amended.

- **HAZ SCA 8: Other Materials Classified as Hazardous Waste**

  Prior to issuance of any demolition, grading or building permit. If other materials classified as hazardous waste by State or federal law are present, the project applicant shall submit written confirmation to Fire Prevention Bureau, Hazardous Materials Unit that all State and federal laws and regulations shall be followed when profiling, handling, treating, transporting and/or disposing of such materials.

- **HAZ SCA 9: Health and Safety Plan per Assessment**

  Prior to issuance of any demolition, grading or building permit. If the required lead-based paint/coatings, asbestos, or PCB assessment finds presence of such materials, the project applicant shall create and implement a health and safety plan to protect workers from risks associated with hazardous materials during demolition, renovation of affected structures, and transport and disposal.

- **HAZ SCA 10: Best Management Practices for Soil and Groundwater Hazards**

  The project applicant shall implement all of the following Best Management Practices (BMPs) regarding potential soil and groundwater hazards:

  a) Soil generated by construction activities shall be stockpiled onsite in a secure and safe manner. All contaminated soils determined to be hazardous or non-hazardous waste must be adequately profiled (sampled) prior to acceptable reuse or disposal at an appropriate off-site facility. Specific sampling and handling and transport procedures for reuse or disposal shall be in accordance with applicable local, state and federal agencies laws, in particular, the Regional Water Quality Control Board (RWQCB) and/or the Alameda County Department of Environmental Health (ACDEH) and policies of the City of Oakland.

b) Groundwater pumped from the subsurface shall be contained onsite in a secure and safe manner, prior to treatment and disposal, to ensure environmental and health issues are resolved pursuant to applicable laws and policies of the City of Oakland, the RWQCB and/or the ACDEH. Engineering controls shall be utilized, which include impermeable barriers to prohibit groundwater and vapor intrusion into the building (pursuant to the Standard Condition of Approval regarding Radon or Vapor Intrusion from Soil and Groundwater Sources);

c) Prior to issuance of any demolition, grading, or building permit, the applicant shall submit for review and approval by the City of Oakland, written verification that the appropriate federal, state or county oversight authorities, including but not limited to the RWQCB and/or the ACDEH, have granted all required clearances and confirmed that the all applicable standards, regulations and conditions for all previous contamination at the site. The applicant also shall provide evidence from the City's Fire Department, Office of Emergency Services, indicating compliance with the Standard Condition of Approval requiring a Site Review by the Fire Services Division pursuant to City Ordinance No. 12323, and compliance with the Standard Condition of Approval requiring a Phase I and/or Phase II Reports.

- **HAZ SCA 11: Radon or Vapor Intrusion from Soil or Groundwater Sources**

  Ongoing. The project applicant shall submit documentation to determine whether radon or vapor intrusion from the groundwater and soil is located on-site as part of the Phase I documents. The Phase I analysis shall be submitted to the Fire Prevention Bureau, Hazardous Materials Unit, for review and approval, along with a Phase II report if warranted by the Phase I report for the project site. The reports shall make recommendations for remedial action, if appropriate, and should be signed by a Registered Environmental Assessor, Professional Geologist, or Professional Engineer. Applicant shall implement the approved recommendations.

- **HAZ SCA 12: Hazardous Materials Business Plan**

  Prior to issuance of a business license. The project applicant shall submit a Hazardous Materials Business Plan for review and approval by Fire Prevention Bureau, Hazardous Materials Unit. Once approved this plan shall be kept on file with the City and will be updated as applicable. The purpose of the Hazardous Business Plan is to ensure that employees are adequately trained to handle the materials and provides information to the Fire Services Division should emergency response be required. The Hazardous Materials Business Plan shall include the following:

  a) The types of hazardous materials or chemicals stored and/or used on site, such as petroleum fuel products, lubricants, solvents, and cleaning fluids.

  b) The location of such hazardous materials.

  c) An emergency response plan including employee training information.

  d) A plan that describes the manner in which these materials are handled, transported and disposed.

4.7.3 Impacts and Mitigation Measures

Significance Criteria

The Project would have a significant impact on the environment if it were to:

1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

2. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

3. Create a significant hazard to the public through the storage or use of acutely hazardous materials near sensitive receptors;

4. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

5. Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;

6. Result in less than two emergency access routes for streets exceeding 600 feet in length unless otherwise determined to be acceptable by the Fire Chief, or his/her designee, in specific instances due to climatic, geographic, topographic, or other conditions;

7. Be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, and would result in a safety hazard for people residing or working in the project area;

8. Be located within the vicinity of a private airstrip, and would result in a safety hazard for people residing or working in the project area;

9. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or

10. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Approach to Analysis

Project construction would require ground disturbance and use of hazardous materials. These types of construction activities could result in impacts from hazards or the use of hazards materials. Potential impacts relative to hazards and hazardous materials are analyzed within the context of existing plans and policies, permitting requirements, local ordinances, and the City of Oakland's SCA. Impacts that would be substantially reduced or eliminated by compliance with these policies or requirements are found to be less-than-significant.

Project operation for retail uses typically use common consumer products containing hazardous chemicals such as toners, paints, lubricants, and kitchen and restroom cleaners. Retail uses can also handle hazardous materials that are stored in containers provided by manufacturer.

Based on the characteristics of the Project and the existing conditions, the Project would not result in impacts related to safety hazards associated with an airstrip or airport, interfere with an adopted emergency response or evacuation plan, or expose people and structures to wildland fires. No impact discussion is provided for these topics for the following reasons:

1. ***Interfere with Airstrip/Airport.*** The Project is located more than two miles from the nearest airstrip or airport and therefore, would not interfere with any airport use plan or otherwise create a safety hazard related to any such facility.

2. ***Wildland Fires.*** The Project is located in an urbanized area that is not adjacent to any wildland areas. Fire protection services are provided by the City of Oakland Fire Department and all proposed new construction would be constructed according to the most current fire safety code requirements. Therefore, the Project would not be susceptible to wildland fires and there is no impact.

Impacts

Hazardous Materials Use, Storage and Disposal

Impact HAZ-1: The Project would result in an increase in the routine transportation, use, and storage of hazardous chemicals, however, no significant public hazard would result (Criteria 1 and 3). (Less than Significant)

Project construction activities could employ hazards or the use of hazardous chemicals, such as fuels, oils and lubricants, paints and thinners, solvents, and other chemicals. The Project would involve handling and use of these hazardous materials and the disposal of the resulting hazardous wastes would be required to follow the applicable laws and regulations, as described in *Regulatory Framework* above. Additionally, the Project would be required to comply with project-specific hazards best management practices as required by HAZ SCA 1: *Hazards Best Management Practices*.

Hazardous materials would be stored according to manufacturer's recommendations and according to the specifications within the project-specific HMMP and HMBP. As required, the hazardous materials would be stored in locations according to compatibility and in storage enclosures (i.e., flammable material storage cabinets) or in areas or rooms specially designed, protected, and contained for such storage, in accordance with applicable regulations. Hazardous materials would be handled and used in accordance with applicable regulations by personnel that have been trained in the handling and use of the material and that have received proper hazard-communication training. Hazardous materials reporting (i.e., California Hazardous Materials Business Planning, California Proposition 65 notification, and Emergency Planning and Community-Right-to-Know Act reporting) would be completed as required.

All hazardous materials would be transported to the project site in accordance with applicable hazardous materials shipping regulations. Hazardous materials and waste would be delivered, stored, and handled in accordance with the HMMP. The HMMP would also provide details on appropriate personal protective equipment, disposal procedures, and spill response measures in the case of accidental upset conditions. Required compliance with applicable regulatory requirements would minimize hazards to workers, visitors, the public, and the environment from waste products. Additionally, implementation of HAZ SCA 1, *Hazards Best Management Practices*, would further reduce potential impacts. As a result of these requirements, impacts resulting from hazardous materials and hazardous waste transport, use and disposal would be less than significant.

Mitigation: None required.

Impact HAZ-2: The Project could result in the accidental release of hazardous materials used during construction through improper handling or storage, however, compliance with regulatory requirements will ensure no significant public hazard would result (Criterion 2). (Less than Significant)

Project construction activities would use certain hazardous materials such as fuels, oils, lubricants, solvents, and glues. However, the hazardous materials used on a construction site would be used in accordance with manufacturer recommendations. Spills of hazardous materials on construction sites are typically localized and are cleaned up in a timely manner. In most cases, the individual construction contractors are responsible for their hazardous materials and are required under their contract to properly store and dispose of these materials in compliance with state and federal laws. Additionally, the use of construction best management practices which would be required to be implemented as part of construction and required by HAZ SCA 1, *Hazards Best Management Practices,* along with HAZ SCA 5, *Lead-Based Paint/Coatings, Asbestos, or PCB Occurrence Assessment;* HAZ SCA 6, *Environmental Site Assessment Reports Remediation*; and HAZ SCA 9, *Health and Safety Plan per Assessment* would minimize the potential adverse effects related to accidental release of hazardous materials used during construction through improper handling or storage.

Given the use of best management practices as required by the construction contractor selected by the project sponsor, the threat of accidental release of hazardous materials through improper handling or storage is considered less than significant.

Mitigation: None required.

Exposure to Hazardous Materials

Impact HAZ-3: The Project could result in the exposure of hazardous materials in soil and ground water, however, compliance with regulatory requirements will ensure no significant public hazard would result (Criteria 2 and 5). (Less than Significant)

The Project would require excavation for installation of building foundations and underground utilities. A Phase 1 Environmental Site Assessment was conducted for the project site in 2012 (Basics Environmental, 2012). The assessment concluded that no contamination or recognized environmental conditions are suspected or known to have occurred on the project site. Further, the project site was noted as relatively clean with no obvious indications of conduits to the subsurface (e.g., collection drains, underground tanks), which would suggest a high potential discharge of hazardous materials to the subsurface. In addition, no compelling evidence was discovered that a hazardous substance has been released from previous or current operations onto (or into) the surface (Basics Environmental, 2012).

Known sites in the project vicinity that have a documented past release or that have contaminated subsurface soils and groundwater or a previously unknown release are discussed above in the Environmental Setting section and listed in Table 4.7-1. Consequently, construction on the project site could potentially intercept and disturb impacted soil and/or groundwater. Disturbed contaminated soils could expose construction workers and the public to contaminants causing various short-term health effects such as nausea, vomiting, headache, dizziness, or burns. These impacts would be considered potentially significant. However, compliance with construction best management practices which would be required to be implemented as part of construction and required by HAZ SCA 1, *Hazards Best Management Practices*, along with HAZ SCA 5, *Lead-Based Paint/Coatings, Asbestos, or PCB Occurrence Assessment;* HAZ SCA 6, *Environmental Site Assessment Reports Remediation*; HAZ SCA 9, *Health and Safety Plan per Assessment;* and HAZ SCA 11, *Radon or Vapor Intrusion*, would minimize the potential adverse effects to groundwater and soils.

Given the use of best management practices as required by the construction contractor selected by the project sponsor, the threat of exposure to the public or contamination to soil and groundwater from construction-related hazardous materials is considered less than significant.

Mitigation: None required.

Impact HAZ-4: The Project could result in the exposure of hazardous building materials during building demolition, however, compliance with regulatory requirements will ensure no significant public hazard would result (Criterion 2). (Less than Significant)

The Project would not require demolition of existing buildings. However, project construction would include the demolition and disposal of asphalt, existing light poles, and other materials currently existing on the project site. Should hazardous building materials, such as lead-based paint, asbestos, and PCBs, be encountered, construction workers, the public, or the environment could become exposed to these hazardous materials.

Potential exposure to these hazardous building materials would be reduced through appropriate identification, removal and disposal according to applicable regulations to less-than-significant levels. Asbestos containing materials are regulated both as a hazardous air pollutant under the Clean Air Act and as a potential worker safety hazard under the authority of Cal OSHA. Cal-OSHA also regulates worker exposure to lead-based paint. Any asbestos-containing materials would be abated in accordance with state and federal regulations prior to the start of demolition or renovation activities. Section 19827.5 of the California Health and Safety Code requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos. The BAAQMD is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement, and is to be notified 10 days in advance of any proposed demolition or abatement work.

Asbestos abatement contractors must follow state regulations contained in 8 CCR 1529 and 8 CCR 341.6 through 341.14 where there is asbestos-related work involving 100 square feet or more of asbestos-containing material. Asbestos removal contractors must be certified as such by the Contractors Licensing Board of the State of California. The owner of the property where abatement is to occur must have a hazardous waste generator number assigned by and registered with the DTSC in Sacramento. The site owner or responsible party and the transporter of the waste are required to file a hazardous waste manifest that details the transportation of the material from the site and its disposal.

Both the federal OSHA and Cal-OSHA regulate worker exposure during construction activities that disturb lead-based paint. The Interim Final Rule found in 29 CFR 1926.62 covers construction work in which employees may be exposed to lead during such activities as demolition, removal, surface preparation for repainting, renovation, cleanup, and routine maintenance. The OSHA-specified compliance includes respiratory protection, protective clothing, housekeeping, special high-efficiency filtered vacuums, hygiene facilities, medical surveillance, and training. No minimum level of lead is specified to activate the provisions of this regulation.

Compliance with these regulations and procedures, as well as HAZ SCA 7, *Lead-based Paint Remediation,* and HAZ SCA 2, *Asbestos Removal in Structures*, would ensure that any potential impacts due to lead-base paint or asbestos are less than significant.

Fluorescent lighting ballasts manufactured prior to 1978, and electrical transformers, capacitors, and generators manufactured prior to 1977, may contain PCBs. In accordance with the Toxic Substances Control Act and other federal and state regulations, the Project would be required to properly handle and dispose of electrical equipment and lighting ballasts that contain PCBs, reducing potential impacts to a less-than-significant level.

Mitigation: None required.

Hazardous Materials within a Quarter Mile of a School

Impact HAZ-5: The Project would require use of hazardous materials within 0.25 mile of a school, however, compliance with regulatory requirements will ensure that no significant public hazard would result (Criteria 3 and 4). (Less than Significant)

There is one school located within 0.25 mile of the project site, Oakland Emiliano Zapata Street Academy located at 417 29th Street, approximately 0.20 mile southwest of the project site. As discussed in the Environmental Setting section and *Impact HAZ-1* above, the Project could require the use, transport and storage of hazardous materials. In the event of an accidental release of hazardous materials in the vicinity of a school, as outlined below, these potential risks would be less than significant given incorporation of SCAs and other existing regulatory requirements.

The Project would be required to comply with City of Oakland's Ordinances and General Plan Policies require hazardous material handlers within 1,000 feet of a school or other sensitive receptor to prepare a HMARRP, which would disclose the use of hazardous materials at the site, conduct assessments of potential off-site risks (such as a Health Risk Assessment), and implement precautions to reduce identified risks. The HMARRP must identify hazardous materials used at a project site, the potential on-site and off-site risks, and measures to be implemented to reduce or eliminate these risks. The HMARRP is subject to review and approval by the City of Oakland. Additionally, those handling or storing hazardous materials would be required to prepare a HMMP and HMBP as required by Alameda County and the City's HAZ SCA 12, *Hazardous Materials Business Plan*. Completing these requirements would reduce to a less-than-significant level the potential for an unacceptable release of hazardous materials within 0.25 mile of a school.

Mitigation: None required.

Emergency Access Routes

Impact HAZ-6: The Project would not result in fewer than two emergency access routes for streets exceeding 600 feet in length and would not physically interfere with an adopted emergency response plan or emergency evacuation plan (Criteria 6 and 9). (Less than Significant)

The Project would not impede an emergency access route and would continue to maintain the existing city grid system. Additionally, the Project would not result in permanent road closures, and therefore, would not physically interfere with emergency response or evacuation plans. Although not anticipated, should project construction activities result in temporary road closures, these activities would be required to include traffic control plans to ensure at least two emergency access routes are available for streets exceeding 600 feet in length. Compliance with all applicable requirements would reduce potential impacts to a less-than-significant level.

Mitigation: None required.

Cumulative Impacts

Impact HAZ-7: The Project, when combined with other past, present, existing, approved, pending and reasonably foreseeable development in the vicinity, would not result in significant cumulative hazards. (Less than Significant)

Geographic Context

The cumulative geographic context for hazardous materials for the Project consists of the project site, other sites in the immediately vicinity of the project site, including area roadways used to transport hazardous materials.

Impacts

Cumulative health and safety effects could occur if activities on the project site and other existing and proposed development, together, could increase risks in the project vicinity. Cumulative health and safety impacts could occur if outdoor or off-site hazards related to the Project were to interact or combine with those of other cumulative development within and around the project vicinity (as described in Chapter 4, Section 4.07, Cumulative Development, of this Draft EIR). These impacts could occur through limited mechanisms: air emissions, transport of hazardous materials and waste to or from a project site, inadvertent release of hazardous materials to the sewer or non-hazardous waste landfill, and potential accidents that require hazardous materials emergency response capabilities. Most existing development, all present projects and all future projects have been and will be required to comply with the comprehensive regulatory requirements described in this section. Consequently, no significant cumulative impacts would occur.

Because other development projects in the project vicinity could involve the same roads, the Project could contribute to cumulative increases in the amount of hazardous material transported to and from the project site. Cumulative increases in the transportation of hazardous materials and wastes would cause a less-than-significant impact because the probability of such accidents is relatively low due to the stringent policies regulated the transport, use and storage of hazardous materials. The Project would be required to comply with the City's HAZ SCA 8, *Other Materials Classified as Hazardous Waste,* and HAZ SCA 12, *Hazardous Materials Business Plan,* which outlines the guidance for transporting hazardous materials safely to and from the project sites, in addition to HAZ SCA 3, *Site Review by Fire Services Division*, to ensure overall compliance of projects for hazardous materials.

The Project would contribute to cumulative increases in the demand for hazardous materials emergency response capabilities in Oakland. Any growth involving increased hazardous materials use has the potential to increase the demand for emergency response capabilities in the area. However, first response capabilities and hazardous materials emergency response capabilities are currently available and sufficient for all cumulative projects. Furthermore, substantive hazardous materials accidents within the project vicinity are expected to be rare, and when such incidents would occur, only one such incident would be expected at any one time (except during major catastrophes, such as major earthquakes). Furthermore, additional hazardous materials response services could be available through other jurisdictions, and private hazardous materials emergency response agencies could be used. Therefore, this cumulative impact would be less than significant.

Mitigation: None required.

4.7.4 References

Basics Environmental, 2012. *Phase 1 Environmental Site Assessment 3001-3033 Broadway, Oakland, CA*, September 20, 2012.

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California State Regional Water Quality Control Board (SWRCB), available online at http://www.geotracker.swrcb.gov, accessed May 28, 2013.

City of Oakland, City of Oakland General Plan Safety Element, adopted November 2004.

City of Oakland Public Works, Oakland Urban Land Redevelopment Program Guidance Document, January 2000.

Department of Toxic Substances Control (DTSC), Envirostor Database, available online at http://www.envirostor.dtsc.ca.gov/public/, accessed May 28, 2013.

U.S. Environmental Protection Agency (USEPA), radon website accessed at www.epa.gov/radon/healthrisks.html on January 13, 2013.

4.8 Hydrology and Water Quality

This section discusses the hydrology and water quality associated with project site and analyzes how development of the Project may affect those resources. This section describes the environmental and regulatory setting relevant to hydrology and water quality in the project vicinity. Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary.

4.8.1 Environmental Setting

Regional Drainage Patterns

The project site is located within the San Francisco Bay Hydrologic Region (DWR, 2003). San Francisco Bay provides a topographic separation between the northern and southern coastal mountain ranges. The San Francisco Bay estuarine system receives fresh water from numerous drainages, including the waters of the Sacramento and San Joaquin Rivers, which then drain into the Pacific Ocean at the Golden Gate. Flow in the East Bay area generally flows from east to west, originating in the undeveloped foothills as natural streams, passing through developed urban areas via improved channels, and discharging into sloughs that eventually flow into San Francisco Bay.

Local Drainage Patterns

The project site is within the Glen Echo Creek Watershed of the east bay region (Oakland Museum, 2012). All portions of the project site drain toward the creek or to Lake Merritt. The project site is relatively flat and drainage patterns vary with local topography. The project site is currently paved and surface runoff is captured by City of Oakland drainage systems. Glen Echo Creek has alternating daylighted and culverted sections along its 1.25-mile length from its origin above the Mountain View Cemetery at the northern terminus of Piedmont Avenue, southwest to its outlet in Lake Merritt. Within the project vicinity, the surface topography generally slopes from northwest to southeast. The daylighted sections of Glen Echo Creek begin north of I-580 and extend south parallel to Richmond Boulevard to 30th Street. Between 29th Street and Adams Park the creek is carried in a below grade culvert that runs along the base of the hill and then under the 27th and Harrison Street rights-of-way. The creek daylights again with a short section in Adams Park before flowing under Grand Avenue and into Lake Merritt and eventually into the Bay (BKF, 2012; WRT, 2009).

Surface Water

The major surface water body in the project vicinity is Glen Echo Creek. Additionally, Lake Merritt, San Antonio Creek, the Oakland Estuary, and San Francisco Bay are in the vicinity. A number of other creeks flow into Lake Merritt, which subsequently drains into the Lake Merritt Channel (San Antonio Slough), Oakland Estuary, and San Francisco Bay. Lake Merritt is a 140-acre tidal estuary that was formed thousands of years ago and has been extensively modified in the past 150 years (Lake Merritt Institute, 2013). The depth of Lake Merritt ranges from approximately eight to 10 feet. The lake is flushed twice daily by tides and receives freshwater from 60 storm drains. Therefore, the lake has a mixture of freshwater and saltwater.

Water Quality

The project site lies in a predominantly urbanized area adjacent to San Francisco Bay. The Glen Echo Creek watershed is an urbanized area containing both residential and commercial development. Available data regarding the water quality of the Glen Echo watershed system was contained within a sediment study of Glen Echo Creek conducted by the Alameda County Clean Water Program (ACCWP) in 2002. The water quality report prepared for this study presented results of water quality sampling conducted in 2000 and 2001 in Glen Echo Creek to generate baseline information on particulate-associated contaminants (ACCWP, 2002). The 2002 ACCWP water quality study identified concentrations of polychlorinated biphenyls (PCBs) and mercury from two sampling sites within a daylighted section of the mainstem Glen Echo Creek (north and east of Piedmont Avenue). The detected PCB and mercury levels are relatively low but are above the background levels typically expected for such an urban stream system. The study concluded that the PCB and mercury concentrations are attributable to a source within the sampled daylighted section of Glen Echo Creek approximately 400 feet east of the Project site.

Lake Merritt is classified as a 303(d)-listed impaired water body and Wildlife Refuge due to organic enrichment/low dissolved oxygen (listed in 2002) and high levels of trash (listed in 1998) (RWQCB, 2010). The trash primarily enters the lake through urban runoff and storm sewers. In 2006, the Coastal Commission identified bacteria as another pollutant of concern (Coastal Commission, 2006). More details about the 303(d) classification are in the *Regulatory Framework* section below.

Stormwater Runoff and Drainage Facilities

Stormwater runoff in Oakland is generally collected from the Oakland-Berkeley Hills to the northeast through the developed flatlands where it then flows primarily through underground storm drains and culverts to the San Francisco Bay via the Oakland Estuary (directly or by way of Lake Merritt) or through the City of Emeryville. The Alameda County Flood Control and Water Conservation District (ACFCWCD) constructs, operates, and maintains major trunk lines and flood-control facilities in Oakland, and the Oakland Public Works Agency (PWA) is responsible for construction and maintenance of the local storm drainage system within Oakland's public areas and roads. Stormwater runoff is conveyed in the project vicinity through onsite pavement gutters, surface drains, parking lots, and roof drains that discharge to local surface waters, as discussed above.

Flooding

Flooding is inundation of normally dry land as a result of rapid accumulation of stormwater runoff or rise in the level of surface waters. Flooding becomes a hazard when the flow of water exposes people or structures to a significant risk of loss, injury, or death. Flooding generally occurs due to excess runoff due to heavy snowmelt or rainfall, but it can also result from the interaction with natural hazards, such as tsunamis, seiches, or failure of dams.

The Federal Emergency Management Agency (FEMA), through its Flood Insurance Rate Map program, designates areas where flooding could occur during a one percent annual chance (100-year) or a 0.2 percent annual chance (500-year) flood events. The project site is located in an area designated with minimal flooding potential (FEMA, 2009).

Tsunamis are waves caused by an underwater earthquake, landslide, or volcanic eruption. Seiches are waves in a semi-enclosed or enclosed body of water such as a lake, reservoir, or harbor. The project site is outside of the Tsunami Inundation Area identified by the Association of Bay Area Governments (ABAG) website (ABAG, 2012a). The occurrence of devastating seiches in Oakland is unlikely because Lake Merritt is too shallow to generate a seiche of sufficient size to cause significant damage (City of Oakland, 2004).

Flooding could also occur due to dam failure. The California Department of Water Resources, Division of Safety of Dams (DSOD) oversees the construction of dams that are over 25 feet high and impound over 15 acre-feet of water, or those that are over six feet high and impound over 50 acre-feet of water. Due to DSOD regulatory oversight, monitoring, and design review, the potential for the catastrophic failure of a properly designed and constructed dam is minimal, whether caused by a seismic event, flood event, unstable slope conditions, or damage from corrosive or expansive soils. The DSOD requires dam owners to develop maps designating potential dam failure. ABAG compiled these maps into a central database for many bay area cities, including Oakland. Based on these maps, the Piedmont and Estates Dam inundation areas are adjacent to the project site boundary along Broadway but do not overlie the project site (ABAG, 2012a).

Sea Level Rise

Global climate change refers to changes in the Earth’s weather including temperature, precipitation, and wind patterns. The world’s leading climate scientists have reached consensus that global climate change is underway and hotter temperatures and rises in sea level would continue for centuries, no matter how much humans control future emissions. Future potential sea level rise associated with climate change may pose risks of inundation to existing and proposed development located in low-lying areas close to San Francisco Bay, including the Oakland Shoreline. The rate of potential future sea level rise is difficult to project, and estimates vary substantially among the thousands of scientific research documents available on climate change and sea level rise.

The range of estimates for future potential sea level rise in the most widely accepted literature are cited by both BCDC in its *Living with Rising Seas* report and the State of California in its *2009 Draft Climate Adaptation Strategy*. Both reports recommend using the upper end of the range as guidance to local and State agencies planning for sea level rise, and are consistent with recent predictions made by the Pacific Institute. Further, the State of California Sea Level Rise Interim Guidance Document developed by the Sea-Level Rise Task Force of the Coastal and

Ocean Working Group of the California Climate Action Team, recommends the consideration of the following sea level rise scenarios for planning purposes in the San Francisco Bay Area region and California as a whole:

- Year 2050 scenario – 16-inch rise (equivalent to 1.3 feet or 0.4 meters)
- Year 2100 scenario – 55-inch rise (equivalent to 4.6 feet or 1.4 meters)

These scenarios are consistent with the upper end of the range, have been adopted as policy by the California State Coastal Conservancy, and are used by the San Francisco Bay Conservation and Development District (BCDC) and other regional and state agencies for planning purposes.

The ABAG website shows the maximum potential sea level rise of 55 inches would be projected to affect area around Lake Merritt but would not affect the project site (ABAG, 2012b).

Groundwater

A groundwater basin is a hydrogeologic unit containing several connected and interrelated aquifers or one large aquifer (RWQCB, 2011). The project site lies in the East Bay Plain groundwater basin (Basin No. 2-9.01) that extends from Richmond to Hayward (DWR, 2003). The basin is a northwest-trending alluvial plain bounded on the west by San Francisco Bay, on the north by San Pablo Bay, on the east by Franciscan basement rock, and on the south by the Niles Cone Groundwater Basin. The alluvial materials that extend westward from the East Bay hills to San Francisco Bay constitute the deep water-bearing strata for the groundwater basin. The basin is identified as a potential water source for agricultural, industrial, and municipal use (RWQCB, 2011). Depth to groundwater on the project site historically has ranged from approximately 15 to 24 feet below ground surface (Basic Environmental, 2012)

4.8.2 Regulatory Framework

Federal, state, and local agencies regulate activities that could affect hydrological and water quality features in the project site. This section describes the regulatory framework that would apply to the Project.

Federal

Clean Water Act (CWA)

The CWA established the basic structure for regulating discharges of pollutants into the waters of the U.S. and gave the U.S. Environmental Protection Agency (USEPA) the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA sets water quality standards for all contaminants in surface waters. The statute employs a variety of regulatory and nonregulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. The U.S. Army Corps of Engineers (USACE) has jurisdiction over all waters of the U.S. including, but not limited to, perennial and intermittent streams, lakes, and ponds, as well as wetlands in marshes, wet meadows, and side hill seeps. Under Section 401 of the CWA, every applicant for a federal permit or license for any activity that may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with state water quality standards.

The National Pollutant Discharge Elimination System (NPDES) permit program under the CWA controls water pollution by regulating point and nonpoint sources that discharge pollutants into "waters of the U.S." California has an approved state NPDES program. The USEPA has delegated authority for NPDES permitting to the California State Water Resources Control Board (SWRCB), which has nine regional boards. The San Francisco Bay Regional Water Quality Control Board (RWQCB) regulates water quality in the project vicinity.

Section 303(d) of the CWA requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., not meeting one or more of the water quality standards established by the state). These waters are identified in the Section 303(d) list as waters that are polluted and need further attention to support their beneficial uses. Once the water body or segment is listed, the state is required to establish Total Maximum Daily Load (TMDL) for the pollutant causing the conditions of impairment. TMDL is the maximum amount of a pollutant that a water body can receive and still meet water quality standards. Generally, TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The intent of the Section 303(d) list is to identify water bodies that require future development of a TMDL to maintain water quality.

In accordance with Section 303(d), the San Francisco Bay RWQCB has identified impaired water bodies within its jurisdiction, along with the pollutant or stressor responsible for impairing the water quality (RWQCB, 2010). In the San Francisco Bay region, the RWQCB has listed Lake Merritt as an impaired water body for organic enrichment/low dissolved oxygen and trash. The RWQCB has not yet developed TMDLs for Lake Merritt.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, Division 7 of the California Water Code, requires the SWRCB to adopt water quality control plans. The purpose of the plans is to establish water quality objectives for specific water bodies. The act also authorizes the NPDES program under the CWA, which establishes water quality requirements for discharges to waters of the state. Most of the implementation of SWRCB's responsibilities is delegated to nine regional boards. The San Francisco Bay RWQCB has established the regional basin plan and the permit requirements for stormwater runoff for the project site (see *Regional Water Quality Control Board* section below).

California Toxics Rule

Under the California Toxics Rule, the USEPA has proposed water quality criteria for priority toxic pollutants for inland surface waters, enclosed bays, and estuaries. These federally promulgated criteria create water quality standards for California waters. The California Toxic Rule satisfies CWA requirements and protects public health and the environment. The USEPA and the SWRCB have the authority to enforce these standards. However, construction activities from the Project could discharge toxic pollutants directly into the inland surface waters, such as Lake Merritt, or San Francisco Bay, therefore the California Toxic Rule would apply.

Sea Level Rise

California Climate Adaption Strategy

In November 2008, Governor Arnold Schwarzenegger issued Executive Order S-13-08. The Order indicated that future potential sea level rise associated with climate change may have a substantial effect on coastal development, and initiated the assessment of relative sea level rise projections specific to California. The assessment takes into account issues such as (1) erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates; (2) the range of uncertainty in selected sea level rise projections, (3) a synthesis of existing information on projected sea level rise impacts to State infrastructure (such as roads, public facilities, and beaches), natural areas, and coastal and marine ecosystems; and (4) a discussion of future research needs regarding sea level rise for California.

Per Executive Order S-13-08, the Governor, with input from multiple state agencies, developed the 2009 California Climate Adaptation Strategy (Strategy)—a multi-sector strategy designed to help guide California’s efforts in adapting to climate change impacts (California Natural Resources Agency, 2009). The purpose of the 2009 Strategy is to identify the best known science on climate change impacts in seven specific sectors and make recommendations on how to manage those effects. The seven sectors in the report include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. The contents of the strategy were developed to address how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. A key recommendation in the Strategy is that State agencies should generally not plan, develop, or build any new significant structure in a place where that structure will require significant protection from sea level rise, storm surges, or coastal erosion during the expected life of the structure. However, the Strategy recognizes that vulnerable shoreline areas containing existing development that have regionally significant economic, cultural, or social value may have to be protected, and infill development in these areas may be accommodated. The Strategy stated that State agencies should incorporate this policy into their decisions and other levels of government are also encouraged to do so.

Draft California Climate Adaption Policy Guide

The Draft California Climate Adaptation Policy Guide (APG) was published in April of 2012 by the California Emergency Management Agency and the California Natural Resources Agency to provide a method for local and regional entities to evaluate vulnerability and devise adaption strategies to address the impacts of climate change including sea level rise and flooding (California Emergency Management Agency and the California Natural Resources Agency, 2012). The APG seeks to provide a comprehensive approach to climate adaptation. However, because the most effective adaptation policy is based on local conditions, needs, and resources, the APG is not prescriptive in its approach. Instead, it is a decision-making framework that provides guidance for communities to begin taking direct actions in response to climate impacts. The APG is divided into three parts: (1) Introduction and Framework, (2) Regional Adaption Considerations, and (3) Adaption Strategies.

The APG analyzed specific regions including the Bay Area and the following climate impact sectors: Equity, Health and Socio-Economic Impacts; Ocean and Coastal Resources; Water Management; Biodiversity and Habitat; Forest and Rangeland and Agriculture, as well as Transportation and Energy Infrastructure. The APG identified sea level rise, flooding, equity, health and socio-economic impacts, fire, and ecosystem and agriculture as areas to consider in developing for adaption strategies. The selected adaption strategies included:

- ***Strategy 3.1*****:** Develop an adaptive management plan to address the long term impacts of sea level rise.
- ***Strategy 3.3*****:** Require accounting of sea level rise in all applications for new development in shoreline areas.

Regional

Regional Water Quality Control Board

The San Francisco Bay RWQCB is responsible for the protection of beneficial uses and the water quality of water resources within the San Francisco Bay region. The San Francisco Bay RWQCB administers the NPDES stormwater permitting program and regulates stormwater in the San Francisco Bay region. The City of Oakland is a permittee under the NPDES Municipal Stormwater Permit for the Alameda Countywide Clean Water Program (see below for detailed discussion). Project applicants are required to apply for a NPDES General Permit for discharges associated with project construction activities of greater than one acre.

Construction General Permit

Stormwater discharges from construction activities on one acre or more are regulated by the RWQCB and are subject to the permitting requirements of the NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit, 99-08-DWQ). All dischargers are required to obtain coverage under the Construction General Permit Order 2009-0009-DWQ adopted on September 2, 2009. The RWQCB established the General Construction Permit program to reduce surface water impacts from construction activities. Construction associated with the Project would be required to comply with the current NPDES permit requirements to control stormwater discharges from the construction site. The General Construction Permit requires the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) for construction activities. The SWPPP must be prepared before the construction begins, and in certain cases, before demolition begins. The SWPPP must include specifications for best management practices (BMPs) that would need to be implemented during project construction. BMPs are measures that are undertaken to control degradation of surface water by preventing soil erosion or the discharge of pollutants from the construction area. The SWPPP must describe measures to prevent or control runoff after construction is complete and identify procedures for inspecting and maintaining facilities or other project elements. Required elements of a SWPPP include:

1. Site description addressing the elements and characteristics specific to the site
2. Descriptions of BMPs for erosion and sediment controls;
3. BMPs for construction waste handling and disposal;
4. Implementation of approved local plans;
5. Proposed post-construction controls; and
6. Non-stormwater management.

Examples of typical construction BMPs include scheduling or limiting activities to certain times of year, installing sediment barriers such as silt fence and fiber rolls, maintaining equipment and vehicles used for construction, tracking controls such as stabilizing entrances to the construction site, and developing and implementing a spill prevention and cleanup plan. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, vehicle and equipment washing and fueling. The California Stormwater Quality Association (CASQA) established BMPs for the State of California in the *California Storm Water Best Management Practice Handbook* in 2003. The CASQA BMPs are now only available through a paid subscription website.

Regional Water Quality Control Plan

The San Francisco Bay RWQCB prepared the *San Francisco Bay Basin Water Quality Control Plan* (Basin Plan) for San Francisco Bay (RWQCB, 2011). The Basin Plan contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the region and describes beneficial uses of major surface waters and their tributaries. The Basin Plan lists the following beneficial uses for the South Basin of San Francisco Bay:

- Ocean, Commercial, and Sport Fishing
- Estuarine Habitat
- Industrial Service Supply
- Fish Migration
- Navigation
- Preservation of Rare and Endangered Species
- Water Contact Recreation
- Noncontact Recreation
- Shellfish Harvesting
- Wildlife Habitat

The Basin Plan identifies the following beneficial uses for Lake Merritt:

- Water Contact Recreation
- Noncontact Recreation
- Fish Spawning
- Wildlife Habitat

For the Project, the RWQCB is responsible for regulating construction activities to ensure the protection of the above beneficial uses.

San Francisco Bay Conservation and Development Commission Permit Program

The BCDC is a state agency created in 1965 to regulate development in the Bay and along its shoreline for the purpose of limiting and controlling the amount of fill placed in the Bay. It is necessary to obtain a BCDC permit prior to undertaking most work in the Bay or within 100 feet of the shoreline, including filling, dredging, shoreline development and other work. The site is not located within 100 feet of the shoreline or within BCDC's the Adapting to Rising Tides subregion.

Alameda County Regulations

The ACFCWCD and the City of Oakland PWA share responsibility for maintaining drainage facilities in Oakland. The project site lies within the jurisdiction of Zone 12 of the ACFCWCD (ACFCWCD, 2010). The Project would be required to comply with the requirements of these agencies

Alameda Countywide Clean Water Program

The ACCWP includes 17 member agencies that work together to protect creeks, wetlands, and San Francisco Bay. The City of Oakland and ACFCWCD are two of the agencies that participate in the ACCWP. The member agencies have developed performance standards to clarify the requirements of the stormwater pollution prevention program, adopted stormwater management ordinances, conducted extensive education and training programs, and reduced stormwater pollutants from industrial areas and construction sites. In the project vicinity, the ACCWP administers the stormwater program to meet CWA requirements by controlling pollution in the local storm drain sewer systems.

The ACCWP is part of the Municipal Regional Stormwater NPDES Permit (MRP) that was adopted by the RWQCB on October 14, 2009. The new NPDES permit (Order R2-2009-0074 Permit No. CAS612008) issued by the RWQCB is designed to enable the ACCWP agencies to meet CWA requirements. The permit addresses the following major program areas: regulatory compliance, focused watershed management, public information/participation, municipal maintenance activities, new development and construction controls, illicit discharge controls, industrial and commercial discharge controls, monitoring and special studies, control of specific pollutants of concern, and performance standards. The permit also includes performance standards for new development and construction activities also referred to as Provision C.3 requirements. The C.3 requirements include measures for Permittees to use in planning appropriate source controls in site designs to include stormwater treatment measures in development projects to address both soluble and insoluble stormwater runoff pollutant discharges. An additional goal is to prevent increases in runoff flows primarily accomplished through implementation of low impact development techniques.

"Redevelopment" is defined as a project on a previously developed site that results in the addition or replacement of impervious surface. According to the C.3 provision in the ACCWP NPDES permit, the potential actions under the Specific Plan fall in the "significant redevelopment projects" category under Group 1 Projects. A significant redevelopment project is defined as a project on a previously developed site that results in addition or replacement of total of 43,560 square feet (one acre) or more of impervious surface. The permit requires that in the case of a significant redevelopment project that would result in an increase of, or replacement of, more than 50 percent of the impervious surface of a previously existing development, and the existing development was not subject to stormwater treatment measures, the entire project be included in the treatment measure design.

The C.3 provision also requires preparation of a hydrograph modification management plan in cases where the changes in the amount and timing of runoff would increase stormwater discharge rates and/or duration and increase the potential for erosion or other significant adverse impacts to beneficial uses. The actions under the Project shall comply with the provisions of the ACCWP NPDES Permit.

Oakland has jurisdiction over and/or maintenance responsibility for its municipal separate storm drain systems and/or watercourses in the City. Construction activities associated with development of the Project would be subject to the NPDES permit requirements for stormwater management and discharges.

Local

City of Oakland General Plan

The following objectives, policies, and actions from City of Oakland's General Plan are applicable to the Project:

- ***Open Space, Conservation and recreation (OSCAR), Chapter 3-Conservation, Water Resources, Objective CO-5: Water Quality*****:** To minimize the adverse effects of urbanization on Oakland's groundwater, creeks, lakes, and nearshore waters.

- ***Safety Element, Chapter 6-Geologic Hazards, Policy GE-2:*** Continue to enforce ordinances and implement programs that seek specifically to reduce the landslide and erosion hazards.

    Action GE-2.2: Continue to enforce the grading, erosion and sedimentation ordinance by requiring, under certain conditions, grading permits and plans to control erosion and sedimentation.

    Action GE-2.3: Continue to enforce provisions under the creek protection, stormwater management and discharge control ordinance designed to control erosion and sedimentation.

    Action GE-2.5: Enact regulations requiring new development projects to employ site-design and source-control techniques to manage peak stormwater runoff flows and impacts from increased runoff volumes.

- ***Safety Element, Chapter 6-Flooding Hazards, Policy FL-1*:** Enforce and update local ordinance, and comply with regional orders that would reduce the risk of storm-induced flooding.

  Action FL-1.1: Amend, as necessary, the city's regulations concerning new construction and major improvements to existing structures within flood zones in order to maintain compliance with federal requirements and, thus, remain a participant in the National Federal Insurance Program.

  Action FL-1.3: Comply with all applicable performance standards pursuant to the 2003 Alameda countywide National Pollutant Discharge Elimination System municipal stormwater permit that seek to manage increases in stormwater runoff flows from new-development and redevelopment construction projects.

  Action FL-1.4: Continue to enforce the grading, erosion, and sedimentation ordinance by prohibiting the discharge of concentrated stormwater flows by other than approved methods.

- ***Safety Element, Chapter 6-Flooding Hazards, Policy FL-2*:** Continue or strengthen city programs that seek to minimize the storm-induced flooding hazard.

  Action FL-2.1: Continue to repair and make structural improvements to storm drains to enable them to perform to their design capacity in handling water flows.

- ***Safety Element, Chapter 6-Flooding Hazards, Policy FL-4*:** Minimize further the relatively low risks from non-storm-related forms of flooding.

  Action FL-4.1: Request from the state Division of Safety of Dams a timeline for the maintenance inspection of all operating dams in the city.

  Action FL-4.2: Review for adequacy, and update if necessary, procedures adopted by the city pursuant to the Dam Safety Act for the emergency evacuation of areas located below major water-storage facilities.

  Action FL-4.3: Inform shoreline-property owners of the possible long-term economic threat posed by rising sea levels.

  Action FL-4.4: Stay informed of emerging scientific information on the subject of rising sea levels, especially on actions that local jurisdictions can take to prevent or mitigate this hazard.

Oakland's Energy and Climate Action Plan

The City of Oakland has developed an Oakland Energy and Climate Action Plan (ECAP) to identify, evaluate and recommend prioritized actions to reduce energy consumption and GHG emissions in Oakland. The ECAP identifies energy and climate goals, clarifies policy direction, and identifies priority actions for reducing energy use and greenhouse gas (GHG) emissions. On July 7, 2009, the Oakland City Council directed staff to develop the draft Oakland ECAP using a GHG reduction target equivalent to 36 percent below 2005 GHG emissions by 2020. The City adopted the ECAP on December 4, 2012.

In addition to GHG emissions, the ECAP recognizes that climate change will likely include sea level rise and flooding impacts. Furthermore the ECAP notes that climate change vulnerability is a function of exposure to climate impacts, sensitivity to those impacts and the capacity to adapt and recover. The ECAP includes several adaption and resilience strategies including the following:

- ***Climate Action Plan AD-1*:** The City shall continue to participate in local and regional efforts to assess potential sea level rise impacts and shall consider implementing appropriate future recommended adaptation strategies as they are developed.
- ***Climate Action Plan AD-2*:** Conduct a study of all local climate impacts in collaboration with local partners including the BCDC, the Pacific Institute and UC Berkeley.
- ***Climate Action Plan AD-6*:** Encourage and participate actively in efforts of regional partners including BCDC to engage in the development of a regional climate adaption strategy informed by climate impact modeling, scenario analysis and development of adaption strategies to advance regional climate adaption capacity and resilience. Collaborate with local partners to ensure that the actions of neighboring jurisdictions or other agencies do not indirectly exacerbate impacts to Oakland neighborhoods.

City of Oakland Municipal Code

The City of Oakland implements the following regulations to protect water quality and water resources:

- ***Grading Ordinance* (*Chapter 15.04.660*).** The Grading Ordinance requires a permit for grading activities on private or public property for projects that exceed certain criteria, such as amount of proposed excavation and degree of site slope. During project construction, the volume of the excavated fill material could exceed 50 cubic yards and could result in a 20 percent slope onsite, or the depth of excavation could exceed five feet at any location. Therefore, the project sponsor would be required to apply for the grading permit and prepare a grading plan, erosion and sedimentation control plan, and drainage plan.

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

The City's SCAs relevant to hydrology and water quality are listed below for reference. If the Project is approved by the City, all applicable SCAs would be incorporated into the Project, adopted as conditions of approval, and required, as applicable, to help ensure less-than-significant impacts to hydrology and water quality. The SCAs are incorporated and required as part of the Project, so they are not listed as mitigation measures. SCAs applicable to potential geologic impacts could also affect hydrologic resources and are listed in Section 4.5, *Geology, Soils and Geohazards,* of this Draft EIR. Standard Conditions of Approval applicable to potential hydrology and water quality impacts due to development of the Project include:

- **HYD SCA 1: Stormwater Pollution Prevention Plan (SWPPP)**

  Prior to and ongoing throughout demolition, grading, and/or construction activities. The project applicant must obtain coverage under the General Construction Activity Storm Water Permit (General Construction Permit) issued by the State Water Resources Control Board (SWRCB). The project applicant must file a notice of intent (NOI) with the SWRCB. The project applicant will be required to prepare a stormwater pollution prevention plan (SWPPP) and submit the plan for review and approval by the Building Services Division. At a minimum, the SWPPP shall include a description of construction materials, practices, and equipment storage and maintenance; a list of pollutants likely to contact stormwater; site-specific erosion and sedimentation control practices; a list of provisions to eliminate or reduce discharge of materials to stormwater; Best Management Practices (BMPs), and an inspection and monitoring program. Prior to the issuance of any construction-related permits, the project applicant shall submit to the Building Services Division a copy of the SWPPP and evidence of submittal of the NOI to the SWRCB. Implementation of the SWPPP shall start with the commencement of construction and continue though the completion of the project. After construction is completed, the project applicant shall submit a notice of termination to the SWRCB.

- **HYD SCA 2: Post-construction Stormwater Management Plan**

  Prior to issuance of building permit (or other construction-related permit). The applicant shall comply with the requirements of Provision C.3 of the National Pollutant Discharge Elimination System (NPDES) permit issued to the Alameda Countywide Clean Water Program. The applicant shall submit with the application for a building permit (or other construction-related permit) a completed Construction-Permit-Phase Stormwater Supplemental Form to the Building Services Division. The project drawings submitted for the building permit (or other construction-related permit) shall contain a stormwater management plan, for review and approval by the City, to manage stormwater run-off and to limit the discharge of pollutants in stormwater after construction of the project to the maximum extent practicable.

  a) The post-construction stormwater management plan shall include and identify the following:

     1. All proposed impervious surface on the site;
     2. Anticipated directional flows of on-site stormwater runoff; and
     3. Site design measures to reduce the amount of impervious surface area and directly connected impervious surfaces; and
     4. Source control measures to limit the potential for stormwater pollution;
     5. Stormwater treatment measures to remove pollutants from stormwater runoff; and
     6. Hydromodification management measures so that post-project stormwater runoff does not exceed the flow and duration of pre-project runoff, if required under the NPDES permit.

  b) The following additional information shall be submitted with the post-construction stormwater management plan:

     1. Detailed hydraulic sizing calculations for each stormwater treatment measure proposed; and
     2. Pollutant removal information demonstrating that any proposed manufactured/mechanical (i.e., non-landscape-based) stormwater treatment measure, when not used in combination with a landscape-based treatment measure, is capable or removing the range of pollutants typically removed by landscape-based treatment measures and/or the range of pollutants expected to be generated by the project.

  All proposed stormwater treatment measures shall incorporate appropriate planting materials for stormwater treatment (for landscape-based treatment measures) and shall be designed with considerations for vector/mosquito control. Proposed planting materials for all proposed landscape-based stormwater treatment measures shall be included on the landscape and irrigation plan for the project. The applicant is not required to include on-site stormwater treatment measures in the post-construction stormwater management plan if he or she secures approval from Planning and Zoning of a proposal that demonstrates compliance with the requirements of the City's Alternative Compliance Program.

Prior to final permit inspection. The applicant shall implement the approved stormwater management plan.

- **HYD SCA 3: Maintenance Agreement for Stormwater Treatment Measures**

  a) *Prior to final zoning inspection.* For projects incorporating stormwater treatment measures, the applicant shall enter into the "Standard City of Oakland Stormwater Treatment Measures Maintenance Agreement," in accordance with Provision C.3.e of the NPDES permit, which provides, in part, for the following: The applicant accepting responsibility for the adequate installation/construction, operation, maintenance, inspection, and reporting of any on-site stormwater treatment measures being incorporated into the project until the responsibility is legally transferred to another entity; and

  b) Legal access to the on-site stormwater treatment measures for representatives of the City, the local vector control district, and staff of the Regional Water Quality Control Board, San Francisco Region, for the purpose of verifying the implementation, operation, and maintenance of the on-site stormwater treatment measures and to take corrective action if necessary. The agreement shall be recorded at the County Recorder's Office at the applicant's expense.

- **UTIL SCA 2: Stormwater and Sewer**

  This Standard Condition of Approval, which affects stormwater and sewer infrastructure, applies to the Project and is stated in full in the assessment of utilities in Section 4.13, *Utilities and Service Systems*.

4.8.3 Impacts and Mitigation Measures

Significance Criteria

The Project would have a significant impact on the environment if it were to:

1. Violate any water quality standards or waste discharge requirements;

2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or proposed uses for which permits have been granted);

3. Result in substantial erosion or siltation on- or off-site that would affect the quality of receiving waters;

4. Result in substantial flooding on- or off-site;

5. Create or contribute substantial runoff which would exceed the capacity of existing or planned stormwater drainage systems;

6. Create or contribute substantial runoff which would be an additional source of polluted runoff;

7. Otherwise substantially degrade water quality;

8. Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, that would impede or redirect flood flows;

9. Place within a 100-year flood hazard area structures which would impede or redirect flood flows;

10. Expose people or structures to a substantial risk of loss, injury or death involving flooding;

11. Expose people or structures to a substantial risk of loss, injury, or death as a result in inundation by seiche, tsunami, or mudflow;

12. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course, or increasing the rate or amount of flow, of a creek, river or stream in a manner that would result in substantial erosion, siltation, or flooding, both on- or off-site; or

13. Fundamentally conflict with the City of Oakland Creek Protection Ordinance (OMC Chapter 13.16) intended to protect hydrologic resources. [Note: Although there are no specific, numeric/quantitative criteria to assess impacts, factors to be considered in determining significance include whether there is substantial degradation of water quality through (a) discharging a substantial amount of pollutants into a creek; (b) significantly modifying the natural flow of the water or capacity; (c) depositing substantial amounts of new material into a creek or causing substantial bank erosion or instability; or (d) substantially endangering public or private property or threatening public health or safety.]

Approach to Analysis

The Project would result in construction activities that would require ground disturbance and use of hazardous materials. These types of construction activities could result in impacts to hydrology and water quality. Potential impacts to hydrology and water quality are analyzed within the context of existing plans and policies, permitting requirements, local ordinances, and the City of Oakland's Standard Conditions of Approval. Impacts that would be substantially reduced or eliminated by compliance with these policies or requirements are found to be less-than-significant. Additional discussion of potential erosion impacts is presented in Section 4.5, *Geology, Soils and Geohazards* of this Draft EIR. Detailed analysis of potential impacts due to the use of hazardous materials is presented in Section 4.7, *Hazardous Materials*, of this Draft EIR. Potential impacts to stormwater infrastructure are discussed in Section 4.13, *Utilities and Service Systems*, of this Draft EIR.

Based on the project site and its geographical location, the Project would not result in impacts related to the following criteria. No impact discussion is provided for these topics for the following reasons:

- ***100-year Flood Hazard Area:*** According to FEMA's Flood Insurance Rate Map program, the project site is not within a 100-year flood hazard area and thus would not place housing or other structures within a 100-year flood hazard area.
- ***City of Oakland Creek Protection Ordinance:*** The project site is not identified as a "creekside property" and thus is not subject to the City of Oakland Creek Protection Ordinance.

Impacts

Stormwater, Drainages and Water Quality

Impact HYD-1: The Project could alter drainage patterns and increase the volume of stormwater, or the level of contamination or siltation in stormwater flowing from the project site, however, compliance with applicable regulatory requirements will ensure that no significant impacts would result (Criteria 1, 3 through 7, and 12). (Less than Significant)

The Project would be required to comply with uniformly-applied SCAs, consistent with General Plan Policies, which include preparation of a Grading Plan, Erosion and Sedimentation Control Plan, and Drainage Plan. Compliance with the ACCWP NPDES Permit and implementation of the Construction SWPPP would require the Project to incorporate BMPs to control sedimentation, erosion, hazardous materials contamination of runoff during construction. Further, the C.3 provision of the ACCWP NPDES Permit requires that there be no net increase in stormwater runoff at a site after project construction. Thus, water quality and flooding impacts would be minimized during construction and operation of the Project.

Additionally, compliance with the City of Oakland Grading Ordinance, and the SCAs would minimize sedimentation and contamination to stormwater and surface water during construction activities. HYD SCA 1, *Stormwater Pollution Prevention Plan;* HYD SCA 2, *Post-construction Stormwater Pollution Management Plan; and* HYD SCA 3, *Maintenance Agreement for Stormwater Treatment Measures* would be applicable to the Project for protecting water quality during construction and after construction. UTIL SCA 2, *Stormwater and Sewer,* would be applicable to the Project ensuring that stormwater infrastructure has the capacity for flows produced on the project site. Therefore, the implementation of these plans, and adherence to the SCAs would reduce the potential impact to a less-than-significant level.

Mitigation: None required.

Flooding

Impact HYD-2: The Project could be susceptible to flooding hazards in the event of dam or reservoir failure (Criteria 10 and 11). (Less than Significant)

Strong ground shaking caused by an earthquake could damage a local dam or reservoir resulting in failure and downstream flooding. The East Bay Municipal Utilities District (EBMUD) has four reservoirs located north of the project site. As discussed in the setting, the eastern edge of the project site could experience flooding if up to two of these dams were to experience dam failure.

The Safety Element of the City of Oakland General Plan policy states that the City will "minimize further the relatively low risks from non-storm-related forms of flooding" by requesting from the state Division of Safety of Dams submit a timeline for the maintenance inspection of all operating dams in the City and reviewing procedures adopted by the city pursuant to the Dam Safety Act for the emergency evacuation of areas located below major water-storage facilities. DSOD requires all dam operators to comply with annual inspections and seismic standards that minimize the potential for a catastrophic failure of the dam. Continued compliance with these General Plan policies will reduce potential impacts to a less-than-significant level.

Mitigation: None required.

Sea Level Rise

Impact HYD-3: The Project would not be susceptible to inundation in the event of sea-level rise (Criterion 11). (Less than Significant)

The impact of flooding related to sea level rise pertains to the impact of an existing/future environmental condition on the project site. CEQA only requires an analysis of impacts pertaining to a project's impact on the environment. The impact of future growth in the project vicinity on the environment related to the project's GHG emissions—the cause of sea level rise—is analyzed and discussed in Section 4.6, *Greenhouse Gases and Climate Change* of this Draft EIR. Per CEQA, this Draft EIR is not required to analyze or mitigate impacts pertaining to the impact of the environment on the Project. An appellate court specifically identified the effect of sea level rise on a project as an impact of the environment on a project and, therefore, not required to be analyzed under CEQA. Although not legally required by CEQA, this Draft EIR discusses the impact of sea level rise on the Project in the interest of being conservative and providing information to the public and decision-makers.

Although outside of the area anticipated to be affected by sea level rise, the estimated amount of sea level rise is an estimate and thus subject to variations or underestimation. Given the potential for sea level rise, it is reasonable to anticipate that FEMA will continue to update its flood hazards mapping over time as necessary to reflect changes in sea levels. Thus, when implemented, the safety measures built into the General Plan policies in the Safety Element, and the SCAs related to construction within 100-year flood zones, and adaptive management measures to sea level rise would reduce these potential impacts to less-than–significant levels.

The ABAG website shows the maximum potential sea level rise of 55 inches would be projected to affect areas around Lake Merritt but would not affect the project site (ABAG, 2012b). Furthermore, implicit in the discussion of global warming, GHG emissions and sea level rise is that it extends beyond specific development projects, a specific area, or, indeed, an entire City. As both a local and a regional issue and must be addressed in that context. The adopted Bay Plan and Oakland's ECAP specifically recognize this and include actions to participate in the preparation of a regional climate adaption strategy. As stated above, the Project is not causing sea level rise, sea level rise will occur regardless of the adoption of the Project. Because sea level rise is an impact of the environment on the project, it is not legally a CEQA impact.

Mitigation: None required.

Use of Groundwater

Impact HYD-4: The Project would not adversely affect the availability of groundwater supplies or interfere substantially with groundwater recharge (Criterion 2) (Less than Significant)

The project site is underlain by the East Bay Plain groundwater basin. The San Francisco RWQCB has identified groundwater supplies in this basin for municipal, industrial and agricultural water supply. Impacts to the aquifer would occur if the Project resulted in reduced recharge to the aquifer or increased extraction from the aquifer. The amount of water able to infiltrate the aquifer through pervious areas within the project site would not substantially decrease because the project site is already paved and covered in impervious surfaces. Additionally, compliance with the C.3 provisions of the NPDES Municipal Stormwater Permit for the ACCWP would require that recharge rates at the project site is equivalent to the recharge rate at the site prior to development. Also, potable water would be supplied to the Project through imported surface water by EBMUD. Therefore, the existing and potential use of groundwater for the Project would not increase. Consequently, impacts to groundwater would be less than significant.

Mitigation: None required.

Inundation by Seiche, Tsunami, or Mudflow

Impact HYD-5: The Project would not be susceptible to mudflow, seiche, and tsunami-related hazards (Criterion 11). (Less than Significant)

The project site would not be susceptible to mudflow, which generally results from volcanic activity or catastrophic dam failure. Seiche waves would not be a risk in the project vicinity because the relatively shallow depth of water within Lake Merritt would not result in significant sieche-related impacts during a seismic event.

The project site is located in an inland area that is not susceptible to tsunamis, which generally occur in areas along the shoreline and for a small distance inland. In addition, the modeled sources of tsunamis that are most likely to affect the Bay Area include a few potential local sources but are predominantly distant events. Consequently, tsunami events in the East Bay area are very rare and there is little historical record of past events that would enable the ability to evaluate the probability of such an event occurring. Therefore, the potential impact from tsunamis is considered less than significant.

Mitigation: None required.

Cumulative Impacts

Impact HYD-6: The Project, combined with past, present, existing, approved, pending, and reasonably foreseeable future projects would not result in potentially significant cumulative impacts to hydrologic resources. (Less than Significant)

Geographic Context

The geographic context used for the cumulative assessment of water quality and hydrology impacts is the East Bay Plain of the San Francisco Bay Basin. This includes the City of Oakland and its surrounding areas.

Impacts

As discussed above, the Project would include conformance with State and local laws and regulations as well as SCAs that would reduce hydrology and water quality impacts to less-than-significant levels. Specifically, potential changes related to stormwater quality, stormwater flows, drainage, impervious surfaces, and flooding would be minimized via the implementation of stormwater control measures, stormwater retention measures, stormwater quality control measures, and project-specific environmental review that would integrate measures to reduce potential flooding impacts.

Cumulative impacts can result from individually minor but collectively significant impacts from projects taking place over a period of time. Cumulative projects could combine to cause hydrology and water quality related impacts such as potential cumulative reductions in the water quality of San Francisco Bay, or degradation of urban stormwater quality. Cumulative projects include those described in Chapter 4, Section 4.07, Cumulative Development, of this Draft EIR. All projects have been or would be subject to similar permit requirements and would be required to comply with City of Oakland ordinances and General Plan policies, as well as numerous SCAs that address the potential effects of hydrology and water quality and are discussed throughout this analysis. These regulatory requirements will ensure that cumulative impacts are substantially reduced. The potential impacts of Project discussed in this section would not be substantial, and would not substantially contribute to any cumulative impacts. Therefore, the Project impacts on hydrology and water quality are not cumulatively considerable when viewed in connection with the effects of the other past, present, and reasonably foreseeable probable future projects within the project vicinity.

Mitigation: None required.

4.8.4 References

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4.9 Land Use, Plans and Policies

This section analyzes how the Project may affect and comply with existing land uses, plans and policies. Specifically, it describes the existing land use patterns, adopted City of Oakland General Plan (General Plan) land use classifications, and zoning designations on and around the project site. This section also describes the applicable plans and policies that guide development on and around the project site and evaluates the consistency of the Project with these plans and policies and other applicable land use regulations. Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary. Pursuant to the General Plan, as well as Section 15358(b) of the CEQA Guidelines, mitigation measures are proposed only to address physical impacts that may result from development of the Project.

4.9.1 Environmental Setting

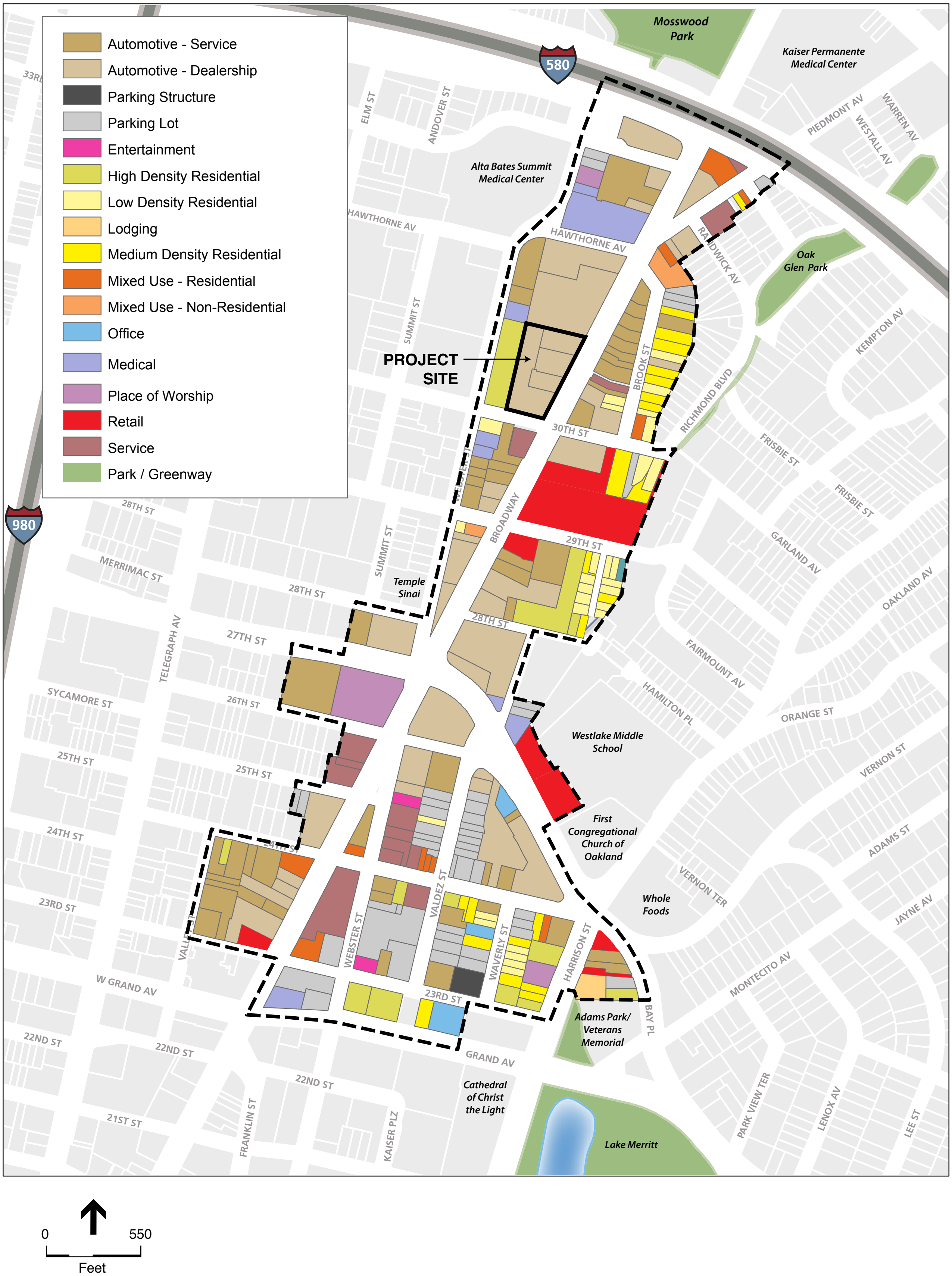
Existing Project Site Land Uses

The project site is located at 3001-3019 Broadway, at the northwest corner of Broadway and 30th Street in Oakland's Broadway Auto Row. The project site is 1.9 acres of developable land, currently used as a private surface parking lot. As discussed in further detail below, under *Surrounding Existing Land Uses*, the project site is currently part of the land use pattern along Broadway of lots with no structures and surface parking lots, which contribute to the overall lack of activity in the project vicinity.

Surrounding Existing Land Uses

As introduced in Chapter 3, *Project Description*, the area surrounding the project site includes a mix of health-related institutional, automotive sales and service, and commercial entertainment and dining uses. Directly abutting the project site on the **north** is a paved parking lot and a historic auto dealership building (McConnell GMC Pontiac Cadillac/Bay City Chevrolet, 3093 Broadway) that extends north to Hawthorne Avenue. Further north is the Interstate 580 (I-580) overpass and the Kaiser Permanente Oakland Medical Center beyond that. Abutting the **west** boundary of the site is the Oakland Healthcare and Wellness Center, which is a residential skilled nursing facility for the elderly. Just beyond the skilled nursing facility to the **west and northwest** is "Pill Hill," which includes the Alta Bates Summit Medical Center and other medical-related offices within an approximately 15-square-block area (20 acres) that extends to Telegraph Avenue.

To the **south**, across 30th Street is a bank (Summit Bank), private surface parking, and medical offices that front Webster Street. To the **east**, across and fronting Broadway, are the 3000 Broadway Bar and Restaurant, and a mix of commercial uses (automotive sales and services, plumbing/heating and trenching services, and automotive rental). East of the Broadway frontage (along Brook Street) are additional auto-related uses and single- and multi-family residences throughout the Richmond Avenue neighborhood. **Figure 4.9-1** shows the land uses on the project site and the broader vicinity.



SOURCE: WRT, 2013

The Shops at Broadway Retail Project

Figure 4.9-1
Existing Land Uses

The built character of the project vicinity is varied by use. The majority of buildings are one-story and two-stories, older (built before 1920 or 1950), and originally designed for utilitarian purposes. However, it is the absence of a vibrant built environment that marks the land use character of the project vicinity, particularly along Broadway. Much of the land within the project vicinity is considered underutilized, particularly along Broadway. The overall lack of activity in the area is due to the prevalence of lots developed with very low floor area ratios, lots with no or abandoned structures, lots used for surface parking (such as the project site), which include a predominance of automobile-related uses, including long stretches of surface parking lots and numerous private driveways.

The numerous driveways along Broadway are pertinent to the existing bicycle and pedestrian facilities supporting the project site. Broadway provides a bicycle lane on both sides of the street adjacent to the project site. Other existing bicycle facilities near the project site include arterial bike routes on Webster Street and bicycle lanes on 27th Street. Pedestrian facilities around the project site include sidewalks, crosswalks, and pedestrian signals. Ten-foot-side sidewalks are provided on both frontages of the project site (Broadway and 30th Street). Also, all approaches of the signalized 30th Street/Broadway intersection, adjacent to the project site, provides striped crosswalks, audible signals, and curb ramps, but do not provide pedestrian signal heads. Just northwest of the project site, a midblock high visibility uncontrolled crosswalk (i.e., “ladder crossing”) is provided across Broadway.

The project vicinity is served by several Alameda-Contra Costa Transit District (AC Transit) bus routes, with the nearest bus stop to the project site located along southbound Broadway just north of 30th Street, adjacent to the project site. The nearest BART stations to the project site are the 19th Street station, about 0.8 miles south of the project site and the MacArthur Station, about one mile northwest of the site. Regional freeway access to the area where the project site is located is provided by I-580, Interstate 980 (I-980), and State Route 24.

(See more detailed description of area transportation services and facilities to the project site and vicinity in the Existing Setting discussion of Section 4.12, *Transportation and Circulation*, of this Draft EIR.)

4.9.2 Regulatory Setting

Local Plans and Policies

Presented below are applicable plans and regulations that pertain to the development of the Project, followed by a discussion of the overall consistency (or inconsistency) with each plan.

City of Oakland General Plan

The General Plan establishes comprehensive, long-term land use policies for the City and provides the primary policy direction for development in the City and the project site. The General Plan comprises a series of elements, each of which deals with a particular topic, which apply citywide. Consistent with state law, the General Plan includes the *Land Use and*

Transportation Element; the *Historic Preservation Element*; the *Open Space, Conservation, and Recreation Element*; the *Safety Element*; the *Housing Element*; the *Noise Element*; and the *Scenic Highways Element*. The *Bicycle Master Plan Update*, and *Pedestrian Master Plan* have also been adopted into, and are now a part of, the General Plan.

Conflicts with a General Plan do not inherently result in a significant effect on the environment within the context of CEQA. As stated in Section 15358(b) of the CEQA Guidelines, "[e]ffects analyzed under CEQA must be related to a physical change." Section 15125(d) of the Guidelines states that EIRs shall discuss any inconsistencies between the proposed project and applicable General Plans.

Further, Appendix G of the CEQA Guidelines (Environmental Checklist Form) makes explicit the focus on *environmental* policies and plans, asking if the project would "conflict with any applicable land use plan, policy, or regulation . . . *adopted for the purpose of avoiding or mitigating an environmental effect*" (emphasis added). Even a response in the affirmative, however, does not necessarily indicate the project would have a significant effect, unless a physical change would occur. To the extent that physical impacts may result from such conflicts, such physical impacts are analyzed elsewhere in this EIR. The compatibility of the Project with General Plan policies that do not relate to physical environmental issues will be considered by decision-makers as part of their decision whether to approve or disapprove the Project.

Regarding a project's consistency with the General Plan in the context of CEQA, the Oakland General Plan states the following:

> The General Plan contains many policies which may in some cases address different goals, policies and objectives and thus some policies may compete with each other. The Planning Commission and City Council, in deciding whether to approve a proposed project, must decide whether, on balance, the project is consistent (i.e., in general harmony) with the General Plan. The fact that a specific project does not meet all General Plan goals, policies and objectives does not inherently result in a significant effect on the environment within the context of the California Environmental Quality Act (CEQA).[1]

The General Plan includes goals and policies that apply broadly to land use and development across the City, and that have been *adopted for the purpose of avoiding or mitigating an environmental effect*, in each of its aforementioned elements. This Land Use, Plans and Policies section of the EIR focuses on General Plan policies most directly pertaining to land use, which are primarily in the Land Use and Transportation Element and its associated *Bicycle Master Plan Update* and *Pedestrian Master Plan*. Applicable policies of other General Plan elements are discussed in the relevant sections of this EIR, as specified further below.

Land Use and Transportation Element (LUTE)

The City adopted the General Plan Land Use and Transportation Element (LUTE) on March 24, 1998. The LUTE identifies policies for utilizing Oakland's land as change takes place and sets forth an action program to implement the land use policy through development controls and other

1 City Council Resolution No. 79312 C.M.S.; adopted June 2005.

strategies. The General Plan identifies five places, known as Showcase Districts. The project site falls within Oakland's Downtown Showcase District intended to promote a mixture of vibrant and unique districts with around-the-clock activity, continued expansion of job opportunities, and growing residential population.

The General Plan organizes the City into six general planning areas, and the project site falls within the Central/Chinatown planning area's Auto Row target area for which the LUTE also identifies goals and policies focused on the need to develop business attraction strategies to support existing automobile dealership activities while developing complementary uses and improving physical conditions of pedestrian and bicycle facilities. The LUTE also identifies a strategy objective of growth and change for the Broadway Corridor.

The project site falls within the *Community Commercial* General Plan land use classification, the intent of which is to "identify, create, maintain and enhance areas suitable for a wide variety of commercial and institutional operations along the City's major corridors and in shopping districts or centers."

Areas west of the project site are in the *Institutional* General Plan land use classification, the intent of which is to "create, maintain, and enhance areas appropriate for educational facilities, cultural and institutional uses, health services and medical uses as well as other uses of similar character."

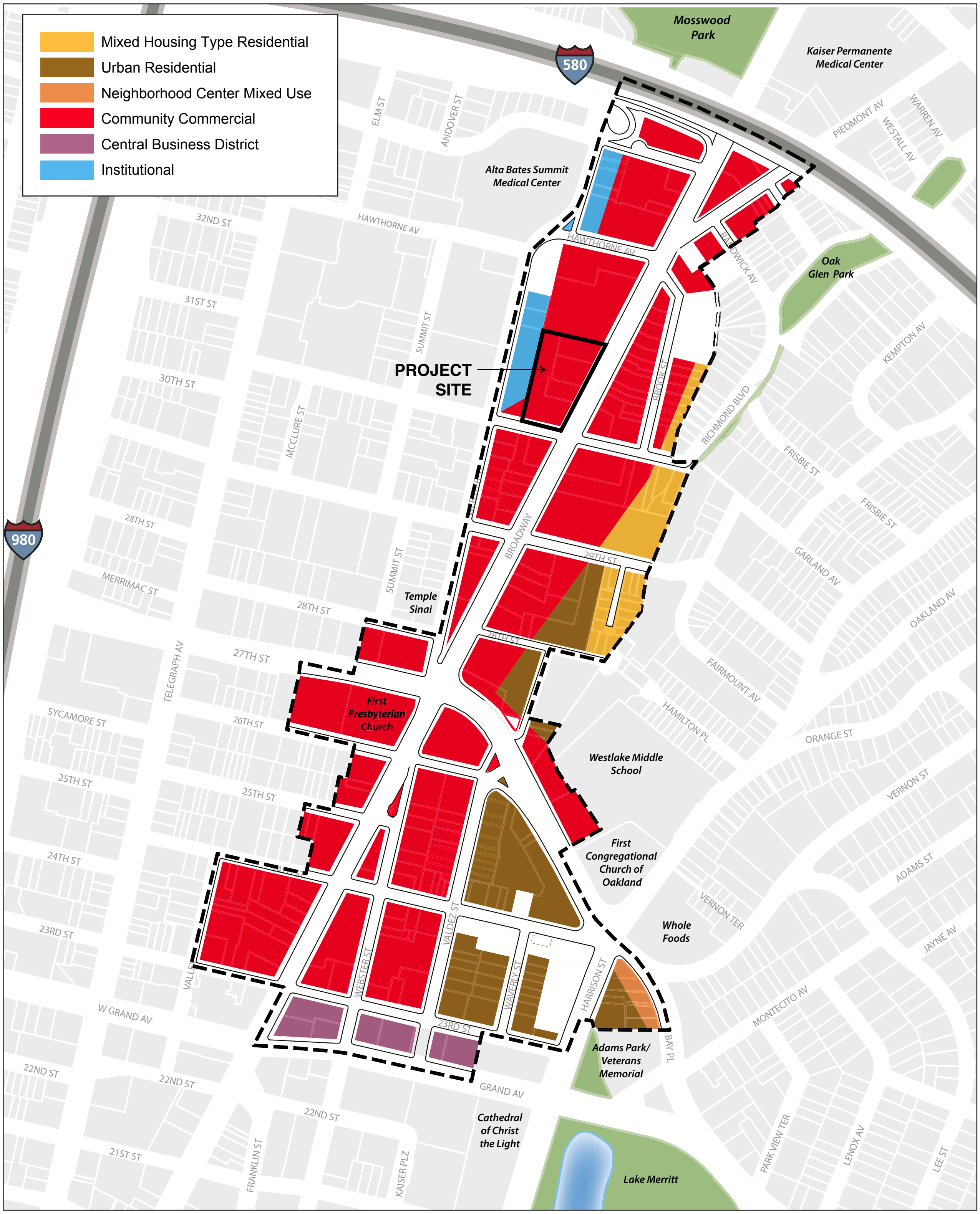
Figure 4.9-2 depicts the General Plan land use classifications for the project site and vicinity.

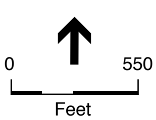
Bicycle Master Plan Update and Pedestrian Master Plan

In December 2007, the City Council adopted the *Oakland Bicycle Master Plan Update* and in November 2002, the City Council adopted the *Pedestrian Master Plan* as part of the LUTE.

The *Bicycle Master Plan Update* calls for the implementation of the bikeway network improvements including Bike Lanes, Arterial Bike Routes, and Bicycle Boulevards throughout the project vicinity. Major proposed bicycle facilities in the project vicinity include bicycle lanes on Telegraph and Piedmont Avenues and on Broadway north of I-580, and a combination of bicycle lanes and arterial bicycle route on Harrison Street (City of Oakland, 2007).

The Pedestrian Master Plan identifies policies and implementation measures for achieving LUTE policies that promote a walkable city. The Plan designates a Pedestrian Route Network throughout Oakland with a concentration of high priority projects (including "City Routes") within the project vicinity; these include Broadway and Telegraph Avenue as City Routes, 27th Street as a District Route, and Webster and 29th Streets as Neighborhood Routes (City of Oakland, 2002). (See detailed descriptions of specific bicycle and pedestrian facility types in the Existing Bicycle Network and Existing Pedestrian Network discussions in Section 4.12, Transportation and Circulation, of this Draft EIR.





SOURCE: WRT, 2013

The Shops at Broadway Retail Project

Figure 4.9-2

Existing General Plan Land Use Classifications

Other General Plan Elements

As discussed above, other elements of the General Plan contain policies *adopted for the purpose of avoiding or mitigating an environmental effect*, but do not specifically pertain to land use, and are therefore discussed in the relevant sections of this Draft EIR (through Chapter 4). Specifically:

- Policies from the Open Space, Conservation and Recreation (OSCAR) Element are listed and addressed in Sections 4.1, *Aesthetics*; 4.2, *Air Quality*; 4.3, *Biological Resources*; 4.6, *Greenhouse Gases and Climate Change*; 4.8, *Hydrology and Water Quality*; and 4.11, *Public Services* of this Draft EIR.

- Policies from the Scenic Highways Element are listed in Section 4.1, *Aesthetics,* of this Draft EIR.

- Policies from the Historic Preservation Element are listed in Sections 4.4, *Cultural Resources*; and 4.6, *Greenhouse Gases and Climate Change*, of this Draft EIR.

- Policies from the Safety Element are listed in Sections 4.5, *Geology, Soils, and Geohazards*; 4.6, *Greenhouse Gases and Climate Change*; 4.7, *Hazards and Hazardous Materials*; 4.8, *Hydrology and Water Quality*; and 4.11, *Public Services,* of this Draft EIR.

- Policies from the Noise Element are listed in Section 4.10, *Noise,* of this Draft EIR.

Draft Broadway Valdez District Specific Plan

The project site is also located in the Draft Broadway Valdez District Specific Plan Area, for which the City is currently preparing a vision and planning framework for future growth and development in an approximately 95.5-acre area along both sides of Broadway, between Grand Avenue and I-580. The project site is located on the west side of Broadway, approximately 500 feet south of the I-580 overpass. The Final Specific Plan may incorporate changes to the General Plan that may result in changes to the land use designation and development standards for the project site. The Draft Specific Plan establishes a regulatory framework for future land uses and development with the Plan Area. While the Draft Specific Plan proposes changes to the location of certain General Plan land use classifications within the Plan Area (which would take effect if and when the Final Specific Plan is adopted), no changes are envisioned for the project site, which is located in the northern area of the Plan Area where *Community Commercial* will remain (see Figure 4.9-2).

Oakland Planning Code

The Planning Code serves to implement General Plan policies and is found in the Oakland Municipal Code, Title 17. The Planning Code governs land uses and development standards, such as building height, bulk and setback, for specific zoning districts within Oakland. Permits to construct new buildings or to alter or demolish existing ones may not be issued unless the project proposed conforms to the Planning Code or an exception is granted pursuant to provisions of the Planning Code. The project site is currently zoned CC-2 (Community Commercial Zone – 2) and D-BR (Overlay Broadway District).

The intent of the CC-2 zone is to create, maintain, and enhance areas suitable for a wide range of commercial and institutional operations along the City's major corridors and in shopping districts or centers, specifically commercial businesses in the CC-2 zone with direct frontage and access along the City's corridors and commercial areas.

The D-BR overlay combines with commercial and residential zones and was adopted in 2011. The intent of the D-BR overlay is to create, preserve and enhance ground level retail opportunities within the Broadway/Valdez Retail District (or Broadway Valdez District Specific Plan Area). The D-BR overlay was designed specifically for the Broadway Valdez Specific Plan Area in anticipation of the more comprehensive and detailed regulations associated with adoption of the Draft Broadway Valdez Specific Plan discussed above. These zoning regulations were originally adopted in 2008, in order to give the City time to develop a Specific Plan (Broadway Valdez District Specific Plan) to facilitate the development of a regional retail center along this stretch of Broadway and within the Valdez triangle. When adopted, they were considered interim and were set to expire on February 15, 2013. However, because the current process to develop a Specific Plan for the Broadway Valdez District area is now anticipated to be completed in late 2013, the City approved an extension of the effective date of the interim regulations until final City Council adoption of the Broadway Valdez District Specific Plan and associated zoning regulations. The overall intent of the D-BR regulations, which are supplementary to the underlying base zones, is to attract ground-level retail opportunities through permitted, restricted, and limited (including automotive-related) new uses, building height minimum, and minimum setbacks from the sidewalks portions of the Plan Area.

Project Consistency with Oakland Zoning

As noted above, conflicts with zoning regulations, specifically those that do not relate to a physical change, do not inherently result in a significant effect on the environment within the context of CEQA. As an example, zoning regulations include minimum or maximum building setbacks and building heights, and a project's adherence to these requirements may affect potential aesthetics effects, such as shadow or lighting, onto adjacent and nearby sensitive properties. As discussed in Section 4.1, *Aesthetics*, of this Draft EIR, the Project would not have a significant aesthetics effects, including related to shadow or lighting/glare. Overall, the Project would not conflict with existing Oakland Planning Code requirements adopted for the purpose of avoiding or mitigating an environmental effect.

Redevelopment Plan

The project site falls within the Broadway/MacArthur/ San Pablo Redevelopment Plan Project Area.

Broadway/MacArthur/San Pablo Redevelopment Plan

The goals and objectives outlined within this plan that pertain to land use, plans, and policies are listed below:

- ***Goal A*:** Stimulate in-fill development and land assembly opportunities on obsolete, underutilized and vacant properties in the Project Area.
- ***Goal B*:** Stimulate opportunities for adaptive re-use and preservation of existing building stock in the Project Area.
- ***Goal C*:** Attract new businesses and retain existing businesses in the Project Area, providing job training and employment opportunities for Area residents.
- ***Goal G*:** Revitalize neighborhood commercial areas.

Project Consistency with Redevelopment Plan

The Project would be consistent with the major goals of the Redevelopment Plan pertaining to land use, plans, and policies. The Project is in-fill development on an underutilized and vacant property (Goal A), create a new business and employment opportunities for Plan Area residents (Goal C), and contribute to the revitalization of the neighborhood commercial area along Broadway (Goal G). The Project would not result in a conflict with Redevelopment Plan goals that were adopted for the purpose of avoiding or mitigating an environmental effect.

Oakland Energy and Climate Action Plan

An Oakland Energy and Climate Action Plan (ECAP) has been developed to identify, evaluate and recommend prioritized actions to reduce energy consumption and GHG emissions in Oakland. The ECAP identifies energy and climate goals, clarifies policy direction, and identifies priority actions for reducing energy use and GHG emissions. On July 7, 2009, the Oakland City Council directed staff to develop the draft Oakland ECAP using a GHG reduction target equivalent to 36 percent below 2005 GHG emissions by 2020 (City of Oakland, Resolution No. 82129 C.M.S., 2009). The City adopted the ECAP on December 4, 2012 (City of Oakland, 2012). Consistency with the ECAP is evaluated in Section 4.6, *Greenhouse Gases and Climate Change*, of this Draft EIR.

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

There are no City of Oakland SCAs specific to land use.

4.9.3 Impacts and Mitigation Measures

Significance Criteria

The Project would have a significant impact on the environment if it would:

1. Physically divide an established community;
2. Result in a fundamental conflict between adjacent or nearby land uses;

3. Fundamentally conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect and result in a physical change in the environment; or

4. Fundamentally conflict with any applicable habitat conservation plan or natural community conservation plan

Approach to Analysis

This EIR analysis evaluates the general consistency of the Project with applicable land use plans and policies in order to determine the potential for significant environmental impacts. As discussed in the preceding Regulatory Setting discussion in this section, the General Plan has determined that "the fact that a specific project does not meet all General Plan goals, policies, and objectives does not inherently result in a significant effect on the environment within the context of [CEQA]" (City of Oakland, 2005). This analysis considers the Project in light of all existing *adopted* land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect. Each of these policies is cited throughout Chapter 4 of this Draft EIR, as previously specified Regulatory Setting discussion, in addition to those discussed below.

Impacts

Land Use Compatibility / Physical Division of an Established Community

Impact LU-1: The Project would not result in the physical division of an existing community or conflict with adjacent or nearby land uses (Criteria 1 and 2). (Less than Significant)

While unlikely, the Project may include temporary street closures during construction, but no permanent street closures would occur. Therefore no physical division of an existing community would result from the Project. The Project would introduce a one-story development to the vacant Project site. As discussed in the Environmental Setting of this section, this would be consistent with existing development adjacent to the project site and its surrounding area, therefore the proposed Project height also would not physically divide the community.

The Project would transform an existing undeveloped site used for surface parking into a new retail development. The underutilized site contributes to the overall uninviting pedestrian environment of the project vicinity, and the new development would provide a new node for neighborhood services for the area and complement the existing business, entertainment, medical and residential uses nearby.

When considered in the context of this portion of the City and the Broadway Corridor in particular, the Project's transition of land use and land use intensity would benefit and serve the needs of these nearby land uses. A more active and pedestrian friendly environment on the project site could enhance connections to and between the surrounding neighborhoods, particularly on either side of Broadway, with the project site located on Broadway – the central corridor between the established neighborhoods on each side of it. Therefore, the Project would actually help enhance connectivity in the community rather than result in a perceived or physical division. The impact would be less than significant.

In addition, the General Plan contains policy requirements about the compatibility of land uses that must be implemented throughout all of the City's neighborhoods, including those in the area of the project site. Conformance to the General Plan, including LUTE policies listed below, would discourage development of incompatible land uses or land uses that would result in a division within an established community. The Project would be consistent with each of the following LUTE policies regarding land use and that pertain to aspects of the Project or the project site.

- ***Policy N1.8:*** The height and bulk of commercial development in *Neighborhood Mixed Use Center* and *Community Commercial* areas should be compatible with that which is allowed for residential development. The Project is consistent with this policy because it would be one story in height, which would not be incompatible with residential development.

- ***Policy N5.2:*** Residential areas should be buffered and reinforced from conflicting uses through the establishment of performance-based regulations, the removal of non-conforming uses and other tools. The Project is consistent with this policy because it will adhere to required setbacks from adjacent residential facility and implement standard conditions that will ensure no adverse light and noise effects to that use.

The Project's consistency with General Plan policies, including but not limited to those described above and referenced in other sections within Chapter 4 of this Draft EIR, mean that no significant land use impacts related to land use incompatibility or the physical division of an established community would occur as a result of the Project.

Mitigation: None required.

Policy Consistency / Change in Environment

Impact LU-2: The Project would not conflict with applicable land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect (Criterion 3). (Less than Significant)

Conflicts with a General Plan, specifically those that do not relate to a physical change, do not inherently result in a significant effect on the environment within the context of CEQA. The consistency of the Project with General Plan policies related to the physical environment are discussed in other applicable sections of this EIR. Specifically, policies from the LUTE are listed in Sections 4.1, *Aesthetics*; 4.3, *Biological Resources*; 4.6, *Greenhouse Gases and Climate Change*; 4.11, *Public Services*; 4.12, *Transportation and Circulation*; and 4.13 *Utilities and Service Systems,* of this Draft EIR. The Project is consistent with relevant land use policies in the General Plan, as is required by state planning and zoning law. The Project would not conflict with existing General Plan policies adopted for mitigating an environmental effect.

Moreover, the Project would not conflict with the *Bicycle Master Plan Update* or the *Pedestrian Master Plan* because it would comply with the City of Oakland's Standard Conditions of Approval that ensure the submittal, approval and implementation of plans to the City to implement bicycle storage and parking facilities to accommodate the bicycle parking spaces required for the Project. The Project would also be consistent with both of the Plans because it would not alter the public right-of-way in the project vicinity or adversely affect the installation of future facilities. Specific policies from the *Bicycle Master Plan Update* and the *Pedestrian Master Plan* are listed in Section 4.12, *Transportation and Circulation* (under *Local Plans and Policies*). Section 4.12 (under *Consistency with Adopted Policies, Plans or Programs Supporting Alternative Transportation*) also includes further detailed discussion of the Project's consistency with both of these Plans.

In summary, no significant land use impacts related to the consistency of development of the Project with land use policies would occur.

Mitigation: None required.

Habitat and Natural Community Conservation Plans

Impact LU-3: The Project would not fundamentally conflict with any applicable habitat conservation plan or natural community conservation plan (Criterion 4). (Less than Significant)

The project site is not located within or in proximity to an area guided by a Habitat Conservation Plan or Natural Community Conservation Plan. Therefore, the Project would not conflict with such plans.

Mitigation: None required.

Cumulative Impacts

Impact LU-4: The Project, combined with cumulative development in the defined geographic area, including past, present, existing, approved, pending, and reasonably foreseeable future development, does not result in any significant adverse cumulative impacts in the area. (Less than Significant)

Geographic Context

The cumulative geographic context for land use, plans and policy considerations for the project site consists of the project vicinity, including surrounding neighborhoods such as Pill Hill (with Alta Bates Summit Medical Center), the Kaiser Permanente Oakland Medical Center, and nearby residential neighborhoods.

Impacts

As analyzed throughout this section, the Project would not result in a significant land use impact by potentially physically dividing an established community; conflicting with adjacent or nearby land uses; or conflicting with applicable land use plans, policies or regulations adopted for the purpose of avoiding or mitigating an environmental effect. Further, the Project would not be located in or near an area guided by a habitat conservation plan or natural community conservation plan. Thus, the Project would not combine with, or add to, any potential adverse land use impacts that may be associated with other cumulative development, as described in Chapter 4, Section 4.07, Cumulative Development, of this Draft EIR. Similarly, because the Project would not result in a conflict with a land use plan, policy or regulation in manner that could result in a significant environmental effect, whether other present or future development would have such a conflict, the effect would not combine to create cumulative conflict.

In addition, past projects have been, and present and reasonably foreseeable future projects would be, subject to development guidance contained within the General Plan and other applicable land use plans to ensure land use compatibility. Thus cumulative development would not result in significant adverse land use impacts. Based on the information in this land use section and for the reasons summarized above, the Project would not contribute to any significant adverse cumulative land use impacts when considered together with past, present, pending and reasonably foreseeable development.

Mitigation: None required.

4.9.4 References

City of Oakland, 2002. *Pedestrian Master Plan. Part of the Land Use and Transportation Element of the Oakland General Plan*, adopted November 2002.

City of Oakland, 2007. *Land Use and Transportation Element of the Oakland General Plan*, March 24, 1998, amended to June 21, 2007.

City of Oakland, 2007. *Bicycle Master Plan Update. Part of the Land Use and Transportation Element of the Oakland General Plan*, adopted December 2007.

City of Oakland, *Energy And Climate Action Plan* Resolution No. 82129 C.M.S., 2009.

City of Oakland, 2013. *City of Oakland Planning Code.* CEDA: Planning and Zoning. http://www2.oaklandnet.com/oakca1/groups/ceda/documents/report/oak032032.pdf, accessed February 14, 2013.

City of Oakland, 2012. *Energy And Climate Action Plan.* December 4, 2012.

4.10 Noise

This section analyzes potential impacts on the ambient noise environment caused by construction and operation of the Project. It also analyzes the compatibility of the Project with noise-sensitive uses, such as residences and public open spaces within the area. This section describes the environmental and regulatory setting of the project area as well as basics of environmental acoustics, including definitions of terms commonly used in noise analysis. Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary.

4.10.1 Environmental Setting

Technical Background

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the "loudness" of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of decibels (dBA).[1] Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements.

Some representative noise sources and their corresponding A-weighted noise levels are shown in **Table 4.10-1**.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in Table 4.10-1 represent noise measured at a given instant in time; however, noise levels rarely persist consistently over a long period of time. Rather, community noise varies

1 All noise levels reported herein reflect A-weighted decibels unless otherwise stated.

TABLE 4.10-1
TYPICAL NOISE LEVELS

Noise Level (dBA)	Outdoor Activity	Indoor Activity
90+	Gas lawn mower at 3 feet, jet flyover at 1,000 feet	Rock Band
80-90	Diesel truck at 50 feet	Loud television at 3 feet
70-80	Gas lawn mower at 100 feet, noisy urban area	Garbage disposal at 3 feet, vacuum cleaner at 10 feet
60-70	Commercial area	Normal speech at 3 feet
40-60	Quiet urban daytime, traffic at 300 feet	Large business office, dishwasher next room
20-40	Quiet rural, suburban nighttime	Concert hall (background), library, bedroom at night
10-20		Broadcast / recording studio
0	Lowest threshold of human hearing	Lowest threshold of human hearing

SOURCE: Modified from Caltrans, 2009.

continuously over time because of the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and wind. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment varies the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to accurately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level, which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level for a specified period of time.

L_{50}: The noise level that is equaled or exceeded 50 percent of the specified time. This is the median noise level during the specified time.

L_{90}: The noise level that is equaled or exceeded 90 percent of the specified time. The L_{90} is often considered the background noise level averaged over the specified time.

DNL: The Day/Night Average Sound Level is the 24-hour day and night A-weighed noise exposure level, which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night. Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance from nighttime noise. (Also referred to as "Ldn.")

CNEL: Similar to the DNL, the Community Noise Equivalent Level (CNEL) adds a 5-dBA "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

Effects of Noise on People

The effects of noise on people can be placed into three categories:

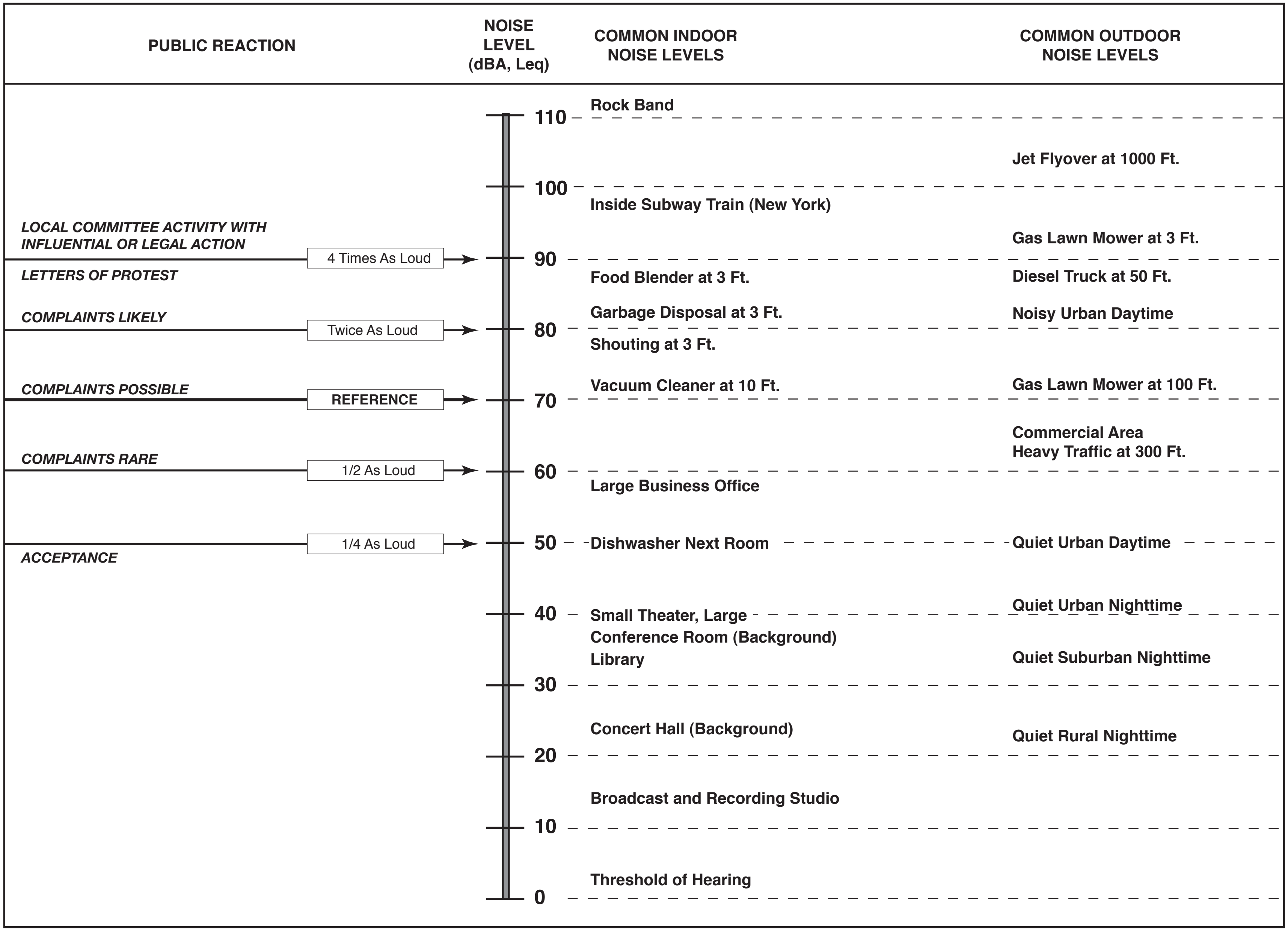
- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories (see **Figure 4.10-1**). Workers in industrial plants generally experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in the individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Under controlled conditions in an acoustics laboratory, the trained healthy human ear is able to discern changes in sound levels of 1 dBA;
- Outside these controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise;
- It is widely accepted that the average healthy ear, however, can barely perceive changes in the noise level of 3 dBA;
- A change in level of 5 dBA is a readily perceptible increase in noise level; and
- A 10 dBA change is recognized as twice as loud as the original source (Caltrans, 2009).

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.



SOURCE: Caltrans Transportation Laboratory Noise Manual, 1982; and modification by ESA

Figure 4.10-1
Effects of Noise on People

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 to 7.5 dBA per doubling of distance from the source, depending on the topography of the area and environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Widely distributed noise, such as a large industrial facility spread over many acres or a street with moving vehicles (known as a "line" source), would typically attenuate at a lower rate, approximately 3 to 4.5 dBA each time the distance doubles from the source, which also depends on environmental conditions (Caltrans, 2009). Noise from large construction sites would exhibit characteristics of both "point" and "line" sources, and attenuation will therefore generally range between 4.5 and 7.5 dBA each time the distance doubles.

Existing Noise Sources and Levels

Transportation sources, such as automobiles, trucks, trains, and aircraft, are the principal sources of noise in the urban environment. Along major transportation corridors, noise levels can reach 80 DNL, while along arterial streets, noise levels typically range from 65 to 70 DNL. However, noise levels on roadways, like all areas, can be affected by intervening development, topography, or landscaping. Industrial and commercial equipment and operations also contribute to the ambient noise environment in their vicinities.

Roadway traffic generates noise throughout the City of Oakland. Railroad trains and BART intermittently generate noise levels that are significant along the railroad tracks. General aviation aircraft and jet aircraft contribute to intermittent noise levels in the City. Noise is also generated on individual parcels whether industrial, commercial or residential. These noise sources do not affect the overall noise environment throughout the community (Illingworth and Rodkin, 2004).

To characterize the noise environment within the project area, short-term noise monitoring was conducted at the project site and at nearby receptors to the project site. **Table 4.10-2** presents this noise data as monitored in 2013. Primary noise sources in the project area vicinity include vehicle traffic on Broadway, including AC Transit diesel bus activity for which there is a stop in front of the project site. Audible street crossing signals also contribute to the ambient noise environment of the project area. No major stationary or industrial noise sources are located within the area.

TABLE 4.10-2
MONITORED NOISE ENVIRONMENTS WITHIN THE PROJECT AREA

Location	Duration	Noise Level (Leq, dBA)	Noise Level (L_{33}, dBA)	Major Noise Source
Oakland Wellness Center 3030 Webster Street	15 Minute	60.6	68.8	Vehicle traffic
Broadway at 30th Street	15 Minute	66.8	66	Vehicle traffic / Bus stop / crosswalk warning

SOURCE: ESA, 2013.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others because of the amount of noise exposure, in terms of both duration and insulation from noise, and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas generally are more sensitive to noise than are commercial and industrial land uses.

The project area consists of a mixture of commercial, medical and office space. The Oakland Healthcare and Wellness Center is a skilled nursing facility, which is a residential health facility for the elderly, located adjacent to the west property line of the project site. Other than this residential health facility, the nearest sensitive receptors would be the Brook Street residential community approximately 300 feet east of the project site, on the other side of Broadway.

4.10.2 Regulatory Setting

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans; local noise ordinances establish standards and procedures for addressing specific noise sources and activities.

Federal

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under Title 40 Code of Federal Regulations (CFR) Part 205, Subpart B. The federal truck pass-by noise standard is 80 dB at 15 meters from the centerline of the vehicle pathway. These standards are implemented through regulatory controls on truck manufacturers.

State of California

Aircraft Operations

The California Airport Noise Standards, Title 21, Section 5000 et seq. of the California Code of Regulations (CCR) apply to any airport that is deemed to have a “noise problem” as established by the local County Board of Supervisors in accordance with the provisions in the regulation. Currently, within the Bay Area, Norman Y. Mineta-San José International Airport and San Francisco International Airport have been given this designation. The Standards establish a noise exposure limit “acceptable to a reasonable person residing in the vicinity of an airport” of 65 dB CNEL.

Vehicle Operations

The State of California establishes noise limits for vehicles licensed to operate on public roads. The pass-by standard for heavy trucks is consistent with the federal limit of 80 dB. The pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dB at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanctions on vehicle operators by state and local law enforcement officials.

Noise Insulation Standard

The California Noise Insulation Standards found in CCR, Title 24 establish requirements for new multi-family residential units, hotels, and motels that may be subject to relatively high levels of transportation noise. In this case, the noise insulation criterion is 45 dB L_{dn}/CNEL inside noise-sensitive spaces. For developments with exterior transportation noise exposure exceeding 60 dB L_{dn}/CNEL, an acoustical analysis and mitigation (if required) must be provided showing compliance with the 45 dB L_{dn}/CNEL interior noise exposure limit.

Local Plans and Policies

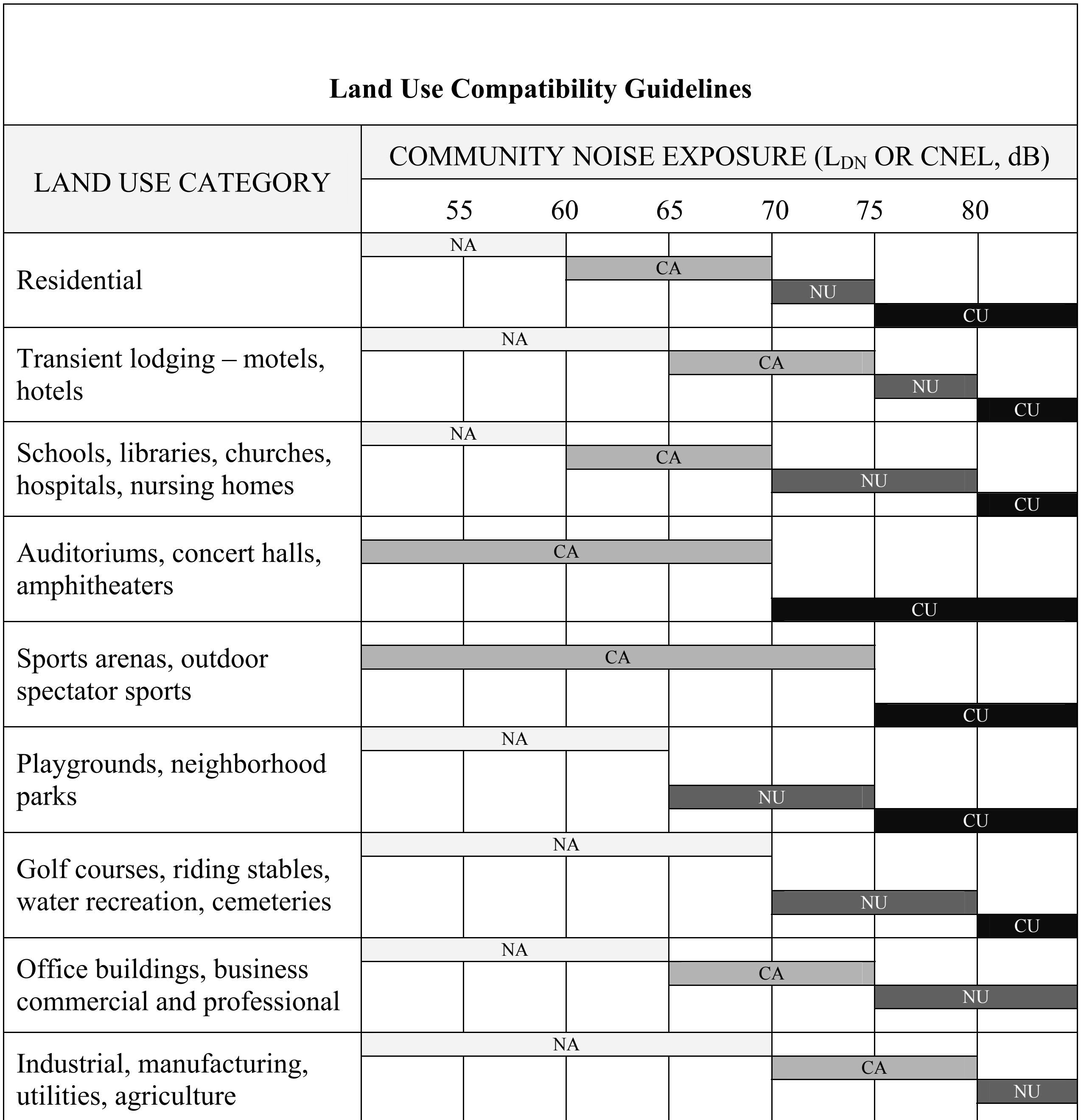
City of Oakland General Plan

The Oakland General Plan contains guidelines for determining the compatibility of various land uses with different outdoor noise environments (City of Oakland, 2005). The Noise Element recognizes that some land uses are more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. The City uses state noise guidelines for judging the compatibility between various land uses and their noise environments, which are summarized in **Figure 4.10-2** for various common land uses.

The Oakland General Plan Noise Element also identifies maximum interior noise levels generally considered acceptable for various common land uses (with windows closed). Relevant to the Project, 55 dB is the maximum level acceptable for retail, banks, restaurants, and sports clubs. The Noise Element contains the following applicable goals and policies:

> **Goal 1:** To protect Oakland's quality of life and the physical and mental well-being of residents and others in the City by reducing the community's exposure to noise; and
>
> **Goal 2:** To safeguard Oakland's economic welfare by mitigating noise incompatibilities among commercial, industrial and residential land uses.

- ***Policy 1:*** Ensure the compatibility of existing and, especially, of proposed development projects not only with neighboring land uses but also with their surrounding noise environment.
- ***Policy 2:*** Protect the noise environment by controlling the generation of noise by both stationary and mobile noise sources.
- ***Policy 3:*** Reduce the community's exposure to noise by minimizing the noise levels that are *received* by Oakland residents and others in the City. (This policy addresses the *reception* of noise whereas Policy 2 addresses the *generation* of noise.)



NA	NORMALLY ACCEPTABLE: Development may occur without an analysis of potential noise impacts *to the proposed development* (though it might still be necessary to analyze noise impacts that the project might have *on its surroundings*).
CA	CONDITIONALLY ACCEPTABLE: Development should be undertaken only after an analysis of noise-reduction requirements is conducted and if necessary noise-mitigating features are included.
NU	NORMALLY UNACCEPTABLE: Development should generally be discouraged; it may be undertaken only if a detailed analysis of the noise-reduction requirements is conducted, and if highly effective noise mitigation features are included.
CU	CLEARLY UNACCEPTABLE: Development should not be undertaken.

SOURCE: City of Oakland, 2011

Figure 4.10-2
Land Use Compatibility Guidelines

City of Oakland Noise Ordinance

The City of Oakland also regulates noise through enforcement of its Noise Ordinance, which is found in Sections 8.18 and 17.120 of the Oakland Municipal Code. Per Chapter 8.18.020, the persistent maintenance or emission of any noise or sound produced by human, animal or mechanical means, between the hours of 9:00 p.m. and 7:00 a.m. which shall disturb the peace or comfort, or be injurious to the health of any person shall constitute a nuisance. Failure to comply with the following provisions shall constitute a nuisance.

A. All construction equipment powered by internal combustion engines shall be properly muffled and maintained. Unnecessary idling of internal combustion engines is prohibited.

B. All stationery noise-generating construction equipment such as tree grinders and air compressors are to be located as far as is practical from existing residences.

C. Quiet construction equipment, particularly air compressors, is to be selected whenever possible.

D. Use of pile drivers and jack hammers shall be prohibited on Sundays and holidays, except for emergencies and as approved in advance by the Building Official.

Whenever the existence of any such nuisance shall come to the attention of the Health Officer, it shall be his or her duty to notify in writing the occupant of the premises upon which such nuisance exists, specifying the measures necessary to abate such nuisance, and unless the same is abated within forty-eight (48) hours thereafter, the occupant so notified shall be guilty of an infraction, and the Health Officer shall summarily abate such nuisance.

Chapter 17.120.050 of the Oakland Planning Code regulates operational noise from stationary sources, as cities and counties do not have regulatory authority over noise from mobile sources (transportation noise). As mentioned above, transportation noise is regulated at the state and federal level by noise limits placed on vehicle manufacturers. **Table 4.10-3** presents maximum allowable receiving noise standards applicable to long-term exposure for residential and civic land uses, for noise from stationary noise sources (not transportation noise). Once constructed, noise from a stationary source would be limited by the standards in Table 4.10-3. For example, between 7:00 a.m. and 10:00 p.m., residential and civic land uses, including public open spaces, may only be exposed to noises up to 60 dBA for a period of 20 cumulative minutes in a one-hour time period and a maximum of 80 dBA. The Noise Ordinance states that if the measured ambient noise level exceeds the applicable noise level standard in any category, then the stated applicable noise level shall be adjusted so as to equal the ambient noise level. In other words, if existing noise is measured to be louder than the maximum allowed (i.e., the “applicable noise level standard”), the existing noise level shall be considered the maximum allowed.

Per Chapter 17.120.060 of the Oakland Planning Code, all activities, except those located within the M-40 zone, or in the M-30 zone more than 400 feet from any legal residentially occupied property, shall be so operated as not to create a vibration which is perceptible without instruments by the average person at or beyond any lot line of the lot containing such activities. Ground

TABLE 4.10-3
CITY OF OAKLAND OPERATIONAL NOISE STANDARDS AT RECEIVING PROPERTY LINE, DBA[1]
(from Stationary Sources)

Receiving Land Use	Cumulative Number of Minutes in a 1-Hour Time Period[2]	Maximum Allowable Noise Level Standards (dBA)	
		Daytime 7:00 a.m. to 10:00 p.m.	Nighttime 10:00 p.m. to 7:00 a.m.
Residential and Civic[3]	20 (L_{33})	60	45
	10 ($L_{16.7}$)	65	50
	5 ($L_{8.3}$)	70	55
	1 ($L_{1.7}$)	75	60
	0 (L_{max})	80	65
		Anytime	
Commercial	20 (L_{33})	65	
	10 ($L_{16.7}$)	70	
	5 ($L_{8.3}$)	75	
	1 ($L_{1.7}$)	80	
	0 (L_{max})	85	
		Anytime	
Manufacturing, Mining, and Quarrying	20 (L_{33})	70	
	10 ($L_{16.7}$)	75	
	5 ($L_{8.3}$)	80	
	1 ($L_{1.7}$)	85	
	0 (L_{max})	90	

1 These standards are reduced 5 dBA for simple tone noise, noise consisting primarily of speech or music, or recurring impact noise. If the ambient noise level exceeds these standards, the standard shall be adjusted to equal the ambient noise level.
2 Lx represents the noise level that is exceeded X percent of a given period. Lmax is the maximum instantaneous noise level.
3 Legal residences, schools and childcare facilities, health care or nursing home, public open space, or similarly sensitive land uses.

SOURCE: City of Oakland, Planning Code Chapter 17.120.050. A, B, and C, 2008.

vibration caused by motor vehicles, trains, and temporary construction or demolition work is exempted from this standard (Ord. 11895 Section 8, 1996: prior planning code Section 7711).

Table 4.10-4 presents noise level standards from the Noise Ordinance that applies to temporary exposure to short- and long-term construction noise. In this context, short-term refers to construction activity lasting less than 10 days at a time while long-term refers to construction activities lasting greater than 10 days at a time.

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

The City of Oakland's SCA relevant to reducing noise and vibration impacts due to the Project are listed below. If the Project is approved by the City, all applicable SCA would be adopted as conditions of approval and required to be implemented, as applicable, to help ensure less-than-significant impacts from noise and vibration. The SCA are incorporated and required as part of all approved projects, so they are not listed as mitigation measures.

TABLE 4.10-4
CITY OF OAKLAND CONSTRUCTION NOISE STANDARDS AT RECEIVING PROPERTY LINE, DBA

Receiving Land Use	Daily 7:00 a.m. to 7:00 p.m.	Weekends 9:00 a.m. to 8:00 p.m.
Short-Term Operation (less than 10 days)		
Residential	80	65
Commercial, Industrial	85	70
Long-Term Operation (more than 10 days)		
Residential	65	55
Commercial, Industrial	70	60

During the hours of 7 p.m. to 7 a.m. on weekdays and 8 p.m. to 9 a.m. on weekends and federal holidays, noise levels received by any land use from construction or demolition shall not exceed the applicable nighttime operational noise level standard (see Table 4.10-3).
If the ambient noise level exceeds these standards, the standard shall be adjusted to equal the ambient noise level.

SOURCE: City of Oakland, Municipal Code Chapter 17.120.050.G.

- **NOI SCA 1: Days/Hours of Construction Operation**

  Ongoing throughout demolition, grading, and/or construction. The project applicant shall require construction contractors to limit standard construction activities as follows:

  a) Construction activities are limited to between 7:00 a.m. and 7:00 p.m. Monday through Friday, except that pile driving and/or other extreme noise generating activities greater than 90 dBA shall be limited to between 8:00 a.m. and 4:00 p.m. Monday through Friday.

  b) Any construction activity proposed to occur outside of the standard hours of 7:00 a.m. to 7:00 p.m. Monday through Friday for special activities (such as concrete pouring which may require more continuous amounts of time) shall be evaluated on a case by case basis, with criteria including the proximity of residential uses and a consideration of resident's preferences for whether the activity is acceptable if the overall duration of construction is shortened and such construction activities shall only be allowed with the prior written authorization of the Building Services Division.

  c) Construction activity shall not occur on Saturdays, with the following possible exceptions:

     i. Prior to the building being enclosed, requests for Saturday construction for special activities (such as concrete pouring which may require more continuous amounts of time), shall be evaluated on a case by case basis, with criteria including the proximity of residential uses and a consideration of resident's preferences for whether the activity is acceptable if the overall duration of construction is shortened. Such construction activities shall only be allowed on Saturdays with the prior written authorization of the Building Services Division.

     ii. After the building is enclosed, requests for Saturday construction activities shall only be allowed on Saturdays with the prior written authorization of the Building Services Division, and only then within the interior of the building with the doors and windows closed.

d) No extreme noise generating activities (greater than 90 dBA) shall be allowed on Saturdays, with no exceptions.

e) No construction activity shall take place on Sundays or federal holidays.

f) Construction activities include but are not limited to: truck idling, moving equipment (including trucks, elevators, etc) or materials, deliveries, and construction meetings held on-site in a non-enclosed area.

g) Applicant shall use temporary power poles instead of generators where feasible.

- **NOI SCA 2: Noise Control**

  Ongoing throughout demolition, grading, and/or construction. To reduce noise impacts due to construction, the project applicant shall require construction contractors to implement a site-specific noise reduction program, subject to the Planning and Zoning Division and the Building Services Division review and approval, which includes the following measures:

  a) Equipment and trucks used for project construction shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).

  b) Except as provided herein, impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used, if such jackets are commercially available and this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures.

  c) Stationary noise sources shall be located as far from adjacent receptors as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or other measures as determined by the City to provide equivalent noise reduction.

  d) The noisiest phases of construction shall be limited to less than 10 days at a time. Exceptions may be allowed if the City determined an extension is necessary and all available noise reduction controls are implemented.

- **NOI SCA 3: Noise Complaint Procedures**

  Ongoing throughout demolition, grading, and/or construction. Prior to the issuance of each building permit, along with the submission of construction documents, the project applicant shall submit to the Building Services Division a list of measures to respond to and track complaints pertaining to construction noise. These measures shall include:

  a) A procedure and phone numbers for notifying the Building Services Division staff and Oakland Police Department; (during regular construction hours and off-hours);

b) A sign posted on-site pertaining with permitted construction days and hours and complaint procedures and who to notify in the event of a problem. The sign shall also include a listing of both the City and construction contractor's telephone numbers (during regular construction hours and off-hours);

c) The designation of an on-site construction complaint and enforcement manager for the project;

d) Notification of neighbors and occupants within 300 feet of the project construction area at least 30 days in advance of extreme noise generating activities about the estimated duration of the activity; and

e) A preconstruction meeting shall be held with the job inspectors and the general contractor/on-site project manager to confirm that noise measures and practices (including construction hours, neighborhood notification, posted signs, etc.) are completed.

- **NOI SCA 4: Interior Noise**

  Prior to issuance of a building permit. If necessary to comply with the interior noise requirements of the City of Oakland's General Plan Noise Element and achieve an acceptable interior noise level, noise reduction in the form of sound-rated assemblies (i.e., windows, exterior doors, and walls) shall be incorporated into project building design, based upon recommendations of a qualified acoustical engineer and submitted to the Building Services Division for review and approval. Final recommendations for sound-rated assemblies would depend on the specific building designs and layout of buildings on the site and shall be determined during the design phases. Written confirmation by the acoustical consultant, HVAC or HERS specialist, shall be submitted for City review and approval, prior to Certificate of Occupancy (or equivalent) that:

  (a) Quality control was exercised during construction to ensure all air-gaps and penetrations of the building shell are controlled and sealed; and

  (b) Demonstrates compliance with interior noise standards based upon performance testing of a sample unit.

  (c) Inclusion of a Statement of Disclosure Notice in the CC&R's on the lease or title to all new tenants or owners of the units acknowledging the noise generating activity and the single event noise occurrences. Potential features/measures to reduce interior noise could include, but are not limited to, the following:

    i. Installation of an alternative form of ventilation in all units identified in the acoustical analysis as not being able to meet the interior noise requirements due to adjacency to a noise generating activity, filtration of ambient make-up air in each unit and analysis of ventilation noise if ventilation is included in the recommendations by the acoustical analysis**.**

    ii. Prohibition of Z-duct construction.

- **NOI SCA 5: Operational Noise - General**

  Ongoing. Noise levels from the activity, property, or any mechanical equipment on site shall comply with the performance standards of Section 17.120 of the Oakland Planning Code and Section 8.18 of the Oakland Municipal Code. If noise levels exceed these standards, the activity causing the noise shall be abated until appropriate noise reduction measures have been installed and compliance verified by the Planning and Zoning Division and Building Services.

- **NOI SCA 6: Vibration**

  A qualified acoustical consultant shall be retained by the project applicant during the design phase of the project to comment on structural design as it relates to reducing groundborne vibration at the project site. If required in order to reduce groundborne vibration to acceptable levels, the project applicant shall incorporate special building methods to reduce groundborne vibration being transmitted into project structures. The City shall review and approve the recommendations of the acoustical consultant and the plans implementing such recommendations. Applicant shall implement the approved plans. Potential methods include the following:

  (a) Isolation of foundation and footings using resilient elements such as rubber bearing pads or springs, such as a "spring isolation" system that consists of resilient spring supports that can support the podium or residential foundations. The specific system shall be selected so that it can properly support the structural loads, and provide adequate filtering of ground-borne vibration to the residences above.

  (b) Trenching, which involves excavating soil between the railway/freeway and the project so that the vibration path is interrupted, thereby reducing the vibration levels before they enter the project's structures. Since the reduction in vibration level is based on a ratio between trench depth and vibration wavelength, additional measurements shall be conducted to determine the vibration wavelengths affecting the project. Based on the resulting measurement findings, an adequate trench depth and, if required, suitable fill shall be identified (such as foamed styrene packing pellets (i.e., Styrofoam) or low-density polyethylene).

- **NOI SCA 7: Pile Driving and Other Extreme Noise Generators**

  Ongoing throughout demolition, grading, and/or construction. To further reduce potential pier drilling, pile driving and/or other extreme noise generating construction impacts greater than 90dBA, a set of site-specific noise attenuation measures shall be completed under the supervision of a qualified acoustical consultant. Prior to commencing construction, a plan for such measures shall be submitted for review and approval by the Planning and Zoning Division and the Building Services Division to ensure that maximum feasible noise attenuation will be achieved. This plan shall be based on the final design of the project. A third-party peer review, paid for by the project applicant, may be required to assist the City in evaluating the feasibility and effectiveness of the noise reduction plan submitted by the project applicant. A special inspection deposit is required to ensure compliance with the noise reduction plan. The amount of the deposit shall be determined by the Building Official, and the deposit shall be submitted by the project applicant concurrent with submittal of the noise reduction plan. The noise reduction plan shall include, but not be limited to, an evaluation of the following measures. These attenuation measures shall include as many of the following control strategies as applicable to the site and construction activity:

  a) Erect temporary plywood noise barriers around the construction site, particularly along on sites adjacent to residential buildings;

  b) Implement "quiet" pile driving technology (such as pre-drilling of piles, the use of more than one pile driver to shorten the total pile driving duration), where feasible, in consideration of geotechnical and structural requirements and conditions;

c) Utilize noise control blankets on the building structure as the building is erected to reduce noise emission from the site;

d) Evaluate the feasibility of noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings by the use of sound blankets for example; and

e) Monitor the effectiveness of noise attenuation measures by taking noise measurements.

- **NOI SCA 8 : Vibrations Adjacent to Historic Structures**

  Prior to issuance of a demolition, grading or building permit. The project applicant shall retain a structural engineer or other appropriate professional to determine threshold levels of vibration and cracking that could damage other nearby historic structures, and design means and methods of construction that shall be utilized to not exceed the thresholds.

4.10.3 Impacts and Mitigation Measures

Significance Criteria

The Project would have a significant impact on the environment if it were to:

1. Generate noise in violation of the City of Oakland Noise Ordinance (Oakland Planning Code section 17.120.050) regarding construction noise, except if an acoustical analysis is performed that identifies recommend measures to reduce potential impacts.[2] During the hours of 7:00 p.m. to 7:00 a.m. on weekdays and 8:00 p.m. to 9:00 a.m. on weekends and federal holidays, noise levels received by any land use from construction or demolition shall not exceed the applicable nighttime operational noise level standard (see Table 4.10-3);

2. Generate noise in violation of the City of Oakland nuisance standards (Oakland Municipal Code section 8.18.020) regarding persistent construction-related noise;

3. Generate noise in violation of the City of Oakland Noise Ordinance (Oakland Planning Code section 17.120.050) regarding operational noise:

4. Generate noise resulting in a 5 dBA permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or, if under a cumulative scenario where the cumulative increase results in a 5 dBA permanent increase in ambient noise levels in the project vicinity without the project (i.e., the cumulative condition including the project compared to the existing conditions) and a 3 dBA permanent increase is attributable to the project (i.e., the cumulative condition including the project compared to the cumulative baseline condition without the project) [**NOTE**: Outside of a laboratory, a 3 dBA change is considered a just-perceivable difference. Therefore, 3 dBA is used to determine if the project-related noise increases are cumulatively considerable. Project-related noise should include both vehicle trips and project operations];

[2] The acoustical analysis must identify, at a minimum, (a) the types of construction equipment expected to be used and the noise levels typically associated with the construction equipment and (b) the surrounding land uses including any sensitive land uses (e.g., schools and childcare facilities, health care and nursing homes, public open space). If sensitive land uses are present, the acoustical analysis must recommend measures to reduce potential impacts.

5. Expose persons to interior Ldn or CNEL greater than 45 dBA for multi-family dwellings, hotels, motels, dormitories and long-term care facilities (and may be extended by local legislative action to include single-family dwellings) per California Noise Insulation Standards (CCR Part 2, Title 24);

6. Expose the project to community noise in conflict with the land use compatibility guidelines of the Oakland General Plan after incorporation of all applicable Standard Conditions of Approval;

7. Expose persons to or generate noise levels in excess of applicable standards established by a regulatory agency (e.g., occupational noise standards of the Occupational Safety and Health Administration [OSHA]);

8. During either project construction or project operation expose persons to or generate groundborne vibration that exceeds the criteria established by the Federal Transit Administration (FTA):

TABLE 4.10-5
GROUNDBORNE VIBRATION IMPACT CRITERIA

Land Use Category	Groundborne Vibration Impact Levels in VdB		
	Frequent Events[1]	**Occasional Events[2]**	**Infrequent Events[3]**
Category 1: Building where vibration would interfere with interior operations.	65	65	65
Category 2: Residences and building where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime use.	75	78	83

NOTE: VdB = vibration decibels.

SOURCE: U.S. Department of Transportation, Federal Transit Administration, Traffic Noise and Vibration Impact Assessment, May 2006.

9. Be located within an airport land use plan and would expose people residing or working in the project area to excessive noise levels; or

10. Be located within the vicinity of a private airstrip, and would expose people residing or working in the project area to excessive noise levels.

Approach to Analysis

Based on the characteristics of the proposed Project and the project location, development of the Project would not result in impacts related to the following criteria. No impact discussion is provided for these topics for the following reasons

- ***Airports.*** The project site is not located within the vicinity of a private airstrip nor is it located within the land use plan area for Oakland Airport or any other airport. Therefore, it can be assumed that no impact would occur with regard to criteria 9 and 10.

- ***OSHA Standards.*** The Project proposes a mix of retail uses. Exposure of persons to, or generation of noise levels in excess of applicable standards of OSHA would occur from industrial uses that are not proposed. OSHA noise exposure standards are implemented at noise levels of 85 dBA for an 8-hour exposure period. Average noise levels monitored within the project area are below 70 dBA. Therefore, it can be assumed that no impact would occur with regard to criterion 7.

Impacts

Construction Noise

Impact NOI-1: The Project would not result in substantial temporary or periodic increases in ambient noise levels in the project area above existing levels without the Project and in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (Criteria 1, 2 and 8). (Less than Significant)

As indicated in Chapter 3, *Project Description*, the Project would allow for demolition and construction for a net increase of approximately 36,000 square feet of high-volume retail land uses and a 158 stall two-level parking deck. Approximately 26,000 square feet of the retail use would be a specialty grocery store/supermarket.

Construction, although typically short-term, can be a significant source of noise. Construction is most significant when it takes place near sensitive land uses, occurs at night, or in early morning hours. Local governments typically regulate noise associated with construction equipment and activities through enforcement of noise ordinance standards, implementation of General Plan policies and imposition of conditions of approval for building or grading permits. **Table 4.10-6** shows typical exterior noise levels at various phases of commercial construction and **Table 4.10-7** shows typical noise levels associated with various types of construction equipment.

TABLE 4.10-6
TYPICAL CONSTRUCTION NOISE LEVELS

Phase	Noise Level (L_{eq})[a]
Ground Clearing	84
Excavation	89
Foundations	78
Erection	85
Exterior Finishing	89
Pile Driving	90-105

[a] Estimates correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase and 200 feet from the other equipment associated with that phase.

SOURCE: U.S. Environmental Protection Agency, *Noise from Construction Equipment and Building Operations, Building Equipment and Home Appliances*, December 1971.

TABLE 4.10-7
TYPICAL MAXIMUM NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA, L_{eq} at 50 feet)
Backhoe	80
Rock Drill	98
Air Compressor	81
Dozer	85
Air Compressor	85
Mobile Crane	83
Grader	85
Front End Loader	85
Trucks	88
Cranes	83
Pile Driver (Sonic)	96
Pile Driver (Impact)	101

SOURCE: FTA, 2006.

The dominant construction equipment noise source is usually a diesel engine. Stationary equipment consists of equipment that generates noise from one general area and includes items such as pumps, generators, compressors, etc. These types of equipment operate at a constant noise level under normal operation and are classified as non-impact equipment. Other types of stationary equipment such as pile drivers, jackhammers, and pavement breakers, etc., produce variable and sporadic noise levels and often produce impact-type noises. Impact equipment is equipment that generates impulsive noise, where impulsive noise is defined as noise of short duration (generally less than one second), high intensity, abrupt onset, rapid decay, and often rapidly changing spectral composition. For impact equipment, the noise is produced by the impact of a mass on a surface, typically repeating over time. Mobile equipment such as dozers, scrapers, graders, etc., may operate with power applied in a cyclic fashion in which a period of full power is followed by a period of reduced power. Other equipment such as compressors, although generally considered to be stationary when operating, can be readily relocated to another location for the next operation. Construction-related activities would temporarily increase ambient noise levels within the project area over approximately 12 months. The anticipated schedule is as follows:

- Demolition 1 week
- Site preparation 1 week
- Excavation/Grading 4 weeks
- Building Construction and Finishing 9 -10 months
- Site Paving 1 week

Construction-related noise levels generally fluctuate depending on the construction phase, equipment type and duration of use, distance between noise source and receptor, the existing noise levels at the receptor, and the presence or absence of barriers between the noise source and receptor. As previously indicated in the *Environmental Setting* of this section, the nearest existing sensitive receptors within the project area is the Oakland Healthcare and Wellness Center west of and adjacent to the project site. The residential units are located approximately 10 to 12 horizontal feet from, and approximately 4 to 10 feet above (grade to grade), where the nearest construction activity would occur (along the intervening property line). Construction activities associated with the Project could expose these nearby residents to noise levels as high as 89 dBA at a distance of 50 feet (as referenced in Table 4.10-6), therefore noise levels would be significantly greater than existing noise levels at the adjacent receptors that are located less than 50 feet away.

The standard construction equipment proposed for the Project do not typically generate vibration levels. Bulldozer blade drops can generate 78 VdB at 50 feet, but this vibration would be considered an infrequent event (i.e., there would be fewer than 30 occurrences in a given day) which would be a less than significant vibration impact with respect to human annoyance. Pile driving, which is an extreme noise activity, is not an anticipated method of construction for the Project.

Implementation of NOI SCA 1, *Days/Hours of Construction Operation,* NOI SCA 2, *Noise Control,* and NOI SCA 3, *Noise Complaint Procedures,* would reduce construction noise levels by limiting hours of construction activities, requiring best available noise control technology, and by requiring a project applicant and/or its contractors to notify any local residents (if any) of construction activities and to track and respond to noise complaints.

Implementation of NOI SCAs 1 through 3 would reduce impacts from construction noise and vibration. SCA’s have been developed by the City of Oakland over the past decade to reduce construction noise impacts. NOI SCA 1 restricts the hours and days of construction activity. NOI SCA 2 requires contractors to implement a construction noise reduction program, while NOI SCA 3 establishes construction noise complaint procedures. These SCA’s are comprehensive in their content and for practical purposes represent all feasible measures available to mitigate construction noise.

Site-Specific Noise Reduction Program and Acoustical Study

Given the close proximity of the sensitive receptor (residences in the Oakland Healthcare and Wellness Center) immediately west of the project site, construction noise levels greater than 90 dBA (i.e., “extreme noise” levels per the SCAs) could occur at the sensitive receptor given the noise levels of the construction equipment and activities associated with the Project, as described above and in Tables 4.10-6 and 4.10-7. For example, assuming the 6 to 7.5 dBA noise level change per doubling of distance of from the noise source, noise at the west property line of the project site could range (intermittently) between 95.5 to 96.5 dBA during excavation (89 dBA at 50 feet from receptor) involving truck activity (88 dBA at 50 feet from receptor).

Therefore, the Project shall implement the following additional site-specific noise control strategies in an effort to further implement NOI SCA 2 and achieve the maximum feasible noise attenuation. These additional strategies are consistent with those cited in NOI SCA 7 to address extreme noise generators and that could be feasible at the project site or adjacent buildings/structures. These additional strategies, combined with the noise control measures in NOI SCA 2, constitute the “site-specific noise reduction program" that the applicant shall require construction contractors to implement, and are subject to the City's review, determination of feasibility and effectiveness, and approval:

1. **Temporary Noise Barrier:** During all construction activities, a temporary noise barrier of approximately 385 feet in length shall be located along or near the west property line of the project site, as shown generally in **Figure 4.10-3**. The noise barrier shall require a maximum 10-foot return on each end and be oriented 45 degrees into the construction site.

   (a) *Construction Site*

   (i) The temporary noise barrier could be constructed of a sound blanket system hung on scaffolding to achieve a minimum height (described below) and to allow the system to be moved or adjusted if necessary to allow construction activity immediately adjacent to the west property line.

   (ii) An alternative temporary noise barrier design could consist of plywood installed on top of a portable concrete K-Rail system which also allows the ability to move or adjust the wall location.

   The minimum height of the temporary noise barrier design "i" or "ii" situated on the project site would range from at least 16 feet tall near the south property line (30th Street end) to 10 feet tall near the north property line, to maintain at least 6 feet of the barrier above the existing retaining wall (which is approximately 10 feet tall at the south property line and four feet tall at the north property line). This minimum height is prescribed to block the line of sight between the receptor property and the construction site for maximum effectiveness.

   (b) *Receptor Site*

   (i) As an alternative to an on-site temporary noise barrier (described above in "a"), the applicant shall coordinate with the owner/operator of the adjacent Oakland Healthcare and Wellness Center property and evaluate the feasibility of locating a temporary noise barrier design on the receptor property, specifically along the elevated walkway between the residential units and the shared property line. This approach would allow a 6-foot-tall barrier on top of the elevated walkway to block the line of sight between the receptor property and the construction site, but would also require a 10-foot long return on each end of the barrier on the construction site, if feasible in a manner that improves the effective noise reduction.

2. **Effectiveness Monitoring.** The applicant shall monitor the effectiveness of the implemented temporary noise barrier design by taking noise measurements during each construction phase (excavation, foundations, erection, interior and exterior finishing). Implementation of the temporary noise barrier designs described in #1 are estimated to achieve noise level reduction of approximately 5 dBA from the construction noise levels at the adjacent receptor, where levels are estimated to be as high as 96.5 dBA at the west property line. Up to 5 dBA is considered the maximum feasible noise attenuation that would be achieved with installation of a temporary noise barrier, and some additional level of additional reduction would be achieved with adherence to NOI SCA 2. The applicant shall submit the recorded noise measurements to the Planning and Zoning Division and the Building Services Division.

SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 4.10-3

Temporary Extreme Noise Barrier Plan

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Implementation of these site-specific noise control strategies and the measures in NOI SCAs 1 through 3 represent all feasible measures available to mitigate construction noise and would reduce construction impacts from noise and vibration to less than significant levels.

Mitigation: None required.

Operational Noise

Impact NOI-2: The Project would not increase operational noise levels in the project area to levels in excess of standards established in the Oakland Noise Ordinance and Planning Code (Criterion 3). (Less than Significant)

Chapter 17.120.050 of the City of Oakland Planning Code specifies the maximum sound level received at residential, public open spaces and commercial land uses. The maximum sound level (L_{max}) received by residential uses cannot exceed 80 dBA and the L_{max} received by commercial land uses cannot exceed 85 dBA. Per Table 4.10-3, stationary source noise received at residential uses must not exceed 60 dBA and commercial land uses cannot exceed 65 dBA during daytime hours as measured at the property line over a 20 minutes in a one-hour time period. However, per the City of Oakland, if existing noise is measured to be louder than the applicable noise level standard, the existing noise level shall be considered the maximum allowed, which is the case along the Broadway frontage of the project site where daytime noise levels were monitored to be 67 dBA and at the adjacent Oakland Healthcare and Wellness Center residential health facility where existing daytime noise levels were monitored to be 61 dBA (see Table 4.10-2).

The Project would generate some noise from heating, ventilating, and air conditioning mechanical equipment located on the northeastern corner of the rooftop. This equipment would be located approximately 240 feet east of the residential health facility and approximately 310 feet from the Brook Street residences and would be shielded by a parapet. Near field sound power levels for the HVAC model are specified as 94 dBA at one meter.

The height of the proposed building would elevate HVAC equipment well beyond the line of sight with any of the surrounding sensitive receptors. Given the distance of the HVAC equipment from sensitive receptors as well as shielding provided by both the parapet and the proposed structure itself (in relation to the residential health facility), noise from this equipment would be reduced to 60 dBA at 240 feet. Since the mechanical equipment would be standardized the equipment's noise generation would not be expected to exceed the City's established thresholds presented in Table 4.10-3. Also, development would adhere to NOI SCA 4, *Interior Noise*, and NOI SCA 5, *Operational Noise (General)*. Therefore, operational noise impacts from the Project related to stationary sources would be less than significant.

Noise would also be generated by vehicle circulation into the elevated parking areas and from delivery trucks. Truck loading bays would be enclosed, have an ingress of 30th Street and an enclosed egress point off of Broadway. Loading bays would be enclosed and with the separate ingress and egress points, the use of back up alarms for delivery trucks would be minimal. The enclosed loading bay would effectively shield truck and loading noise; moreover the bay is located at the northeast corner of the project site, as far away from the nearby sensitive receptor to the west as possible.

Parking Areas/Ramp and other Operational Noise

There would be noise generated as vehicles access the upper parking areas using a ramp along the west side of the proposed structure. These vehicles would pass as close as 30 feet to the upper level residences of the Oakland Healthcare and Wellness Center, including the intervening landscaped buffer (10 feet to 24 feet deep) proposed along the western boundary of the project site. Most of the parking spaces (144 of 162 total spaces) would be located on the upper-level parking deck, thus the majority of vehicle trips to and from the site would use the ramp to access parking. Assuming a ramp speed of 15 miles per hour and a receptor distance of 15 feet from the ramp centerline, these vehicles would generate a peak hour noise level of 50 dBA. The City Municipal Code does not regulate noise from motor vehicles, which is addressed by state and federal requirements on vehicle manufacturers, however this contribution would not substantially increase the existing daytime noise levels monitored at the Oakland Healthcare and Wellness Center of 61 dBA.

While not required to address a CEQA impact, the following recommendation, which will be imposed as a Condition of Approval, would reduce potential noise levels associated with the operational noise generated by vehicles in the parking garage and ramp, as well as other maintenance activities required by the grocery:

> **Recommendation NOI-1:** Acoustical louvers could be installed in any ventilation openings on the west elevation of the ground-level of the garage to reduce the transmission of garage sounds.
>
> **Recommendation NOI-2:** To reduce the noise levels within the garage and further reduce noise emanating from the garage, the underside of the garage ceiling could be fully lined with spray-on thermal/acoustic insulation, and sound-absorptive material could be applied to the ramp walls.
>
> **Recommendation NOI-3:** Potential tire noise could be reduced by avoiding a polished (squeaky) concrete slab surface.
>
> **Recommendation NOI-4:** Power washing of shopping carts should occur within the enclosed loading dock area, or at the far end of the service deck, away from residential neighbors.

Mitigation: None required.

Impact NOI-3: The Project would not expose persons to exterior noise levels in conflict with the land use compatibility guidelines of the Oakland General Plan after incorporation of all applicable Standard Conditions of Approval (Criterion 6). (Less than Significant)

The City of Oakland uses Land Use Compatibility Guidelines to determine noise-affected uses (see Figure 4.10-2 above). For commercial/retail uses, noise environments of 65 DNL or less represent the normally acceptable noise exposure and noise environments of 75 DNL or less represent the conditionally acceptable noise exposure. Noise measurements conducted at the project site are presented in Table 4.10-2. Measurements taken at the western end of the project site indicate that the noise environment in these areas would be in the normally acceptable category for commercial uses. Measurements taken at the eastern site of the project site, along Broadway indicate that the noise environment in these areas would be in the conditionally acceptable category. Conditionally acceptable means that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. This would be achieved by adherence to NOI SCA 4 which requires sound-rated assemblies, and/or other appropriate features/measures to meet land use compatibility requirements.

Mitigation: None required.

Impact NOI-4: The Project would not expose persons to interior Ldn or CNEL greater than 45 dBA for multi-family dwellings, hotels, motels, dormitories and long-term care facilities to noise levels in excess of standards established in the Oakland Noise Ordinance and Planning Code (Criterion 5). (Less than Significant)

The Project would not include multi-family dwellings, hotels, motels, dormitories and long-term care facilities. The Land Use Compatibility standards of the City's General Plan are exterior noise standards which allow for an assessment of exterior noise levels to determine whether standard construction techniques would be sufficient to achieve appropriate noise levels for each land use. For multi-family dwellings, hotels, motels, dormitories and long-term care facilities, the land use compatibility standard of 60 dBA for normally acceptable environments assumes that standard construction techniques would achieve 15 dBA of attenuation and provide for an interior environment of 45 dBA.

Existing noise levels at the closest one of these land uses, the Oakland Healthcare and Wellness Center, were monitored to be 61 dBA during daytime hours. Project generated noise from onsite sources were analyzed in Impact NOI-2 and determined not to appreciably increase these existing ambient noise levels. Consequently, the Project would have a less than significant impact with regard to interior noise exposures.

Mitigation: None required.

Traffic Noise

Impact NOI-5: Traffic generated by Project could substantially increase traffic noise levels in the project area (Criterion 4). (Less than Significant)

Additional vehicles traveling throughout the local roadway network as a result of the Project would increase noise levels adjacent to nearby roads. Based on the City of Oakland's CEQA Thresholds, a project would be considered to generate a significant impact if it resulted in a 5 dBA permanent increase in ambient noise levels in the project vicinity above levels existing without the Project. Noise levels were determined for this analysis using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model and the turning movements in the traffic section for Existing (2012), Existing Plus Project, conditions (see Section 4.12, *Transportation and Circulation*, of this Draft EIR) (see Appendix G).

Peak hour (Saturday) intersection turning data from the traffic study were analyzed to evaluate increases and resulting traffic-generated noise increases on roadway links most affected by Project-related traffic. Saturday has the greatest trip generation and noise levels at other times would be lower. The roadway segments analyzed and the results of the noise increases resulting from modeling are shown in **Table 4.10-8**, below.

TABLE 4.10-8
PEAK-HOUR TRAFFIC NOISE LEVELS IN THE VICINITY OF THE PROJECT

Roadway Segment[a,b]	(A) Existing	(B) Existing Plus Project	(B-A) Difference between Existing Plus Project and Existing[c]	(C) Cumulative No Project (2035)	(D) Cumulative Plus Project (2035)	(D-A) Difference between Cumulative Plus Project and Existing	(D-C) Difference between Cumulative Plus Project and Cumulative No Project[d]
51st Street west of Broadway	68.1	68.1	0.0	69.4	69.4	1.3	0.0
Broadway north of 40th Street	68.1	68.2	0.1	70.7	70.8	2.7	0.1
Telegraph Avenue south of MacArthur Blvd	66.8	66.9	0.1	70.1	70.2	3.4	0.1
MacArthur Blvd east of Telegraph Avenue	65.3	65.3	0.0	68.8	68.8	3.5	0.0
Broadway south of MacArthur Blvd	66.1	66.4	0.3	69.3	69.4	3.3	0.1
Piedmont Avenue south of MacArthur Blvd	63.1	63.5	0.4	66.0	66.2	3.1	0.2
Piedmont Avenue east of Broadway	62.3	62.8	0.5	65.6	65.9	3.6	0.3
30th Street west of Broadway	57.3	61.0	3.7	59.9	62.3	5.0	2.4
29th Street east of Broadway	61.6	61.8	0.2	64.6	64.7	3.1	0.1
27th Street east of Telegraph Avenue	64.3	64.4	0.1	67.4	67.4	3.1	0.0
27th Street east of Broadway	64.6	64.9	0.3	67.9	68.0	3.4	0.1
Broadway south of Grand Avenue	66.1	66.2	0.1	69.1	69.1	2.9	0.0

[a] Road center to receptor distance is 15 meters (approximately 50 feet) for all roadway segments. Noise levels were determined using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model.
[b] The analysis considered the vehicle mix based on – cars 95 percent, medium trucks three percent, and heavy trucks two percent. Traffic speeds for all vehicle classes were set at 30 mph.
[c] Considered significant if the incremental increase in noise from traffic is greater than the existing ambient noise level by 5 dBA Leq, per City of Oakland, CEQA Thresholds/Criteria of Significance Guidelines.
[d] Considered a cumulatively considerable contribution to a significant noise increase if the incremental increase in noise is greater than 3 dBA.

SOURCE: ESA, 2013.

As shown in Table 4.10-8, the increase in traffic noise from the Existing Plus Project scenario compared to the Existing scenario would increase peak hour noise levels by less than 5 dBA at all studied roadway segments. The roadway segment of 30th Street west of Broadway would experience the greatest increase in traffic noise, which would be 3.7 dBA above existing ambient noise levels. However, as the noise increase would not exceed 5 dBA, the noise impact on this roadway segment is not considered to be significant. Overall, traffic noise impacts associated with the project at all analyzed roadway segments in the project vicinity would be less than significant.

Mitigation: None required.

Cumulative Noise Impacts

Impact NOI-6: Traffic generated by the Project, in combination with traffic from past, present, existing, approved, pending and reasonably foreseeable future projects, could substantially increase traffic noise levels in the project area; and construction and operational noise levels in combination with traffic from past, present, existing, approved, pending and reasonably foreseeable future projects, could increase ambient noise levels (Criterion 4). (Less than Significant)

Geographic Context

The geographic area considered for cumulative noise analysis includes areas within and surrounding the project area and roadways examined in the transportation analysis in Section 4.12, *Transportation and Circulation*, of this Draft EIR. These include areas of Oakland that encompass the projects described in Chapter 4, Section 4.07, Cumulative Development, of this Draft EIR and area projects incorporated into the regional travel demand model, as discussed in Section 4.07.2, *Cumulative Context*, in Chapter 4 of this Draft EIR.

Impacts

Longer-term noise from cumulative development, which is the development of the Project combined with past, present, pending, and reasonably foreseeable in the area, would primarily occur from motor vehicle traffic. When considered alone, the Project would generate noise mainly by adding more traffic to the area. Other anticipated projects would contribute to noise in the area due to increased traffic volumes.

As noted in Impact NOI-5 and based on the City of Oakland's CEQA Thresholds, a project would be considered to generate a significant impact if it resulted in a 5 dBA permanent increase in ambient noise levels in the project vicinity above levels existing without the Project. As for Impact NOI-3, noise levels were determined for using the FHWA Traffic Noise Prediction Model and the turning movements in for the Cumulative Plus Project (2035) conditions (see Section 4.12, *Transportation and Circulation*, of this Draft EIR) (see Appendix G). The segments analyzed and the results of the noise increases resulting from modeling are also shown in Table 4.10-8 for

Cumulative Plus Project traffic, which includes Project traffic combined with traffic from other approved or pending projects for the year 2035.

Table 4.10-8 shows the increase in traffic from between the Cumulative Plus Project (2035) scenario and Existing (2012) would increase peak hour noise levels by less than 5 dBA at most roadway segments, except at the roadway segment 30th Street west of Broadway, where the increase is projected to be 5 dBA. However, the contribution of the Project to the 2035 cumulative roadway noise increase (Cumulative No Project compared to Cumulative Plus Project) would only be 2.4 dBA. This contribution is less than the significance threshold of 3 dBA, thus the Project would not have a cumulatively considerable contribution (i.e., more than 3 dBA attributable to the Project) to the cumulative noise condition. The impact would be less than significant.

Construction impacts resulting from cumulative development would remain less than significant as all cumulative development in the cumulative geographic context would incorporate SCAs for construction activities, as discussed in Impact NOI-1. Similarly, operational noise associated primarily with mechanical operations of cumulative development also would be at less than significant levels. All cumulative development would adhere to SCAs for construction noise, which include NOI SCA 1, *Days/Hours of Construction Operation*; NOI SCA 2, *Noise Control*; NOI SCA 3, N*oise Complaint Procedures*; and NOI SCA 7, *Pile Driving and Other Extreme Noise Generators*; and all cumulative development would also adhere to SCAs for operational noise, as discussed in Impact NOI-2, which include NOI SCA 4, *Interior Noise*; NOI SCA 5, *Operational Noise (General)*; and NOI SCA 6, *Vibration*.

Overall, while the cumulative noise impacts associated with traffic noise would be significant, the Project's contribution would be less than significant. Also, cumulative noise impacts associated with construction and operations would be less than significant.

Mitigation: None required.

Impact NOI-7: Stationary noise sources such as rooftop mechanical equipment in combination with traffic generated by the Project; and from past, present, existing, approved, pending and reasonably foreseeable future projects; could substantially increase noise levels at sensitive land uses in the project area; (Criterion 4). (Less than Significant)

The Project would generate some noise from heating, ventilating, and air conditioning mechanical equipment. As discussed in Impact NOI-2, HVAC equipment would operate within the restrictions of the City's Noise Ordinance. Chapter 17.120.050 of the City of Oakland Planning Code specifies the maximum sound level received at residential, public open spaces and commercial land uses. This restriction can be used in combination with the predicted roadway noise levels presented in Table 4.10-8 to estimate a worst-case prediction of cumulative noise increase from both stationary and roadway noise sources. **Table 4.10-9** presents the cumulative noise increase at the existing sensitive receptor within 200 feet of the project site from both roadway and stationary sources. These noise levels reflect daytime Saturday conditions which are when peak traffic contributions would occur. Stationary source noise levels are considered in terms of the L_{33} (the noise levels exceeded 20 minutes of a one hour period) as this is the noise descriptor of the City's noise ordinance which best lends itself to addition to roadway noise estimates which are calculated in terms of a peak-hour hourly average. The roadway noise contribution is assumed to occur from the cumulative increase from the nearest arterial roadway analyzed in Table 4.10-8. This analysis uses the existing monitored noise level as a baseline for comparison, unlike the analysis in Table 4.10-8 which solely analyzes modeled traffic volumes, because this cumulative analysis considers multiple sources, not just vehicle traffic.

TABLE 4.10-9
PEAK-HOUR CUMULATIVE NOISE LEVELS AT SENSITIVE RECEPTORS IN THE PROJECT AREA

Location	(A) Monitored Noise Level (Leq, dBA)	(B) Stationary Source Restriction (L_{33}, dBA)	(C) Cumulative Roadway only Noise Level (Leq)	(D) (B+C) Resultant Cumulative Noise Level (Leq)	(D-A) Increase in Noise Level over Existing Monitored
Oakland Healthcare and Wellness Center	60.6	60	64.0	65.5	4.9

SOURCE: ESA, 2013.

As previously discussed, the Project and other cumulative development would incorporate NOI SCA 4, *Interior Noise*, and NOI SCA 5, *Operational Noise (General)*, that would limit operational noise impacts to less than significant.

A cumulative noise increase of less than 5 dBA over existing monitored conditions is predicted to occur at existing sensitive receptors on Webster Street, the Oakland Healthcare and Wellness Center residential health facility. This determination assumes stationary source operating at an adjacent property at the maximum property line limit allowed by the noise ordinance. As discussed in Impact NOI-6, cumulative traffic noise impacts, by themselves, would be significant (greater than 5 dBA), but the increase attributable to Project traffic would not exceed 3 dBA and therefore not be cumulatively considerable. When the contribution from maximum allowable stationary source noise is added to cumulative traffic, and the project's contribution from both stationary and mobile sources is compared to existing monitored noise levels, the cumulative increase would be 4.9 dBA and be considered a less-than-significant cumulative impact.

Mitigation: None required.

4.10.4 References

California Department of Transportation (Caltrans), 2004. *Transportation- and Construction-Induced Vibration Guidance Manual*, June 2004.

California Department of Transportation (Caltrans), 2009. *Technical Noise Supplement*, November 2009.

City of Oakland, 2005. *Noise Element, City of Oakland General Plan*, June 21, 2005.

City of Oakland, 2008. Planning Code Chapter 17.120.050.

City of Oakland, 2010. "CEQA Thresholds/Criteria of Significance Guidelines," 2010.

Federal Transit Administration (FTA), 2006. *Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)*, May 2006.

U.S. Environmental Protection Agency (USEPA), 1971. *Noise from Construction Equipment and Building Operations, Building Equipment and Home Appliances*, December 1971.

4.11 Public Services

This section describes existing public services in the project vicinity and analyzes how those resources may be affected by the Project. It also evaluates the potential effects of the Project on the delivery of public services, and possible adverse physical impacts on the environment that could result from a need to provide new or physically altered facilities. The analysis reviews police services and fire protection and emergency medical response.[1] Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary.

4.11.1 Environmental Setting

Police Services

The Oakland Police Department (OPD) is headquartered at 455 7th Street, approximately 1.5 miles from the project site (OPD, 2012a). The Police Department currently employs 615 sworn police officers, with a civilian staff of 288 full-time and 55 part-time employees (Bolton, 2013). The city is geographically divided into 57 community policing beats (OPD, 2012b).

The Project is located within police beat 08X. This beat comprises the area bounded by 40th Street and Interstate 580 (I-580) to the north, Grand Avenue to the south, Harrison Street/Orange Street to the east and Interstate 980 (I-980) to the west (OPD, 2012a).

OPD's response times to calls for police services are recorded for the City of Oakland as a whole; OPD does not track response times for individual service areas. Response times generally reflect the perceived seriousness of the call. OPD ranks incoming calls for police services as follows: Priority 1 means imminent danger of death or serious injury, felonies in progress, or serious public health hazards; Priority 2 refers to disputes with potential for violence, misdemeanor crimes in progress, stolen vehicle reports, and similar matters; and Priority 3 calls are reports of incidents that do not present danger to life or property.

OPD's last formal study analyzing response time goals and averages was conducted in 2010 and published in a Strategic Plan (OPD, 2010). The Strategic Plan reported that in 2009, OPD on average responded to Priority 1 calls in 14.8 minutes, 71 minutes for Priority 2 calls, and 148.3 minutes for Priority 3 calls. These response times did not meet Oakland's goals of 5 minutes for Priority 1 calls, between 10 and 15 minutes for Priority 2 calls, and 30 minutes for Priority 3 calls (OPD, 2010).

Fire Protection and Emergency Medical Services

The Oakland Fire Department (OFD) provides fire protection services and emergency medical services throughout the City. OFD operates 25 fire stations, including one at the Oakland

[1] Potential effects on public schools and parks usage are discussed in Section 4.14, *Other Less-than-Significant Effects,* of this Draft EIR.

International Airport. OFD maintains a fleet of 24 Engines, 7 Trucks, and numerous other special operations, support, and reserve units throughout three Battalions. Total Operations Division staffing consists of 500 uniformed personnel. The actual number of assigned personnel per station varies depending on the specific needs of that station. All personnel are trained as Paramedics or Emergency Medical Technicians (OFD, 2012a).

Station 15 at 455 27th Street is the nearest fire station to the project site, Station 15, is located approximately 600 feet west of Broadway. The next nearest other station in the vicinity is Station 5 at 934 34th Street (approximately one mile west of Broadway) (OFD, 2012b).

In addition to firefighting and emergency medical response capabilities, OFD also has a hazardous materials unit that operates from Station 3 at 1445 14th Street and responds citywide to emergencies involving hazardous materials (OFD, 2012a).

The Oakland Fire Department Dispatch Center (FDDC) is located in downtown Oakland and is responsible for fire and medical emergency coordination and response. The FDDC receives approximately 60,000 calls for response annually, of which approximately 80 percent are medical in nature (OFD, 2012a). In 2012, the Engine at Fire Station 15 responded to 3326 calls for service, and the Truck responded to 1356 calls. The City's response time goal for OFD is seven minutes or less, 90 percent of the time. In most cases, Station 15 responds to calls in less than five minutes (Hoffmann, 2013).

4.11.1 Regulatory Setting

Local Plans and Policies

City of Oakland General Plan

Oakland General Plan policies that pertain to the various public services and recreation and with potential relevance to the Project include the following:

Land Use and Transportation Element (LUTE)

- ***Policy N.12.1*****:** The development of public facilities and staffing of safety-related services, such as fire stations, should be sequenced and timed to provide a balance between land use and population growth, and public services at all times.

- ***Policy N.12.5:*** In its capital improvement and public service programs, the City should give priority to reducing deficiencies in, and disparities between, existing residential areas.

Safety Element

- ***Policy FI-1:*** Maintain and enhance the city's capacity for emergency response, fire prevention and fire fighting.

    Action FI-1.1: Periodically assess the need for new or relocated fire stations and other facilities, changes in staffing levels, and additional or updated supplies, equipment, technologies and in-service training classes.

Action FI-1.2: Strive to meet a goal of responding to fires and other emergencies within seven minutes of notification 90 percent of the time.

Action FI-1.5: Continue to participate not only in general mutual-aid agreements but also in agreements with adjoining jurisdictions for cooperative response to fires.

- ***Policy FI-2***: Continue, enhance or implement programs that seek to reduce the risk of structural fires.

  Action FI-2.1: Adopt and amend as needed updated versions of the California building and fire codes so that optimal fire-protection standards are used in construction and renovation projects.

  Action FI-2.2: Continue to enforce provisions under the local housing code requiring the use of fire-resistant construction and the provision of smoke detectors and fire-extinguishing systems.

  Action FI-2.3: Continue to review development proposals to ensure that they incorporate required and appropriate fire-mitigation measures, including adequate provisions for occupant evacuation and access by fire-fighting personnel And Equipment.

  Action FI-2.5: Continue to conduct periodic fire-safety inspections of commercial, multi-family and institutional buildings.

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

The City of Oakland's standard practice is to incorporate relevant SCAs as part of Project approvals. SCAs relevant to reducing impacts on public services due to the Project are listed below. If the Project is approved by the City, all applicable SCA would be adopted as conditions of approval and required. These SCAs would help ensure less-than-significant impacts to public services.

- **PSR SCA 1: Conformance with other Requirements**

  Prior to issuance of a demolition, grading, P-job, or other construction related permit:

  a. The project applicant shall comply with all other applicable federal, state, regional and/or local laws/codes, requirements, regulations, and guidelines, including but not limited to those imposed by the City's Building Services Division, the City's Fire Marshal, and the City's Public Works Agency. Compliance with other applicable requirements may require changes to the approved use and/or plans. These changes shall be processed in accordance with the procedures contained in SCA 3, *Scope of This Approval, Major and Minor Changes*.

  b. The applicant shall submit approved building plans for project-specific needs related to fire protection to the Fire Services Division for review and approval, including, but not limited to automatic extinguishing systems, water supply improvements and hydrants, fire department access, and vegetation management for preventing fires and soil erosion.

- **PSR SCA 2: Fire Safety Phasing Plan**

  Prior to issuance of a demolition, grading, and/or construction and concurrent with any p-job submittal permit:

  > The project applicant shall submit a separate fire safety phasing plan to the Planning and Zoning Division and Fire Services Division for their review and approval. The fire safety plan shall include all of the fire safety features incorporated into the project and the schedule for implementation of the features. Fire Services Division may require changes to the plan or may reject the plan if it does not adequately address fire hazards associated with the project as a whole or the individual phase.

- **PSR SCA 3: Fire Safety**

  Prior to and ongoing throughout demolition, grading, and/or construction:

  > The project applicant and construction contractor will ensure that during project construction, all construction vehicles and equipment will be fitted with spark arrestors to minimize accidental ignition of dry construction debris and surrounding dry vegetation.

4.11.2 Impacts and Mitigation Measures

Significance Criteria

The Project would have a significant impact on the environment if it were to:

1. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:
   - Fire protection;
   - Police protection;
   - Schools; or
   - Other public facilities.
2. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
3. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Approach to Analysis

The increases in population and land use intensity that would result from the Project were evaluated based on the web-based information regarding the various public services agencies with jurisdiction within the project vicinity and their service capabilities, service ratios, response times, and performance objectives for those services. Additionally, the Project was evaluated for conformity with the goals, objectives and policies of the General Plan related to public services.

The potential effects of the Project on public schools, recreation, and parks usage are discussed in Section 4.14, *Other Less-than-Significant Effects.*

Impacts

Police Services Impacts

Impact PSR-1: The Project could result in an increase in calls for police services, but would not require new or physically altered police facilities in order to maintain acceptable performance objectives (Criterion 1). (Less than Significant)

The Project would increase land use intensity and population, which could result in an increase in reported crimes. However, adherence to General Plan Policy N.12.1, described above, would reduce the potential for project-related service deficiencies. The Project would infill an undeveloped and underused property, helping to revitalize the corridors and community, and could result in a reduction in criminal activity within the project vicinity as a result of generating more population activity at the project site and surroundings most times of day. Overall, the Project would not result in an increased demand for police services such that new or physically altered police facilities would be required, the construction of which could have significant environmental effects. As such, the Project would have a less-than-significant impact on police services.

Mitigation: None required.

Fire Protection and Emergency Medical Services Impacts

Impact PSR-2: The Project could result in an increase in calls for fire protection and emergency medical response services, but would not require new or physically altered fire protection facilities in order to maintain acceptable performance objectives (Criterion 1). (Less than Significant)

The Project would result in an increase in demand for fire protection and emergency services given the increased population on the site at one time (approximately 800 visitors per day). However, adherence by the City to General Plan Policies N.12.1, N.12.5, FI-1, and FI-2, as well as PSR SCA 2, *Fire Safety Phasing Plan*, described above, would reduce the potential for service deficiencies and related impacts. OFD is currently able to meet or exceed their response time goal 90 percent of the time, and the Project would not impair that service performance. The Project would have a less-than-significant impact on fire protection and emergency medical response services.

Mitigation: None required.

Cumulative Impacts

Impact PSR-3: The Project, in combination with other past, present, existing, approved, pending, and reasonably foreseeable future projects within and around the project site, would not result in a cumulative increase in demand for police, fire, and school services. (Less than Significant)

Geographic Context

The cumulative geographic context for public services and recreation considerations for the Project consists of the project vicinity in addition to all areas of the city, as public services and recreation facilities are provided citywide.

Impacts

Cumulative development within the project vicinity, combined with cumulative development (as described in Chapter 4, Section 4.01, Cumulative Development, of this Draft EIR), would increase demand for police and fire protection services. These developments, however, would provide additional tax revenue and other development fees that would go toward paying for increased public services, pursuant to the General Plan and other regulatory requirements. Adherence to the General Plan policies listed under Impacts PSR-1 and PSR-2 (and collectively in the Regulatory Setting, which includes public services policies that may not apply to the Project but would apply to other cumulative development) would reduce the potential for significant impacts. Therefore, cumulative development, in combination with the Project, would result in a less-than-significant cumulative impact on police and fire services.

Mitigation: None required.

4.11.3 References

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4.12 Transportation and Circulation

This section describes the transportation, circulation, and parking conditions, including transit services and pedestrian and bicycle facilities in vicinity of the Project. This section also describes the regulatory setting relevant to transportation and circulation issues. Potential impacts of the Project are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary, followed by identification of the residual impact significance after mitigation measures are implemented.

Figure 4.12-1 illustrates the location of the Project and the local and regional street system. The analysis evaluates the traffic-related impacts of the Project during the weekday evening and Saturday peak hours. The analysis was conducted in compliance with City of Oakland and Alameda County Transportation Commission (ACTC) guidelines. Traffic conditions are assessed for the following four scenarios:

- ***Existing*** – Represents existing conditions with volumes obtained from recent traffic counts and the existing roadway system.
- ***Existing Plus Project*** – Existing conditions plus traffic generated by the Project.
- ***2035 No Project*** **–** Future conditions with planned population and employment growth, and planned transportation system improvements, for the year 2035. This scenario assumes no traffic growth at the project site. Traffic projections were developed using the ACTC Model.
- ***2035 Plus Project Buildout*** **–** Future forecasted conditions for the year 2035, as determined in the 2035 No Project scenario, plus traffic generated by the Project.

This EIR analyzes future impacts under 2035 conditions only because the Project would be constructed in one phase in the next few years, and no changes in the transportation infrastructure network in the project vicinity are expected between 2020 and 2035. Therefore, an analysis of 2020 conditions would not result in identification of additional impacts.[1]

4.12.1 Existing Setting

The existing transportation-related context in which the Project would be constructed is described below, beginning with a description of the study area and the street network that serves the project site. Existing transit service, bicycle and pedestrian facilities, in the vicinity of the Project are also described. Intersection levels of service are then defined and current conditions for roadways and intersections in the project vicinity are summarized. This subsection also discusses planned transportation improvements in the project vicinity as well as the applicable planning policies.

[1] Although the future intersection operations analysis is completed for 2035 conditions only, the Congestion Management Program (CMP) and Metropolitan Transportation System (MTS) analyses include both 2020 and 2035 conditions, per ACTC guidelines.

SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-1
Project Study Area

Study Area

Intersection operations at 13 intersections in the vicinity of the project site (listed below) were evaluated during the weekday evening (PM) and Saturday peak periods for Existing and 2035 conditions. These time periods were selected because traffic generated by the Project, in combination with background traffic, is expected to represent typical worst traffic conditions. (All study intersections are located within the Downtown area or provide direct access to Downtown, except one as noted by *).

1. 51st Street/Pleasant Valley Avenue/ Broadway
2. 40th Street/Broadway
3. West MacArthur Boulevard/Telegraph Avenue
4. MacArthur Boulevard/Broadway
5. MacArthur Boulevard/Piedmont Avenue*
6. Piedmont Avenue/Hawthorne Avenue/ Brook Street/Broadway
7. 30th Street/Broadway
8. 29th Street/Broadway
9. 27th Street/Telegraph Avenue
10. 27th Street/Broadway
11. 27th Street/24th Street/Bay Place/ Harrison Street
12. Grand Avenue/Broadway
13. 30th Street/Project Driveway*

In general, major intersections where the Project would increase traffic volumes by 50 or more peak-hour trips are identified as potential study intersections. This threshold is selected because it generally corresponds to five percent or more of current traffic volumes along major arterials, which is similar to the typical day-to-day fluctuation in traffic volumes and can be noticeable to most people. Figure 4.12-1 shows the 13 study intersections.

As discussed in detail on pages 4.12-28 to 4.12-29, the Project would consist of retail uses that generate fewer trips during the weekday AM peak hour than during the weekday PM or Saturday peak hours. In addition, most of the study intersections currently operate at better conditions during the AM peak hour than during the PM peak hour. As a result, evaluation of traffic operations during the weekday PM and Saturday peak hours is anticipated to capture impacts at the study intersections, and this analysis does not evaluate traffic operations during the weekday AM peak hour.

Existing Roadway Network

Regional vehicular access to the project site is provided by Interstate 580 (I-580), I-880, I-980, and State Route 24 (SR 24), while local access is provided via Broadway and Telegraph Avenue. These and other major roadways in the study area are described below.

- ***I-980*** is an eight-lane north-south freeway west of the project site that connects SR 24 and I-580 to I-880. I-980 has an average annual daily traffic volume (AADT) of 113,000 vehicles near the project site (Caltrans, 2012a). Ramps at 27th Street provide the nearest freeway access to the project site.

- ***SR 24*** is an eight-lane east-west freeway that is the continuation of I-980 east of I-580 and extends to Walnut Creek. SR 24 has an AADT of approximately 146,000 vehicles east of I-980 (Caltrans, 2012a).

- ***I-580*** is an eight-lane freeway between SR 101, in Marin County, and I-5 south of Tracy. I-580 is located just north of the project site and has an AADT of approximately 230,000 vehicles per day near SR 24/I-980 (Caltrans, 2012a). The Oakland Avenue / Harrison Street Interchange and Webster Street off-ramp provide the nearest access to the project site.

- ***I-880*** is an eight-lane north-south freeway between I-80 in Emeryville and I-280 in San Jose. I-880 has an AADT of approximately 199,000 vehicles south of Broadway (Caltrans, 2012a). Broadway and Jackson Street ramps provide the nearest access to the project site.

- ***Broadway*** is a major north-south arterial between Jack London Square and SR 24. Broadway borders the east side of the project site and provides four travel lanes in the project vicinity.

- ***Telegraph Avenue*** is a major north-south arterial extending from Broadway in Downtown Oakland to Berkeley. Telegraph Avenue generally provides two travel lanes in each direction in the study area.

- ***Harrison Street*** is an arterial extending from Downtown Oakland to east of I-580. In the vicinity of I-580, Harrison Street forms a one-way couplet with Oakland Avenue. Harrison Street generally provides three travel lanes in each direction.

- ***MacArthur Boulevard*** is a major east-west arterial north of the project site that extends from Hollis Street in West Oakland/Emeryville generally paralleling I-580 to San Leandro in the east and beyond. MacArthur Boulevard generally provides two travel lanes in each direction in the study area.

- ***27th Street/Bay Place*** is a generally four-lane, east-west arterial that extends from San Pablo Avenue to Grand Avenue.

- ***Grand Avenue/West Grand Avenue*** is a generally four-lane major arterial extending from West Oakland to Downtown Oakland and the City of Piedmont.

- ***Piedmont Avenue*** is a two-lane, minor north-south arterial extending from Broadway to 51st Street. Piedmont Avenue provides one lane in each direction.

- ***Webster Street*** is a north-south street extending from City of Alameda to 51st Street. Webster Street is discontinuous between 25th and 28th Streets. South of 25th Street, Webster Street is to the east of Broadway; north of 28th Street, Webster Street is to the west of Broadway. Webster Street provides one travel lane in each direction.

- ***29th Street*** is a two-lane east-west local street that extends between Harrison Street / Oakland Avenue and Martin Luther King Jr. Way in Oakland.

- ***30th Street*** is a two-lane east-west local street that extends between Richmond Boulevard and Peralta Street in Oakland and borders the south side of the project site.

Existing Transit Service

Transit service providers in the project vicinity include AC Transit, which provides local and Transbay bus service with connections to the Transbay Terminal in San Francisco; the Free B Shuttle, which provides free shuttle service along Broadway between Uptown and Jack London Square; and Bay Area Rapid Transit (BART), which provides regional rail service. The existing transit services provided near the project site are shown in **Figure 4.12-2** and described below.

SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-2

Existing Transit Service

AC Transit

AC Transit is the primary bus service provider in 13 cities and adjacent unincorporated areas in Alameda and Contra Costa Counties, with Transbay service to destinations in San Francisco, San Mateo and Santa Clara Counties. **Table 4.12-1** summarizes the characteristics of the AC Transit routes operating in the project area.

TABLE 4.12-1
AC TRANSIT ROUTES IN THE PROJECT VICINITY

Line	Route	Nearest Stops	Weekday		Weekend		Bus Type
			Hours	Headway[a]	Hours	Headway	
Local Routes							
1 (Telegraph)	Downtown Berkeley to the Bay Fair BART station	Telegraph Ave. at 30th St. and 31st St.	5:30 AM to 12:00 AM	15-20 minutes	5:00 AM to 1:00 AM	15-20 minutes	60-foot articulated buses with a 47-person seating capacity
1R (Telegraph/ International Boulevard Rapid)	Downtown Berkeley to the Bay Fair BART station (limited stops)	Telegraph Ave. at 30th St. and 31st St.	6:00 AM to 8:00 PM	12 minutes	7:30 AM to 7:00 PM	15 minutes	
11 (Harrison Street)	Piedmont to Dimond Business District	Harrison St./ Oakland Ave. at 29th St.	6:00 AM to 8:00 PM	30 minutes	7:00 AM to 8:30 PM	60 minutes	40-foot buses with a 32-person or 40-person seating capacity
51A	Rockridge BART station to Fruitvale BART station	Broadway at 29th St. and 30th St.	5:00 AM to 12:30 AM	10-20 minutes	5:30 AM to 12:30 AM	15-20 minutes	30-foot buses with a 32-person seating capacity
Night Routes							
800 (All-Nighter)	Downtown San Francisco to the Richmond BART station	Telegraph Ave. at 30th St. and 31st St.	12:20 AM to 6:20 AM	60 minutes	11:50 PM to 7:30 AM	60 minutes	40-foot buses with a 32-person or 40-person seating capacity
851 (All-Nighter)	Fruitvale BART station to downtown Berkeley	Broadway at 29th St. and 30th St.	12:20 AM to 5:00 AM	60 minutes	12:20 AM to 5:00 AM	60 minutes	40-foot buses with a 32-person or 40-person seating capacity

[a] The frequency, or interval of time between buses traveling in any given direction along a designated route.

SOURCE: AC Transit, 2013.

Table 4.12-2 describes the bus stops near the project site. The nearest bus stops are adjacent to the project site along southbound Broadway just north of 30th Street and about 400 feet south of the project site along northbound Broadway just north of 29th Street.

TABLE 4.12-2
AC TRANSIT BUS STOPS IN THE PROJECT VICINITY

Street	Direction	Location	Bus Routes	Bus Stop Amenities	Nearest Pedestrian Crossing
Broadway	NB	After intersection with 29th Street	51A, 851	Bus stop sign, bench, trash receptacle	Signalized 29th Street/ Broadway intersection
	SB	Before intersection with 30th Street	51A, 851	Bus stop sign, bench, trash receptacle	Signalized 30th Street/ Broadway intersection
Telegraph Avenue	NB	After intersection with 31st Street	1/1R, 800	Bus stop sign, bench, shelter, trash receptacle	Unsignalized eastbound 31st Street/Telegraph Avenue intersection which provides unmarked crosswalks across Telegraph Avenue
	SB	After intersection with westbound 30th Street	1/1R, 800	Bus stop sign, bench, shelter, trash receptacle	Signalized westbound 30th Street/ Telegraph Avenue intersection

SOURCE: Fehr & Peers, 2013.

Table 4.12-3 shows the capacity and loads (passengers) of the AC Transit routes serving the project area and vicinity. Average and maximum load factors are also shown. Load factor is defined as the ratio of occupied seats to the number of seats on the bus. A load factor of 100 percent or more indicates that the bus operates at or above its seated capacity. Although the average load factors are well below bus capacities, the maximum load factors for most of the routes serving the project site are above capacity during peak periods.

Bay Area Rapid Transit

BART provides regional rail service throughout the East Bay and across the Bay to San Francisco and the Peninsula. The nearest BART stations to the project site are the 19th Street station, about 0.8 miles south of the project site and the MacArthur Station, about one mile northwest of the site. Both stations are served by the Richmond-Fremont, Richmond-Millbrae and Pittsburg/ Bay Point-San Francisco International Airport lines. Each station is served by about 32 trains per hour during the peak periods. Currently, the majority of BART lines passing through both stations during peak periods operate above their total capacity when accounting for both seated and standing room. Based on October 2012 data, on a typical weekday, about 24,000 riders access the 19th Street Station, and about 19,000 riders access the MacArthur BART Station (BART, 2012).

Shuttle Service

The Oakland Free Broadway shuttle ("Free B") operates along Broadway between Jack London Square and Grand Avenue on weekdays and between Jack London Square and 27th Street on weekend nights. The free shuttle service is about a quarter-mile south of the project site and connects the project site to Downtown Oakland, Jack London Square, and 12th and 19th Street BART Stations. About 2,000 riders use the "Free B" on typical weekdays (City of Oakland, 2011).

TABLE 4.12-3
AC TRANSIT BOARDINGS AND ALIGHTINGS (Weekday)

Bus Route and Stop Location	Direction	Average Capacity (Seats)	Average Load [a] (Passengers)	Average Load Factor[b]	Maximum Load[c] (Passengers)	Maximum Load Factor[d]	Boardings (Ons)[e]	Alightings (Offs)[f]
Route 1 on Telegraph Avenue at 29th/30th St.	Southbound	47	19.8	42%	44	94%	101	37
	Northbound		22.9	49%	50	106%	22	62
Route 1 on Telegraph Avenue at 31st/32nd St.	Southbound	47	18.8	40%	42	89%	12	15
	Northbound		23.6	50%	54	115%	29	39
Route 1R on Telegraph Avenue at 30th/31st St.	Southbound	47	21.9	47%	44	94%	176	81
	Northbound		23.8	51%	59	126%	105	160
Route 11 on Harrison Street at 29th Street	Eastbound	40	11.0	28%	23	58%	12	0
	Westbound		10.8	27%	20	50%	0	4
Route 51A on Broadway at 29th/30th Street	Southbound	32	12.3	38%	34	106%	76	47
	Northbound		15.5	48%	53	166%	67	158
Route 51A on Broadway at Piedmont Avenue	Southbound	32	12.0	38%	35	109%	71	21
	Northbound		14.8	46%	53	166%	20	93

[a] Number of passengers on the bus averaged on a typical weekday.
[b] Average load divided by average seated capacity.
[c] Maximum number of passengers on the bus observed on a typical weekday.
[d] Maximum load divided by average seated capacity.
[e] Total number of passengers boarding the bus at this location on a typical weekday.
[f] Total number of passengers alighting the bus at this location on a typical weekday.
[g] Bus stop moved to 25th Street/Webster Street after ridership data was provided.

Bold indicates load factor above 100 percent.

SOURCE: Data collected in March 2012 through June 2012 and provided by AC Transit in August 2012.

Existing Bicycle Network

Bicycle and pedestrian facilities can be classified into several types, including:

- ***Class 1 Paths.*** These facilities are located off-street and can serve both bicyclists and pedestrians. Recreational trails can be considered Class 1 facilities. Class 1 paths are typically 8 to 10 feet wide excluding shoulders and are generally paved.

- ***Class 2 Bicycle Lanes.*** These facilities provide a dedicated area for bicyclists within the paved street width through the use of striping and appropriate signage. These facilities are typically 5 to 6 feet wide.

- ***Class 3 Bicycle Routes.*** These facilities are found along streets that do not provide sufficient width for dedicated bicycle lanes. The street is then designated as a bicycle route through the use of signage informing drivers to expect bicyclists.

  – *Class 3A Arterial Bicycle Routes* – These facilities are found along some arterial streets where bicycle lanes are not feasible and parallel streets do not provide adequate connectivity. Speed limits as low as 25 miles per hour (mph), and shared-lane bicycle stencils, wide curb lanes, and signage are used to encourage shared use.

– *Class 3B Bicycle Boulevards* – These facilities are found along residential streets with low traffic volumes. Assignment of right-of-way to the route, traffic calming measures and bicycle traffic signal actuation are used to prioritize through-trips for bicycles.

Based on the City of Oakland's 2007 *Bicycle Master Plan Update*, **Figure 4.12-3** shows the existing and planned bicycle facilities in the project vicinity. Broadway provides a Class 2 bicycle lane on both sides of the street adjacent to the project site. Other existing bicycle facilities near the project site include Class 3A arterial bike routes on Webster Street (with Class 2 bike lanes on northbound Webster Street between 30th Street and Hawthorne Avenue) and Class 2 bicycle lanes on 27th Street.

Major proposed bicycle facilities in the project vicinity include Class 2 bicycle lanes on Telegraph and Piedmont Avenues, and on Broadway north of I-580, and a combination of Class 2 bicycle lanes and Class 3A arterial bicycle route on Harrison Street.

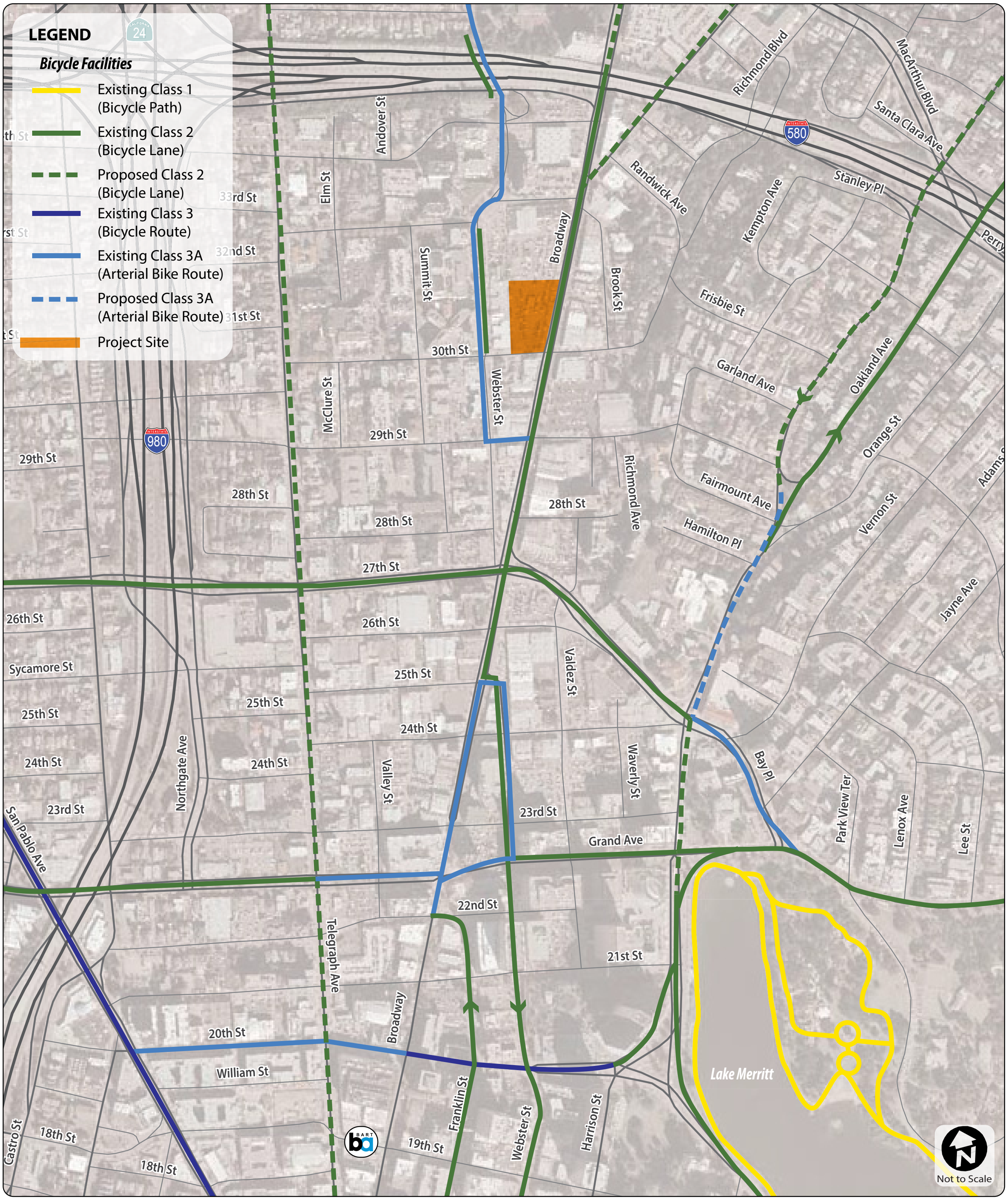
Existing Pedestrian Network

The City of Oakland's *Pedestrian Master Plan* (*PMP*, November 2002) designates Broadway and Telegraph Avenue as City Routes, 27th Street as a District Route, and Webster and 29th Streets as Neighborhood Routes. The *PMP* (page 48) states the following about these types of routes:

> "City routes designate streets that are destinations in themselves – places to live, work, shop, socialize and travel. They provide the most direct connections between walking and transit and connect multiple districts in the City."
>
> "District routes have a more local function as the location of schools, community centers, and smaller scale shopping. They are often located within a single district and help to define the character of that district."
>
> "Neighborhood routes are local streets that connect schools, parks, recreational centers, and libraries. They are places for people to meet and they provide the basis for neighborhood life. They are used for walking to school, walking for exercise, and safe walking at night."

Pedestrian facilities include sidewalks, crosswalks, and pedestrian signals. Sidewalks are provided on both sides of all existing streets in the study area, and vary in width from 5 to 15 feet. Sidewalks adjacent to the Project are described below:

- Broadway provides a 10-foot wide sidewalk along the east side of the project site. This sidewalk includes a minimum six-foot pedestrian through passage zone and a four-foot utility zone which accommodates trees, parking meters, signs, and light poles that provide lighting for both the sidewalk and the roadway. The sidewalk width on Broadway does not meet the minimum width for City routes recommended in the *PMP*, which consists of 12-foot-wide sidewalk with eight-foot minimum pedestrian passage zone.
- 30th Street provides a 10-foot sidewalk along the south side of the project site. This sidewalk includes a minimum seven-foot pedestrian through passage zone and a three-foot utility zone which accommodates trees, parking meters, signs, utility poles and light poles. The width for pedestrian through passage zone on 30th Street exceeds the minimum width for Neighborhood routes recommended in the *PMP.* About four feet of the sidewalk surface adjacent to the project site is paved with asphalt while the portion of the sidewalk adjacent to the street is paved with concrete.



SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-3
Existing and Proposed Bicycle Facilities

The signalized 30th Street/Broadway intersection, adjacent to the project site, provides striped crosswalks on all approaches of the intersection. The signalized intersection also provides audible signals, but does not provide pedestrian signal heads on any of the intersection approaches. The intersection provides one curb ramp for each intersection corner with only the southwest corner curb ramp providing a tactile surface with truncated domes.

About 100 feet west of the project site, the signalized 30th Street/Webster Street intersection provides striped crosswalks with pedestrian signal heads and audible signals on all intersection approaches. The intersection provides one curb ramp for each intersection corner and no tactile surfaces.

Just northwest of the project site, a midblock high visibility uncontrolled crosswalk (i.e., “ladder crossing”) is provided across Broadway. The crossing provides a center median and advance yield lines in both directions of Broadway.

Existing Traffic Conditions

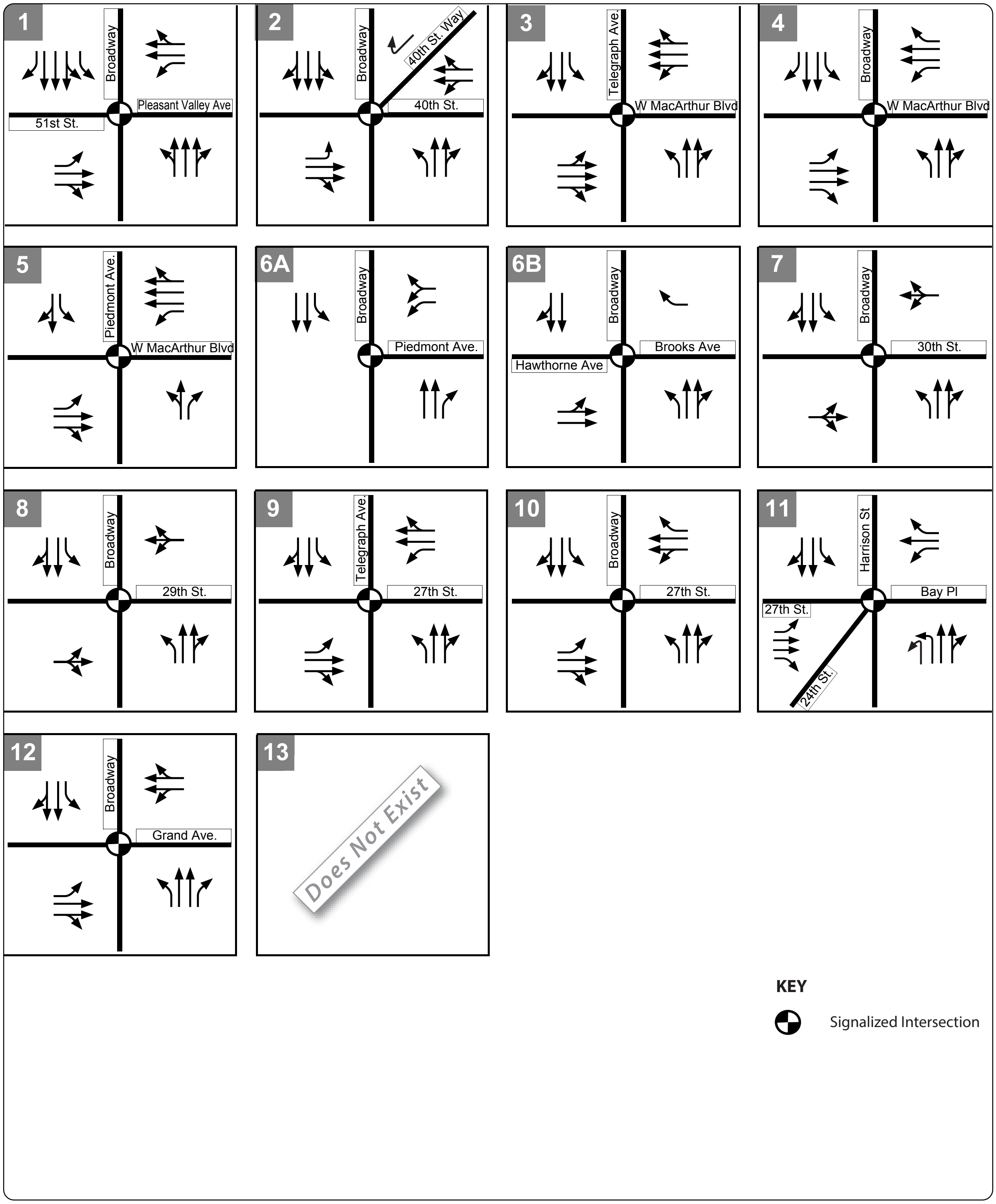
New traffic data was collected in June 2012 at three major intersections in the project vicinity and compared to data collected previously. Compared to traffic volume data collected for separate projects in 2007/2008, the new 2012 volumes were generally lower (see **Appendix G, part B.1,** for more detail). Therefore, this analysis uses the previously-collected intersection traffic counts where available because it would yield more conservative results.

Weekday evening (4:00 to 6:00 PM) peak period intersection traffic counts (vehicle turning movements, as well as pedestrian and bicycle volumes) were conducted at the study intersections in November 2008, March 2009, and May 2010 on sunny days while area schools were in normal session (Table 4.12-5, under Existing Intersection Operations, below, indicates the data collection date for all study intersections, and **Appendix G, part B.2,** presents the traffic counts at the study intersections). Saturday peak period (12:00 PM to 4:00 PM) traffic counts were conducted in October and November 2012. For each intersection, the single hour with the highest traffic volumes during each of the two count periods was identified as the “peak hour” and used as the basis for the intersection operational analysis.

Figure 4.12-4 presents the existing intersection lane configurations and traffic control devices; **Figure 4.12-5** presents the PM and Saturday peak-hour volumes; and **Figure 4.12-6** presents the existing pedestrian and bicycle volumes for all study intersections. Traffic signal timing data for all of the signalized study intersections was obtained from the City of Oakland Transportation Services Division.

Analysis Methods

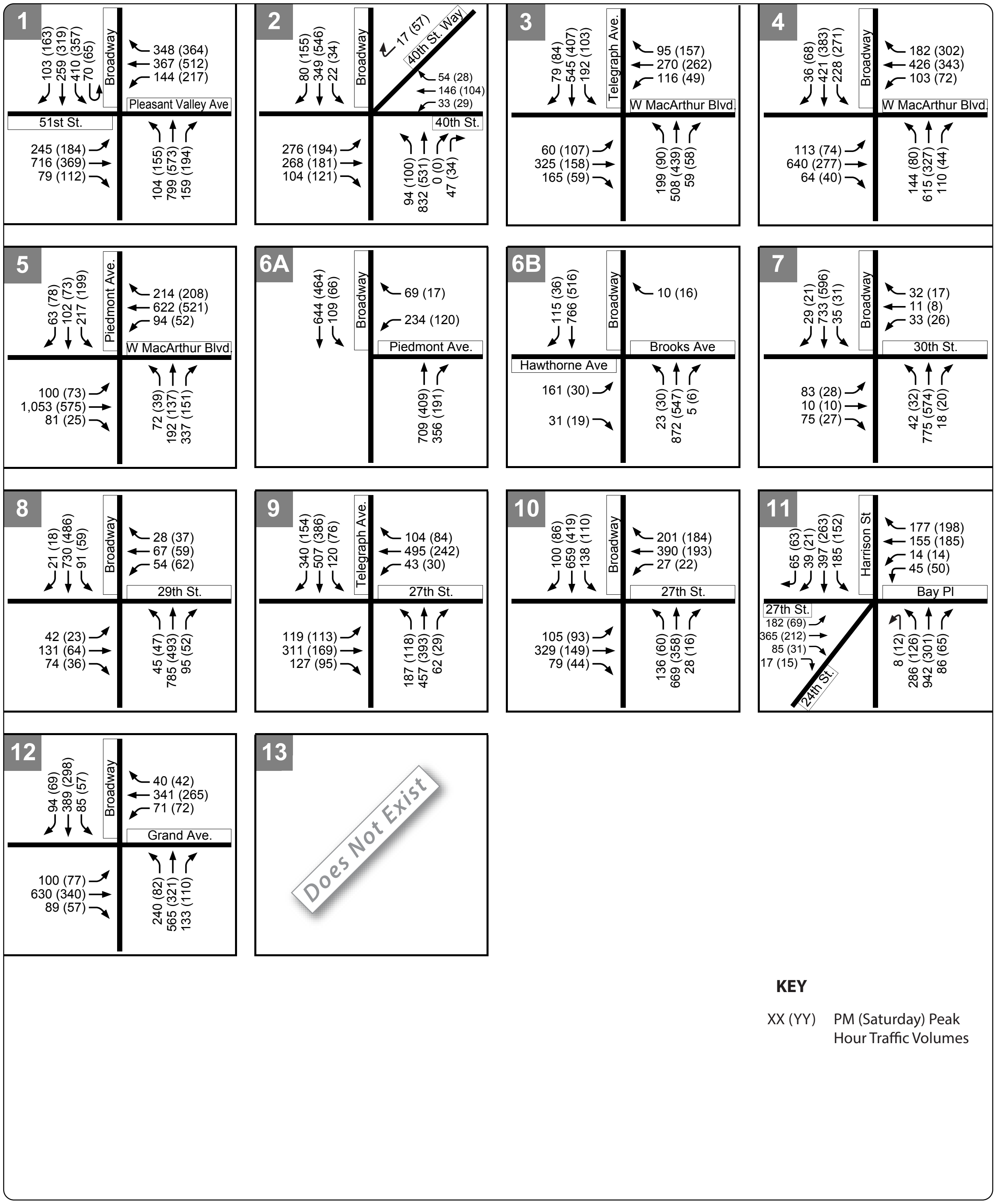
Intersection operations are described using the term “Level of Service” (LOS). Level of Service is a qualitative description of traffic operations from the vehicle driver perspective and consists of the delay experienced by the driver at the intersection. It ranges from LOS A, with no congestion



SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

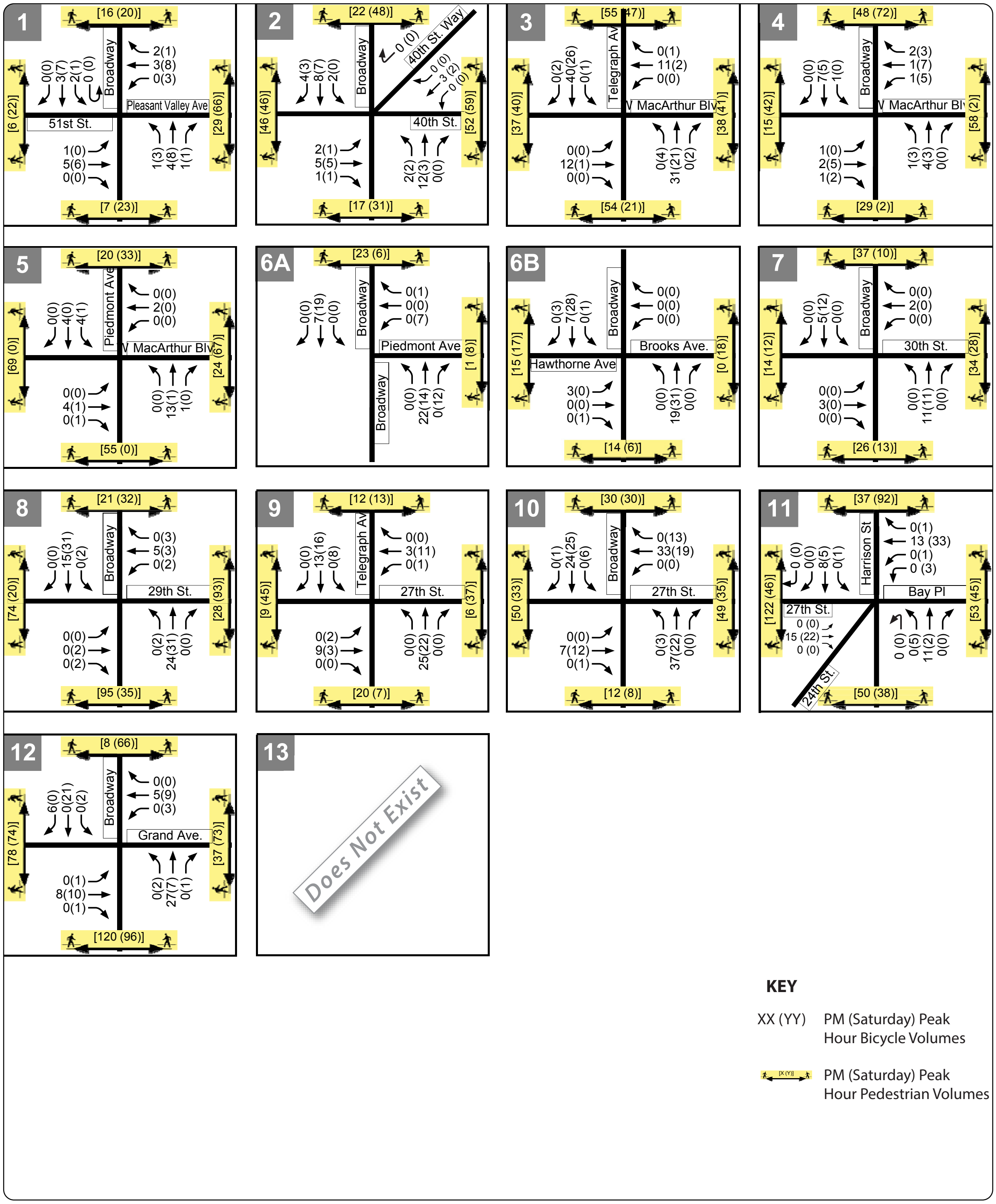
Figure 4.12-4
Existing Conditions
Intersection Configuration and Traffic Control



SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-5
Existing Conditions
PM and Saturday Peak Hour Intersection Configuration



SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-6
Existing Conditions
PM and Saturday Peak Hour Bicycle and Pedestrian Volumes

and little delay, to LOS F, with excessive congestion and delays. Different methods are used to assess signalized and unsignalized (stop-controlled) intersections.

Signalized Intersections

Signalized intersection operations are evaluated using methods provided in the 2000 *Highway Capacity Manual* (HCM) and the Synchro traffic analysis software program. These methods evaluate average control delays and then assign an LOS. Control delay is defined as the delay associated with deceleration, stopping, moving up in the queue, and acceleration experienced by drivers at an intersection. **Table 4.12-4**, below, provides a description of various LOS and the corresponding ranges of delays for signalized intersections.

TABLE 4.12-4
DEFINITIONS FOR INTERSECTION LEVEL OF SERVICE

Unsignalized Intersections		Level of Service Grade	Signalized Intersections	
Description	**Average Total Vehicle Delay (Seconds)**		**Average Control Vehicle Delay (Seconds)**	**Description**
No delay for stop-controlled approaches.	≤10.0	A	≤10.0	Free Flow or Insignificant Delays: Operations with very low delay, when signal progression is extremely favorable and most vehicles arrive during the green light phase. Most vehicles do not stop at all.
Operations with minor delay.	>10.0 and ≤15.0	B	>10.0 and ≤20.0	Stable Operation or Minimal Delays: Generally occurs with good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average delay. An occasional approach phase is fully utilized.
Operations with moderate delays.	>15.0 and ≤25.0	C	>20.0 and ≤35.0	Stable Operation or Acceptable Delays: Higher delays resulting from fair signal progression and/or longer cycle lengths. Drivers begin having to wait through more than one red light. Most drivers feel somewhat restricted.
Operations with increasingly unacceptable delays.	>25.0 and ≤35.0	D	>35.0 and ≤55.0	Approaching Unstable or Tolerable Delays: Influence of congestion becomes more noticeable. Longer delays result from unfavorable signal progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop. Drivers may have to wait through more than one red light. Queues may develop, but dissipate rapidly, without excessive delays.
Operations with high delays, and long queues.	>35.0 and ≤50.0	E	>55.0 and ≤80.0	Unstable Operation or Significant Delays: Considered to be the limit of acceptable delay. High delays indicate poor signal progression, long cycle lengths and high volume to capacity ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
Operations with extreme congestion, and with very high delays and long queues unacceptable to most drivers.	>50.0	F	>80.0	Forced Flow or Excessive Delays: Occurs with oversaturation when flows exceed the intersection capacity. Represents jammed conditions. Many cycle failures. Queues may block upstream intersections.

SOURCE: Transportation Research Board, Special Report 209, *Highway Capacity Manual*, 2000.

Unsignalized Intersections

Unsignalized intersection LOS is also analyzed using the 2000 HCM and Synchro software. Delay is calculated for movements that are controlled by a stop sign or that must yield the right-of-way. The movement or approach with the highest delay is reported. The LOS ranges for unsignalized intersections are shown in Table 4.12-4. They are lower than the delay ranges for signalized intersections because drivers will tolerate more delay at signals.

Existing Intersection Operations

Existing operations were evaluated for the weekday PM and Saturday peak hours at the study intersections. The existing vehicle, bicycle, and pedestrian volumes were used with the existing lane configurations and signal timing parameters as inputs into the LOS calculations to evaluate current operations. **Table 4.12-5** summarizes the intersection analysis results. **Appendix G, part B.3,** provides the detailed intersection LOS calculation worksheets, which are available for review at the City of Oakland.

All study intersections currently operate at acceptable LOS. All study intersections operate at LOS D or better during both weekday PM and Saturday peak hours, except the 27th Street/24th Street/Bay Place/Harrison Street intersection (#11), which operates at LOS E during the weekday PM peak hour.

ACTC Analysis of Existing Conditions

The ACTC conducts periodic monitoring of the freeways and major roadways in Alameda County. The most recent *Level of Service Monitoring on the Congestion Management Program Roadway Network* was released in January 2013. The ACTC monitoring report assesses existing freeway operations through “floating car” travel time surveys, which are conducted on all freeway segments during the evening peak hours (4:00 PM to 6:00 PM), and on selected freeway segments during the morning peak hours (7:00 AM to 9:00 AM). Based on the results of these surveys, ACTC assigns a LOS grade to each segment according to the method described in the 1985 HCM. Any segment with an average speed less than 30 miles per hour is assigned LOS F. Freeway interchanges with speeds below 50 percent of free flow speed are assigned LOS F. The travel time surveys concluded that 27 freeway segments, 11 arterial segments and one freeway-to-freeway connector within Alameda County operate at LOS F during the PM peak hours, including the following in the project vicinity:

- I-80 eastbound: Toll Plaza to I-580
- I-580 eastbound: I-80 to I-980 (grandfathered segment)
- I-580 westbound: SR 24 to I-880
- I-880 northbound: between I-80 Ramps
- SR 13 northbound: Moraga Avenue to Hiller Drive
- SR 13 southbound: Redwood Road to I-580
- SR 24 eastbound: I-580 to Broadway/SR 13 (grandfathered segment)
- SR 24 eastbound: Broadway/SR 13 to Caldecott Tunnel (grandfathered segment)
- SR 13/SR 24 Interchange

TABLE 4.12-5
EXISTING INTERSECTION LOS SUMMARY

	Intersection	Traffic Control[a]	Peak Hour	Count Date	Delay[b] (seconds)	LOS
1	51st Street/Pleasant Valley Avenue/ Broadway	Signal	PM	May 12, 2010	49.6	D
			SAT	Oct. 27, 2012	47.3	D
2	40th Street/ Broadway	Signal	PM	Nov. 11, 2008	22.9	C
			SAT	Oct. 27, 2012	14.1	B
3	West MacArthur Boulevard/ Telegraph Avenue	Signal	PM	Nov. 11, 2008	12.5	B
			SAT	Nov. 10, 2012	12.8	B
4	MacArthur Boulevard/ Broadway	Signal	PM	Nov. 11, 2008	38.8	D
			SAT	Oct. 27, 2012	44.0	D
5*	MacArthur Boulevard/ Piedmont Avenue	Signal	PM	Nov. 11, 2008	37.4	D
			SAT	Dec. 1, 2012	28.2	C
6	Piedmont Avenue/Hawthorne Avenue/Brook Street/ Broadway [c]	Signal	PM	Mar. 19, 2009	16.9	B
			SAT	Nov. 10, 2012	16.3	B
7	30th Street/ Broadway	Signal	PM	Mar. 19, 2009	13.1	B
			SAT	Dec. 1, 2012	7.9	A
8	29th Street/ Broadway	Signal	PM	Mar. 19, 2009	13.3	B
			SAT	Nov. 10, 2012	12.1	B
9	27th Street/ Telegraph Avenue	Signal	PM	Nov. 6, 2008	22.9	C
			SAT	Nov. 10, 2012	16.7	B
10	27th Street/ Broadway	Signal	PM	Mar. 19, 2009	18.5	B
			SAT	Nov. 10, 2012	17.6	B
11	27th Street/24th Street/ Bay Place/Harrison Street	Signal	PM	Nov.20, 2008	60.3	E
			SAT	Nov. 10, 2012	52.8	D
12	Grand Avenue/ Broadway	Signal	PM	Nov. 6, 2008	18.5	B
			SAT	Nov. 10, 2012	13.4	B
13*	30th Street/ Project Driveway	SSSC	PM	Intersection does not currently exist.		
			SAT			

a Signal = intersection is controlled by a traffic signal; SSSC = Intersection is controlled by a stop-sign on the side-street approach;
b For signalized intersections, average intersection delay and LOS based on the 2000 HCM method is shown. For side-street stop-controlled intersections, delays for worst movement and average intersection delay are shown: intersection average (worst movement)
c Piedmont Avenue/Broadway and Hawthorne Avenue/Brook Street/Broadway intersections are analyzed as one intersection because both intersections are controlled by one signal controller.
* Denotes an intersection not located in Downtown or on an arterial providing access to Downtown where LOS D is the LOS standard. All other intersections are located in Downtown or on an arterial providing access to Downtown where LOS E is the LOS standard.

SOURCE: Fehr & Peers, 2013.

Three of these segments operated at LOS F during the initial ACTC data collection effort in 1991, and are therefore “grandfathered,” meaning that they are exempt from LOS standards. The other segments are not exempt meaning that it operates at unacceptable conditions based on ACTC standards. The evaluation of the Project impacts on the ACTC freeway and roadway segments are presented in subsequent sections.

Planned Transportation Network Changes

A review of the available information indicates that several changes are planned for the various transportation modes in the study area, as described below. However, not all of these changes have finalized design plans, full approvals, and/or full funding. Changes lacking final design, full approval, and/or full funding are not considered reasonably foreseeable, are not available to mitigate any deficient conditions in the No Project conditions, and therefore are not assumed in the analysis.

Planned Roadway Changes

The planned roadway changes identified in the study area include:

- As part of the mitigation measures recommended in the *Kaiser Oakland Medical Center Master Plan Draft EIR* (February 2006), the following improvements are currently fully funded, under design and expected to be implemented in 2014; therefore, they are assumed in the 2035 analyses:
  - West MacArthur Boulevard/Broadway intersection (#4):
    - Modify westbound approach from the current configuration which provides one right-turn lane, two through lanes, and one left-turn lane to provide one shared through/right lane, two through lanes, and one left-turn lane.
    - Modify northbound approach from the current configuration which provides one shared through/right lane, one through lane, and one left-turn lane to provide one right-turn lane, two through lanes, and one left-turn lane.
    - Optimize signal timing at this intersection, and coordinate signal timing changes with the adjacent intersections that are in the same signal coordination group.
  - MacArthur Boulevard/Piedmont Avenue intersection (#5):
    - Provide an additional through lane on the eastbound MacArthur Boulevard approach (temporary closed for construction).
    - Modify northbound approach from the current configuration which provides one right-turn lane and one shared through/left lane to provide one right-turn lane, one through lane, and one left-turn lane.
    - Upgrade intersection signal equipment, optimize signal timing at this intersection, and coordinate signal timing changes with the adjacent intersections that are in the same signal coordination group.

The following planned major improvements do not have finalized design plans, approvals, and/or full funding; thus, this EIR does not include these roadway changes as part of the analysis:

- The proposed Safeway Redevelopment Project Broadway at Pleasant Valley Avenue (Draft EIR published in January 2013) proposes the following modifications at the Broadway/ 51st Street/Pleasant Valley Avenue intersection (#1)
  - Modify southbound approach to provide two left-turn lanes, one through lane, and one shared through/right lane.

- Modify northbound approach to provide one left-turn lane, one through lane, and one shared through/right lane.
- Upgrade signal equipment to replace the existing split phasing in the north/south direction with protected left turns.
- Eliminate the existing northbound and southbound slip right-turn lanes and "pork chop" islands.

The Safeway Redevelopment Project has not been approved. Because there is no guarantee that these improvements would occur, this EIR does not assume these improvements in the 2035 analyses.

- The City of Oakland finalized the Harrison Street/Oakland Avenue Community-Based Transportation Plan (CBTP) in 2010. The Plan recommended improvements on the Harrison Street/Oakland Avenue couplet between Grand Avenue and Monte Vista Avenue to improve access for all modes. The recommended improvements include the following at the 27th Street/24th Street/Bay Place/Harrison Street intersection (#11):

  - Partial closure of the 24th Street approach to allow only right-turning traffic from southbound 27th Street to enter.
  - Removal of the existing "pork chop" island and the slip right-turn lane from southbound Harrison Street to 27th Street
  - Realignment of pedestrian crosswalks and shortening of pedestrian walking distances, which allows more efficient operations of the traffic signal at the intersection.

  The recommendations in the Harrison Street/Oakland Avenue CBTP do not have funding, nor have they been approved; therefore, this EIR does not assume these improvements in the 2035 analyses.

Planned Transit Changes

AC Transit is currently planning the Route 51 Transit Performance Initiative, which will consist of improvements along Broadway to increase bus travel speeds. These improvements may include traffic signal coordination, transit priority at traffic signals, relocation of bus stops, providing bus bulbouts, left or right turn lanes, and/or queue jump lanes. The project has full funding and is expected to be completed in 2014. However, the specific improvements and the exact locations are not known at this time; nor has the project been approved. Therefore, these improvements are not included in the analysis of future conditions.

In 2012, AC Transit certified the Environmental Impact Statement/Environmental Impact Report for the implementation of Bus Rapid Transit (BRT) on Telegraph Avenue and International Boulevard connecting Berkeley, Oakland, and San Leandro. The proposed system would have dedicated one travel lane in each direction to bus operations only, allowing buses to provide a quicker and more reliable service than regular bus service today. AC Transit is proceeding with the segment between Downtown Oakland and San Leandro. Currently, there are no plans to implement BRT along Telegraph Avenue. Because the segment of BRT that would be implemented would not affect the study intersections, this EIR assumes that the BRT Project will not be provided in the study area.

The City of Oakland is currently investigating options for enhancing transit service along the Broadway corridor. One option under consideration is a streetcar operating on fixed rail in a shared lane with automobiles, buses and bicycles. The Broadway cross-section adjacent to the project site may need to be modified to accommodate streetcar tracks as part of a "complete street". This project is currently in early planning stages. It has not been approved and does not have full funding. In addition, the specific street modifications are not known at this time. Therefore, this EIR assumes that this project would not be implemented in the study area.

Planned Bicycle/Pedestrian Changes

Planned bicycle facilities in the study area include:

- City of Oakland is currently designing Class 2 bicycle lanes on Broadway between 38th Street and SR 24. The project would accommodate the bicycle lanes by generally eliminating one travel lane in each direction of Broadway. The project is funded, the segment between 38th Street and Broadway Terrace has been approved, and it is expected to be implemented in 2013. Therefore, the improvement is assumed in the 2035 analyses. The proposed improvement would result in the following street modification at the study intersections:
    - 40th Street/Broadway intersection (#2) - Eliminate one through lane on the southbound Broadway approach.
- City of Oakland has completed the design for Class 2 bicycle lanes on Piedmont Avenue between Broadway and Pleasant Valley Avenue. This improvement is approved, fully funded, and scheduled to be completed in 2013. Therefore, it is assumed in the 2035 analysis. However, this project would not modify the existing travel lane configurations or controls at any of the study intersections; it would not affect the intersection operations analysis.

The City of Oakland *Bicycle Master Plan Update*, as adopted in December 2007, proposes the following improvements to the bicycle facilities in the project vicinity:

- Provide Class 2 bicycle lanes along Telegraph Avenue. Telegraph Avenue (between Aileen and 20th Streets) is provisionally designated as part of the proposed bikeway network. The provisional designation will only be lifted, and this segment automatically incorporated into the proposed bikeway network, if further environmental review is performed, and appropriate CEQA findings are adopted by the City.
- Provide a combination of Class 2 bicycle lanes and Class 3A arterial bike routes along Harrison Street.

Because these improvements are not currently planned for implementation, do not have finalized design plans, and are not fully funded; this EIR assumes that these changes will not be provided in the study area.

Local Plans and Policies

The Oakland General Plan comprises numerous elements, and those containing policies relevant to transportation resources primarily are contained in the *Land Use and Transportation Element* (LUTE). The goals and policies contained in the various General Plan Elements are often competing. In reviewing a project for conformity with the General Plan, the City is required to 'balance' the competing goals and policies. The Project is reviewed for compliance with the following local plans and policies.

- General Plan LUTE
- City of Oakland Pedestrian Master Plan
- City of Oakland Bicycle Master Plan
- City of Oakland Public Transit and Alternative Modes Policy
- City of Oakland Complete Streets Policy
- City of Oakland Standard Conditions of Approval

City of Oakland General Plan LUTE

The City of Oakland, through various policy documents, states a strong preference for encouraging use of non-automobile transportation modes. The following polices are included in the LUTE:

- **LUTE Policy Framework: Encouraging Alternative Means of Transportation.** "A key challenge for Oakland is to encourage commuters to carpool or use alternative modes of transportation, including bicycling or walking. The Policy Framework proposes that congestion be lessened by promoting alternative means of transportation, such as transit, biking, and walking, providing facilities that support alternative modes, and implementing street improvements. The City will continue to work closely with local and regional transit providers to increase accessibility to transit and improve intermodal transportation connections and facilities. Additionally, policies support the introduction of light rail and trolley buses along appropriate arterials in heavily traveled corridors, and expanded use of ferries in the bay and estuary."

  Policy T3.5, Including Bikeways and Pedestrian Walks. The City should include bikeways and pedestrian walks in the planning of new, reconstructed, or realized streets, wherever possible.

  Policy T3.6, Encouraging Transit. The City should encourage and promote use of public transit in Oakland by expediting the movement of and access to transit vehicles on designated "transit streets" as shown on the Transportation Plan. (Policies T3.6 and T3.7 are based on the City Council's passage of "Transit First" policy in October 1996.)

  Policy T3.7, Resolving Transportation Conflicts. The City, in constructing and maintaining its transportation infrastructure, should resolve any conflicts between public transit and single occupant vehicles in favor of the transportation mode that has the potential to provide the greatest mobility and access for people, rather than vehicles, giving due consideration to the environmental, public safety, economic development, health and social equity impacts.

  Policy T4.1, Incorporating Design Features for Alternative Travel. The City will require new development, rebuilding, or retrofit to incorporate design features in their projects that encourage use of alternative modes of transportation such as transit, bicycling, and walking.

City of Oakland Pedestrian Master Plan

In November 2002, the *Pedestrian Master Plan* (PMP) was adopted by the City Council and incorporated into the adopted General Plan. The PMP identifies policies and implementation measures that promote a walkable City. In the study area, the PMP designates a Pedestrian Route Network throughout Oakland and identifies a "City Route" on Broadway, and Telegraph Avenue, a "District Route" on 27th Street, and a "Neighborhood Route" on Webster and 29th Streets.

The *PMP* includes the following relevant policies and actions:

- ***Policy 1.1. Crossing Safety*****:** Improve pedestrian crossings in area of high pedestrian activity where safety is an issue.

    Action 1.1.1. Consider the full range of design elements – including bulbouts and refuge islands – to improve pedestrian safety.

- ***Policy 1.2: Traffic Signals*****:** Use traffic signals and their associated features to improve pedestrian safety at dangerous intersections.

    Action 1.2.7. Consider using crossing enhancement technologies like countdown pedestrian signals at the highest pedestrian volume locations.

- ***Policy 1.3. Sidewalk Safety:*** Strive to maintain a complete sidewalk network free of broken or missing sidewalks or curb ramps.

    Action 1.3.7. Conduct a survey of all street intersections to identify corners with missing, damaged, or non-compliant curb ramps and create a plan for completing their installation.

- ***Policy 2.1: Route Network:*** Create and maintain a pedestrian route network that provides direct connections between activity centers.

    Action 2.1.8. To the maximum extent possible, make walkway accessible to people with physical disabilities.

- ***Policy 2.3: Safe Routes to Transit:*** Implement pedestrian improvements along major AC Transit lines and at BART stations to strengthen connections to transit.

    Action 2.3.1: Develop and implement street designs (like bus bulbouts) that improve pedestrian/bus connections.

    Action 2.3.3: Prioritize the implementation of street furniture (including bus shelters) at the most heavily used transit stops.

    Action 2.3.4: Improve pedestrian wayfinding by providing local area maps and directional signage at major AC Transit stops and BART stations.

- ***Policy 3.2. Land Use:*** Promote land uses and site designs that make walking convenient and enjoyable.

    Action 3.2.1. Use building and zoning codes to encourage a mix of uses, connect entrances and exits to sidewalks, and eliminate "blank walls" to promote street level activity.

> *Action 3.2.2.* Promote parking and development policies that encourage multiple destinations within an area to be connected by pedestrian trips.
>
> *Action 3.2.4*: Require contractors to provide safe, convenient, and accessible pedestrian rights-of-way along construction sites that require sidewalk closure.
>
> *Action 3.2.8*: Discourage motor vehicle parking facilities that create blank walls, unscreened edges along sidewalks, and/or gaps between sidewalks and building entrances.

City of Oakland Bicycle Master Plan

The Oakland City Council adopted the *Oakland Bicycle Master Plan Update* in December 2007. The adopted plan includes the following policy-supporting actions that are applicable to the Project:

- ***Policy 1A: Bikeway Network:*** Develop and improve Oakland's bikeway network.

> *Action 1A.1 – Bicycle Lanes (Class 2)*: Install bicycle lanes where feasible as the preferred bikeway type for all streets on the proposed bikeway network (except for the bicycle boulevards proposed for local streets with low traffic volumes and speeds).
>
> *Action 1A.3 – Bicycle Boulevards (Class 3B)*: Enhance bicycle routes on local streets by developing bicycle boulevards with signage, striping, and intersection modifications to prioritize bicycle travel.
>
> *Action 1A.6 – Dedicated Right Turn Lanes and "Slip Turns"*: Where feasible, avoid the use of dedicated right turn lanes on streets included in the bikeway network. Where infeasible, consider a bicycle through lane to the left of the turn lane or a combined bicycle lane/right turn lane.

- ***Policy 1B: Routine Accommodation:*** Address bicycle safety and access in the design and maintenance of all streets.

> *Action 1B.2 – Traffic Signals*: Include bicycle-sensitive detectors, bicycle detector pavement markings, and adequate yellow time for cyclists with all new traffic signals and in the modernization of all existing signals.

- ***Policy 1C – Safe Routes to Transit:*** Improve bicycle access to transit, bicycle parking at transit facilities, and bicycle access on transit vehicles.

> *Action 1C.1 – Bikeways to Transit Stations*: Prioritize bicycle access to major transit facilities from four directions, integrating bicycle access into the station design and connecting the station to the surrounding neighborhoods.

- ***Policy 1D – Parking and Support Facilities:*** Promote secure and conveniently located bicycle parking at destinations throughout Oakland.

> *Action 1D.6 – Bicycle Parking Ordinance*: Adopt an ordinance as part of the City's Planning Code that would require new development to include short and long-term bicycle parking.
>
> *Action 1D.7 – Development Incentives*: Consider reduced automobile parking requirements in exchange for bicycle facilities as part of transportation demand management strategies in new development.

City of Oakland Public Transit and Alternative Modes Policy

The City of Oakland adopted the Public Transit and Alternative Modes Policy, also known as the "Transit-First Policy," in October 1996 (City Council Resolution 73036 C.M.S.). This resolution supports public transit and other alternatives to single occupant vehicles, and directs the LUTE to incorporate "various methods of expediting transit services on designated streets, and encouraging greater transit use." The resolution also directs the City, in constructing and maintaining its transportation infrastructure, to resolve any conflicts between public transit and single occupant vehicles on City streets in favor of the transportation mode that provides the greatest mobility for people rather than vehicles giving due consideration to the environment, public safety, economic development, health, and social equity impacts.

City of Oakland Complete Streets Policy

The City of Oakland adopted the Complete Street Policy to Further Ensure that Oakland Streets Provide Safe and Convenient Travel Options for all Users in January 2013 (City Council Resolution 84204 C.M.S.). This resolution, consistent with the California Complete Streets Act of 2008, directs the City of Oakland to plan, design, construct, operate, and maintain the street network in the City to accommodate safe, convenient, comfortable travel for all modes, including pedestrians, bicyclists, transit users, motorists, trucks, and emergency vehicles.

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards

The City's SCA that directly pertain to transportation and circulation and that apply to the Project are listed below. If the Project is approved by the City, all applicable SCAs will be adopted as conditions of approval and required, as applicable, to help ensure no significant impacts. Because the conditions of approval are incorporated as part of the Project, they are not listed as mitigation measures.

- **TRANS SCA 1: Parking and Transportation Demand Management**

  This SCA would apply to the Project as it would generate 50 or more net new AM or PM peak-hour vehicle trips.

  Prior to issuance of a final inspection of the building permit. The project applicant shall submit a Transportation and Parking Demand Management (TDM) for review and approval by the City. The intent of the TDM plan shall be to reduce vehicle traffic and parking demand generated by the Project to the maximum extent practicable consistent with the potential traffic and parking impacts of the Project.

  The goal of the TDM shall be to achieve the following Project vehicle trip reductions (VTR):

  - Projects generating 50 – 99 net new AM or PM peak-hour vehicle trips: 10 percent VTR
  - Projects generating 100 or more net new AM or PM peak-hour vehicle trips: 20 percent VTR

The TDM plan shall include strategies to increase pedestrian, bicycle, transit, and carpool use, and reduce parking demand. All four modes of travel shall be considered, as appropriate. VTR strategies to consider include, but are not limited to, the following:

a. Inclusion of additional long term and short term bicycle parking that meets the design standards set forth in chapter five of the Bicycle Master Plan, and Bicycle Parking Ordinance (chapter 17.117 of the Oakland Planning Code), and shower and locker facilities in commercial developments that exceed the requirement.

b. Construction of and/or access to bikeways per the Bicycle Master Plan; construction of priority Bikeway Projects, on-site signage and bike lane striping.

c. Installation of safety elements per the Pedestrian Master Plan (such as cross walk striping, curb ramps, count-down signals, bulb outs, etc.) to encourage convenient and safe crossing at arterials, in addition to safety elements required to address safety impacts of the project.

d. Installation of amenities such as lighting, street trees, trash receptacles per the Pedestrian Master Plan and any applicable streetscape plan.

e. Construction and development of transit stops/shelters, pedestrian access, way finding signage, and lighting around transit stops per transit agency plans or negotiated improvements.

f. Direct on-site sales of transit passes purchased and sold at a bulk group rate (through programs such as AC Transit Easy Pass or a similar program through another transit agency).

g. Provision of a transit subsidy to employees or residents, determined by the project sponsor and subject to review by the City, if the employees or residents use transit or commute by other alternative modes.

h. Provision of an ongoing contribution to AC Transit service to the area between the development and nearest mass transit station prioritized as follows: 1) Contribution to AC Transit bus service; 2) Contribution to an existing area shuttle or streetcar service; and 3) Establishment of new shuttle or streetcar service. The amount of contribution (for any of the above scenarios) would be based upon the cost of establishing new shuttle service (Scenario3).

i. Guaranteed ride home program for employees, either through 511.org or through separate program.

j. Pre-tax commuter benefits (commuter checks) for employees.

k. Free designated parking spaces for on-site car-sharing program (such as City Car Share, Zip Car, etc.) and/or car-share membership for employees or tenants.

l. Onsite carpooling and/or vanpooling program that includes preferential (discounted or free) parking for carpools and vanpools.

m. Distribution of information concerning alternative transportation options.

n. Parking spaces sold/leased separately for residential units. Charge employees for parking, or provide a cash incentive or transit pass alternative to a free parking space in commercial properties.

o. Parking management strategies; including attendant/valet parking and shared parking spaces.

p. Requiring tenants to provide opportunities and the ability to work off-site.

q. Allow employees or residents to adjust their work schedule in order to complete the basic work requirement of five eight-hour workdays by adjusting their schedule to reduce vehicle trips to the worksite (e.g., working four, ten-hour days; allowing employees to work from home two days per week).

r. Provide or require tenants to provide employees with staggered work hours involving a shift in the set work hours of all employees at the workplace or flexible work hours involving individually determined work hours.

The TDM Plan shall indicate the estimated VTR for each strategy proposed based on published research or guidelines. For TDM Plans containing ongoing operational VTR strategies, the Plan shall include an ongoing monitoring and enforcement program to ensure the Plan is implemented on an ongoing basis during project operation. If an annual compliance report is required, as explained below, the TDM Plan shall also specify the topics to be addressed in the annual report.

The project applicant shall implement the approved TDM Plan on an ongoing basis. For projects that generate 100 or more net new AM or PM peak-hour vehicle trips and contain ongoing operational VTR strategies, the project applicant shall submit an annual compliance report for the first five years following completion of the project (or completion of each phase for phased projects) for review and approval by the City. The annual report shall document the status and effectiveness of the TDM program, including the actual VTR. If deemed necessary, the City may elect to have a peer review consultant, paid for by the project applicant, review the annual report. If timely reports are not submitted and/or the annual reports indicate that the project applicant has failed to implement the TDM Plan, the project will be considered in violation of the Conditions of Approval and the City may initiate enforcement action as provided for in these Conditions of Approval. The project shall not be considered in violation of this Condition if the TDM Plan is implemented but the VTR goal is not achieved.

- **TRANS SCA 2: Construction Traffic and Parking**

Prior to the issuance of a demolition, grading or building permit. The project sponsor and construction contractor shall meet with appropriate City of Oakland agencies to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion and the effects of parking demand by construction workers during construction of this project and other nearby projects that could be simultaneously under construction. The project sponsor shall develop a construction management plan for review and approval by the Planning and Zoning Division, the Building Services Division, and the Transportation Services Division. The plan shall include at least the following items and requirements:

a. A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes.

b. Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures will occur.

c. Location of construction staging areas for materials, equipment, and vehicles at an approved location.

d. A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an onsite complaint manager. The manager shall determine the cause of the complaints and shall take prompt action to correct the problem. Planning and Zoning shall be informed who the Manager is prior to the issuance of the first permit issued by Building Services.

e. Provision for accommodation of pedestrian flow.

f. Provision for parking management and spaces for all construction workers to ensure that construction workers do not park in on-street spaces.

g. Any damage to the street caused by heavy equipment, or as a result of this construction, shall be repaired, at the project sponsor's expense, within one week of the occurrence of the damage (or excessive wear), unless further damage/excessive wear may continue; in such case, repair shall occur prior to issuance of a final inspection of the building permit. All damage that is a threat to public health or safety shall be repaired immediately. The street shall be restored to its condition prior to the new construction as established by the City Building Inspector and/or photo documentation, at the project sponsor's expense, before the issuance of a Certificate of Occupancy.

h. Any heavy equipment brought to the construction site shall be transported by truck, where feasible.

i. No materials or equipment shall be stored on the traveled roadway at any time.

j. Prior to construction, a portable toilet facility and a debris box shall be installed on the site, and properly maintained through project completion.

k. All equipment shall be equipped with mufflers.

l. Prior to the end of each work day during construction, the contractor or contractors shall pick up and properly dispose of all litter resulting from or related to the project, whether located on the property, within the public rights-of-way, or properties of adjacent or nearby neighbors.

4.12.2 Project Transportation Characteristics

The Project would consist of about 36,000 square feet of commercial uses at the northwest corner of the 30th Street/Broadway intersection. The project site is currently a 287-space parking lot open to the public. The Project would consist of a 26,000 square-foot supermarket and 10,000 square feet of commercial space. For the Project traffic impact analysis, this EIR conservatively assumed that the commercial space would consist of 4,300 square feet of restaurant, a 3,000 square-foot bank, and 2,700 square feet of general retail.

The Project would provide 162 parking spaces with 18 spaces at the ground level and 144 spaces on the roof-top level. A ramp would connect the ground and second level parking. The Project would provide a full-access driveway on 30th Street approximately 125 feet west of Broadway.

The supermarket component of the Project would provide a loading dock on the northwest corner of the building. Trucks would access the loading dock by entering through the Project driveway on 30th Street and proceed through the ground level to the loading dock. Trucks would exit through a driveway on Broadway, about 400 feet north of 30th Street. This driveway would only be used by trucks exiting the site, and all trucks would turn right on Broadway.

Project Trip Generation

Project trip generation refers to the process for estimating the amount of vehicular traffic a project would add to the surrounding roadway system. **Table 4.12-6** presents the trip generation estimate for the Project, using data published by the Institute of Transportation Engineers (ITE) in the Ninth Edition of the *Trip Generation Manual*.

TABLE 4.12-6
PROJECT TRIP GENERATION SUMMARY

Land Use	Units [a]	ITE Code	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Peak Hour		
				In	Out	Total	In	Out	Total	In	Out	Total
Supermarket	26.0 KSF	850[b]	3,132	55	33	88	125	121	246	141	136	277
Restaurant	4.3 KSF	931[c]	387	2	1	3	21	11	32	28	19	47
Bank	3.0 KSF	912[d]	444	21	15	36	37	36	73	40	39	79
Retail	2.7 KSF	820[e]	115	2	1	3	5	5	10	7	6	13
Total			*4,078*	*80*	*50*	*130*	*188*	*173*	*361*	*216*	*200*	*416*
Pass-by Reduction [f]			-693	0	0	0	-61	-61	-122	-54	-54	-108
Net New Project Trips			**3,385**	**80**	**50**	**130**	**127**	**112**	**239**	**162**	**146**	**308**

a KSF = 1,000 square feet.
b ITE Trip *Generation (9th Edition)* land use category 850 (Grocery Store):
Daily: T = 66.95*(X) + 1391.56
AM Peak Hour: T = 3.40*(X) (62% in, 38% out)
PM Peak Hour: T = 9.48*(X) (51% in, 49% out)
Saturday Peak Hour: T = 10.65*(X) (51% in, 49% out)
c ITE *Trip Generation (9th Edition)* land use category 931 (Quality Restaurant):
Daily: T = 89.95*(X)
AM Peak Hour: T = 0.81*(X) (82% in, 18% out)
PM Peak Hour: T = 7.49*(X) (67% in, 33% out)
Saturday Peak Hour: T = 10.82*(X) (59% in, 41% out)
d ITE *Trip Generation (9th Edition)* land use category 912 (Drive-in Bank):
Daily: T = 148.15*(X)
AM Peak Hour: T = 12.08*(X) (57% in, 43% out)
PM Peak Hour: T = 24.30*(X) (50% in, 50% out)
Saturday Peak Hour: T = 26.31*(X) (51% in, 49% out)
e ITE *Trip Generation (9th Edition)* land use category 820 (Shopping Center):
Daily: T = 42.70*(X)
AM Peak Hour: T = 0.96*(X) (62% in, 38% out)
PM Peak Hour: T = 3.71*(X) (48% in, 52% out)
Saturday Peak Hour: T = 4.82*(X) (52% in, 48% out)
F ITE *Trip Generation (9th Edition) User's Guide and Handbook,* land use category 820 (Shopping Center):
PM Peak-hour pass-by rate = 34%
Saturday Peak-hour pass-by rate = 26%

SOURCE: Fehr & Peers, 2013.

The following adjustments were made to the Project trip generation:

- ***Pass-by Trips*** – Pass-by trips are trips attracted to the site from adjacent roadways as an interim stop on the way to their ultimate destination. Pass-by trips consist of vehicles that would be on the roadway network regardless of the Project; therefore, these trips result in changed travel patterns, but do not add new vehicle trips to the roadway network.

  According to the Second Edition of the ITE *Trip Generation Handbook*, the average weekday PM peak-hour pass-by reduction is 36 percent for grocery stores (land use category 850), 44 percent for restaurants (land use category 931), 47 percent for banks (land use category 912), and 34 percent for shopping center (land use category 820). The average Saturday peak-hour pass-by reduction for shopping center is 26 percent; however, ITE does not provide Saturday pass-by reduction rates for other Project uses. The shopping center category has the lowest weekday pass-by rate of the uses described above. Furthermore, ITE does not provide Saturday pass-by rates for grocery stores, banks, and restaurants, while these uses are implicitly included in the shopping center category. Therefore, this analysis conservatively applies the pass-by rates for shopping center to all uses.

  This analysis reduces the weekday PM peak-hour Project trips by 34 percent and Saturday peak-hour trips by 26 percent to account for pass-by trips, which corresponds to 122 weekday PM and 108 Saturday peak-hour trips. The pass-by trips would represent about four percent of the existing traffic volume on Broadway.

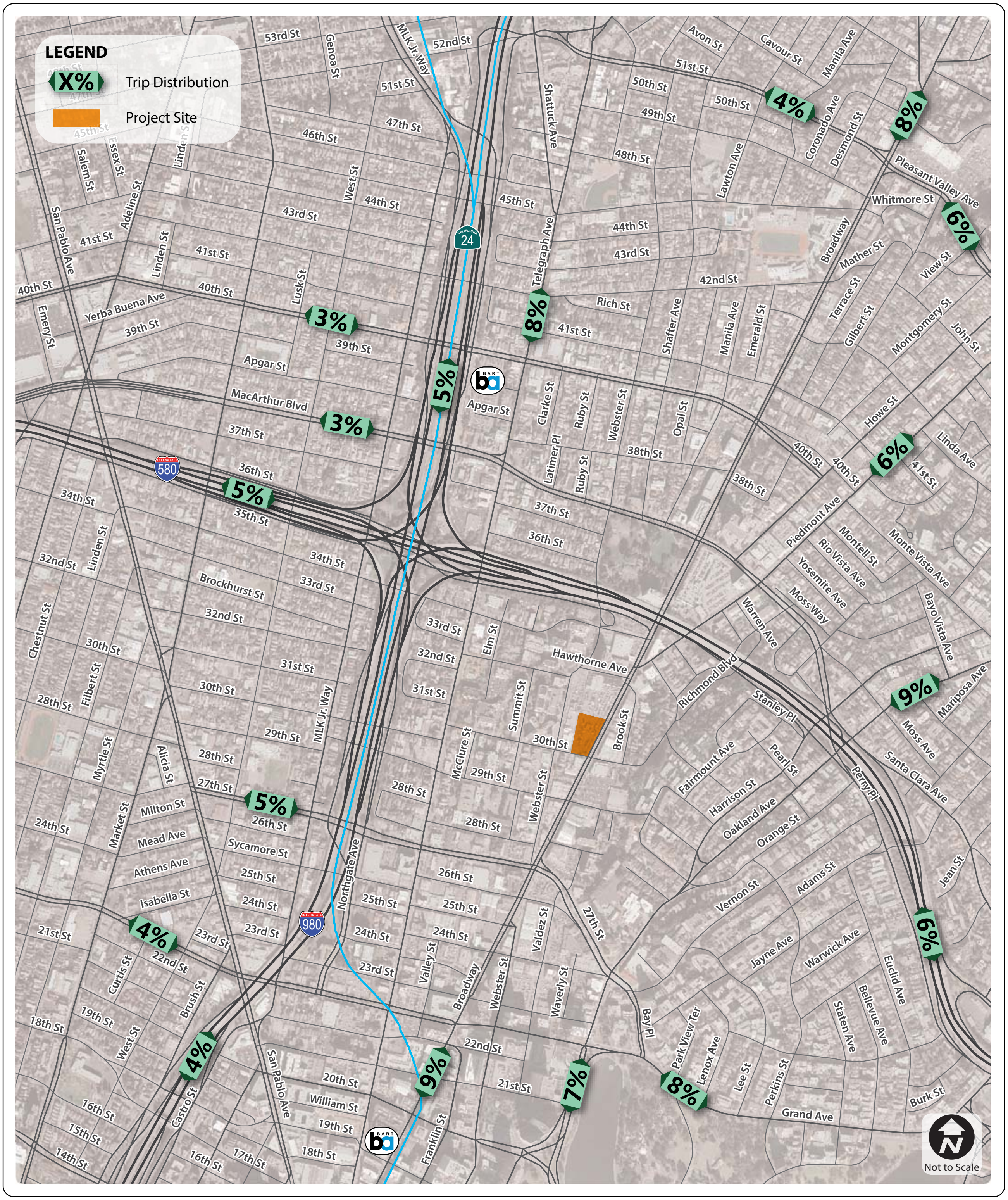
- ***Existing Parking Lot Trips*** – The Project would eliminate the existing 287-space public parking lot. However, this analysis conservatively does not account for these trips because it is understood that other off-street parking facilities in the vicinity would provide adequate vacant spaces to accommodate motorists that currently park at the project site. Thus, these motorists would continue to travel to and from this area after the completion of the Project.

The ITE data used to estimate trip generation, described above, is based on data collected at mostly single-use suburban sites where automobile is often the only travel mode. Although the Project is in a mixed-use urban environment where many trips are walk, bike, or transit trips, this analysis does not account for the non-automobile trips. Therefore, it does not conservatively reduce the ITE-based trip generation because the Project may not just serve the local neighborhood and may attract trips from a larger area.

As shown in Table 4.12-6, the Project is estimated to generate 130 weekday AM peak-hour trips, 239 weekday PM peak-hour trips, and 308 Saturday peak-hour trips. Considering that the Project would generate fewer trips during the AM peak hour than the during the PM peak hour, this EIR does not analyze potential Project impacts during the weekday AM peak hour.

Vehicle Trip Distribution and Assignment

Trip distribution is defined as the directions of approach and departure that vehicles would use to arrive at and depart from the project site. An estimated distribution of Project trips was developed based on existing travel patterns, location of complementary land uses, and results from the ACTC Countywide Travel Demand Model. **Figure 4.12-7** shows the resulting Project trip distribution.



SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-7
Trip Distribution

The trips generated by the Project, as shown in Table 4.12-6, were assigned to the roadway network according to the trip distribution shown on Figure 4.12-7. The resulting trip assignment by roadway segment is presented on **Figure 4.12-8** for the Saturday peak hour because Project trip generation is higher during the Saturday peak hour. **Figure 4.12-9** shows the Project-generated turning movements at the study intersections.

4.12.3 Impacts and Mitigation Measures

Significance Criteria/Thresholds

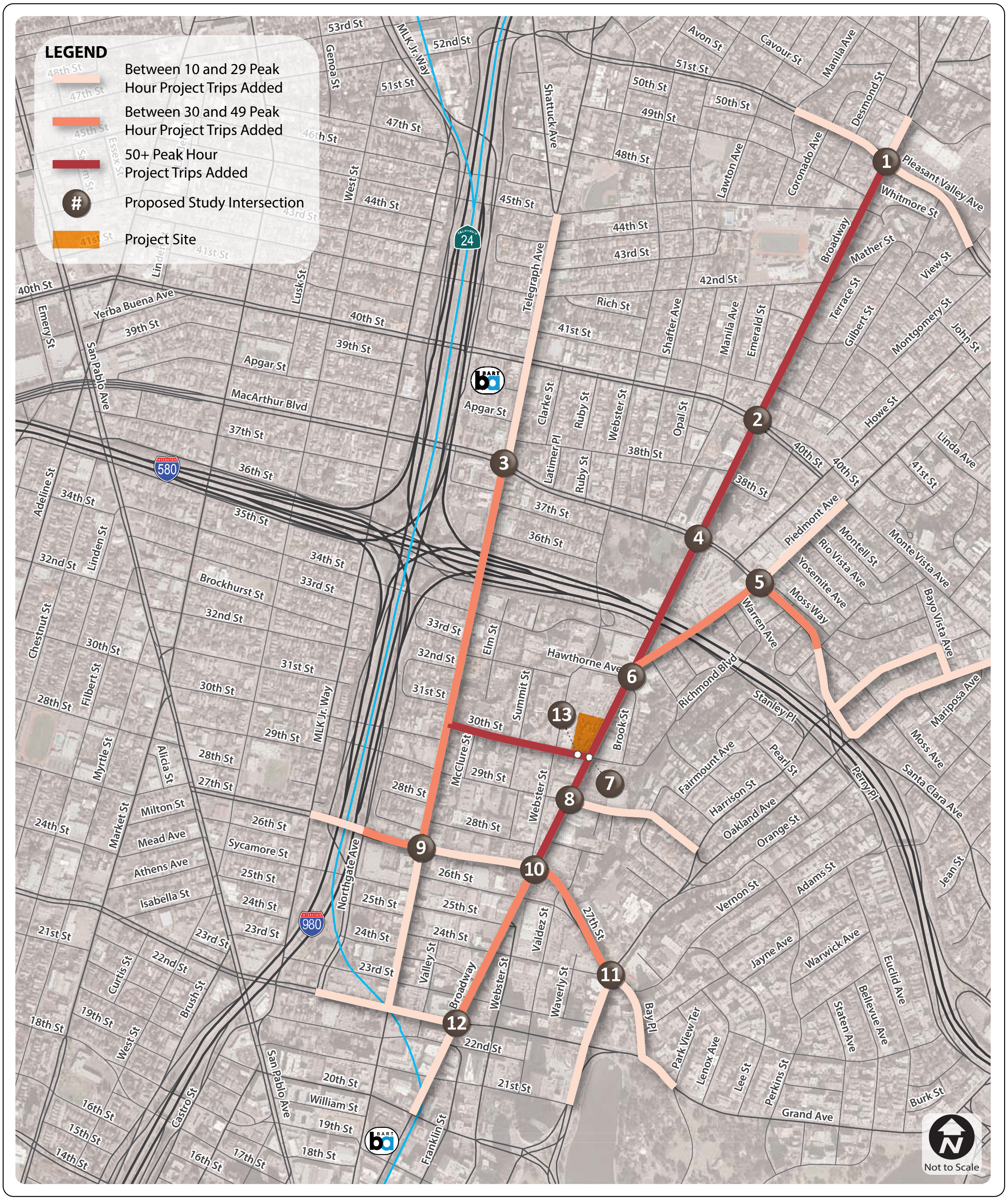
The Project would have a significant impact on the environment if it would:

> Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit, specifically:

Traffic Load and Capacity Thresholds

1. At a study, signalized intersection which is located **outside the Downtown**[2] **area and that does not provide direct access to Downtown,** the project would cause the motor vehicle level of service (LOS) to degrade to worse than LOS D (i.e., LOS E or LOS F) and cause the total intersection average vehicle delay to increase by four (4) or more seconds;
2. At a study, signalized intersection which is located **within the Downtown area or that provides direct access to Downtown**, the project would cause the motor vehicle LOS to degrade to worse than LOS E (i.e., LOS F) and cause the total intersection average vehicle delay to increase by four (4) or more seconds;
3. At a study, signalized intersection **outside the Downtown area and that does not provide direct access to Downtown** where the motor vehicle level of service is LOS E, the project would cause an increase in the average delay for any of the critical movements of six (6) seconds or more;
4. At a study, signalized intersection for all areas where the motor vehicle level of service is LOS F, the project would cause (a) the overall volume-to-capacity (v/c) ratio to increase 0.03 or more or (b) the critical movement v/c ratio to increase 0.05 or more;
5. At a study, unsignalized intersection the project would add ten (10) or more vehicles to the critical movement and after project completion satisfy the California Manual on Uniform Traffic Control Devices (MUTCD) peak-hour volume traffic signal warrant;

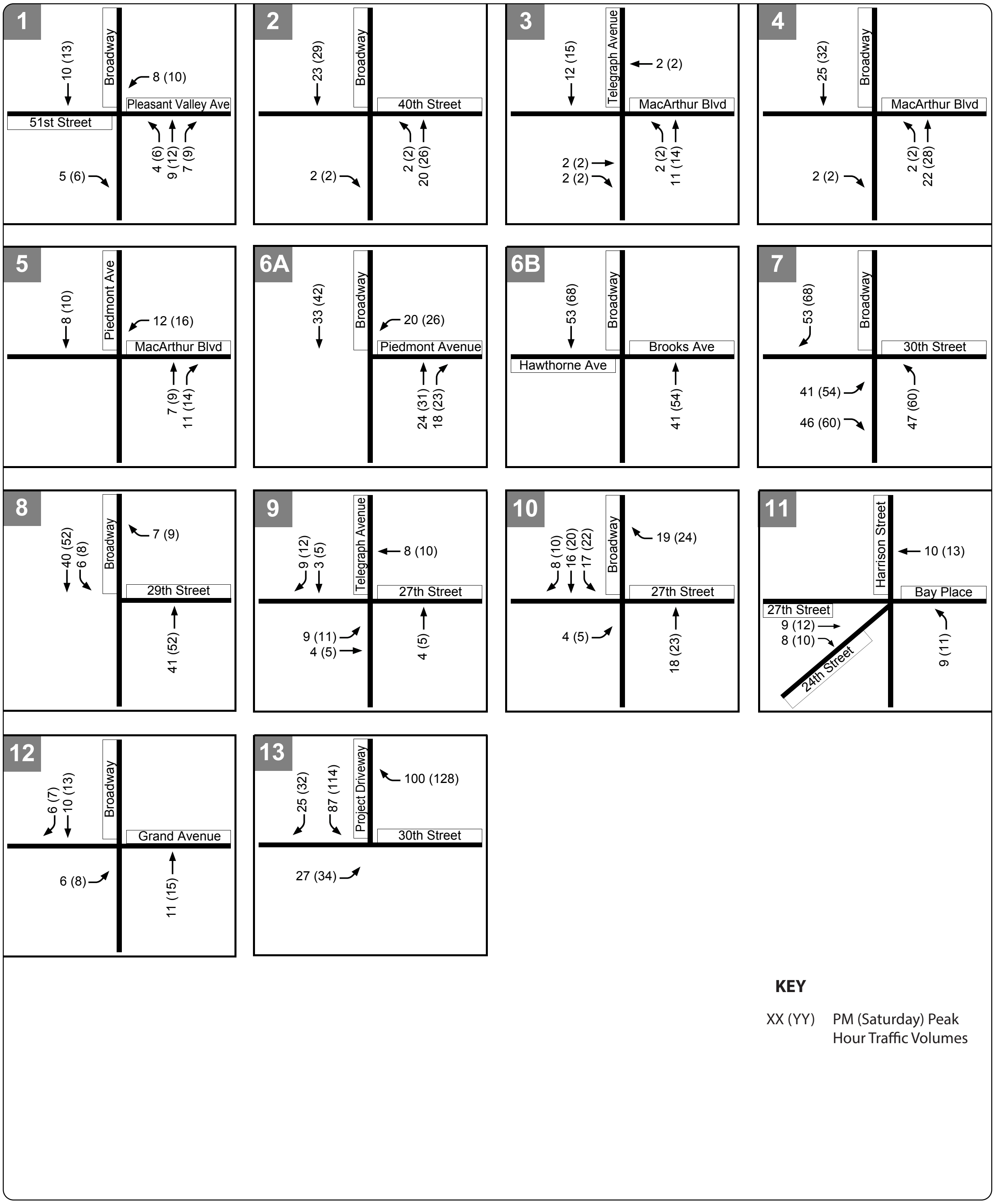
[2] The Downtown area is defined in the Land Use and Transportation Element of the General Plan (page 67) as the area generally bounded by the West Grand Avenue to the north, Lake Merritt and Channel Park to the east, the Oakland Estuary to the south, and I-980/Brush Street to the west. Intersections that provide direct access to downtown are generally defined as principal arterials within two (2) miles of Downtown and minor arterials within one (1) mile of Downtown, provided that the street connects directly to Downtown.



SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-8
Saturday Peak Hour Trip Assignment and Proposed Study Locations



SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-9
Project Trip Assignment

6. For a roadway segment of the Congestion Management Program (CMP) Network, the project would cause (a) the LOS to degrade from LOS E or better to LOS F or (b) the v/c ratio to increase 0.03 or more for a roadway segment that would operate at LOS F without the project;[3]

7. Cause congestion of regional significance on a roadway segment on the Metropolitan Transportation System (MTS) evaluated per the requirements of the Land Use Analysis Program of the CMP;[4]

8. Result in substantially increased travel times for AC Transit buses;

Traffic Safety Thresholds

9. Directly or indirectly cause or expose roadway users (e.g., motorists, pedestrians, bus riders, bicyclists) to a permanent and substantial transportation hazard due to a new or existing physical design feature or incompatible uses;

10. Directly or indirectly result in a permanent substantial decrease in pedestrian safety;

11. Directly or indirectly result in a permanent substantial decrease in bicyclist safety;

12. Directly or indirectly result in a permanent substantial decrease in bus rider safety

13. Generate substantial multi-modal traffic traveling across at-grade railroad crossings that cause or expose roadway users (e.g., motorists, pedestrians, bus riders, bicyclists) to a permanent and substantial transportation hazard.[5]

Other Thresholds

14. Fundamentally conflict with adopted City policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities adopted for the purpose of avoiding or mitigating an environmental effect and actually result in a physical change in the environment;

15. Result in a substantial, though temporary, adverse effect on the circulation system during construction of the project; or

16. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

Cumulative Impacts

17. A project's contribution to cumulative impacts is considered "considerable" (i.e., significant) when the project exceeds at least one of the thresholds listed above in a future year scenario.

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[3] Refer to the ACTC *Congestion Management Program* for a description of the CMP Network. In Oakland, the CMP Network includes all state highways plus the following streets: portions of Martin Luther King Jr. Way, Webster/Posey Tubes, 23rd Avenue, 29th Avenue, and Hegenberger Road.

[4] Refer to ACTC's *Congestion Management Program* for a description of the MTS and the Land Use Analysis Program. The ACTC will identify the roadway segments of the MTS that require evaluation in its letter commenting on the Notice of Preparation (NOP) issued by the City for the Project (see page 4.12-50 for list of these roadway segments). Note that the City is required to send NOPs and notices of proposed general plan amendments to ACTC under the Land Use Analysis Program regardless of how many project-related trips are expected to be generated.

[5] Refer to the City's SCAs for conditions related to at-grade railroad crossings.

Planning-Related Non-CEQA Issues

The following transportation-related topics are not considerations under CEQA, but should be evaluated in order to inform decision-makers and the public about these issues.

Parking-Related Impacts

The Court of Appeal has held that parking is not part of the permanent physical environment, that parking conditions change over time as people change their travel patterns, and that unmet parking demand created by a project need not be considered a significant environmental impact under CEQA unless it would cause significant secondary effects.[6] Similarly, the December 2009 amendments to the CEQA Guidelines (which became effective March 18, 2010) removed parking from the Environmental Checklist (Appendix G of the CEQA Guidelines) as an environmental factor to be considered under CEQA. Parking supply/demand varies by time of day, day of week, and seasonally. As parking demand increases faster than the supply, parking prices rise to reach equilibrium between supply and demand. Decreased availability and increased costs result in changes to people's mode and pattern of travel. However, the City of Oakland, in its review of the Project, wants to ensure that the Project's provision of parking spaces along with measures to lessen parking demand (by encouraging the use of non-auto travel modes) would result in minimal adverse effects to Project occupants and visitors, and that any secondary effects (such as on air quality due to drivers searching for parking spaces) would be minimized. As such, although not required by CEQA, parking conditions are evaluated in this document as a non-CEQA topic for informational purposes.

Parking deficits may be associated with secondary physical environmental impacts, such as air quality and noise effects, caused by congestion resulting from drivers circling as they look for a parking space. However, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, shuttles, taxis, bicycles or travel by foot), may induce drivers to shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to alternative modes of travel would be in keeping with the City's Public Transit and Alternative Modes Policy (sometimes referred to as the "Transit First" policy) and Complete Streets Policy.

Additionally, regarding potential secondary effects, cars circling and looking for a parking space in areas of limited parking supply is typically a temporary condition, often offset by a reduction in vehicle trips due to others who are aware of constrained parking conditions in a given area. Hence, any secondary environmental impacts that might result from a shortfall in parking in the vicinity of the Project are considered less than significant.

This document evaluates if the Project's estimated parking demand (both Project-generated and Project-displaced) would be met by the proposed parking supply or by the existing parking supply within a reasonable walking distance of the project site.[7] Project-displaced parking results from

6 San Franciscans Upholding the Downtown Plan v. the City and County of San Francisco (2002) 102 Cal.App.4th 656.

7 The analysis must compare the proposed parking supply with both the estimated demand **and** the Oakland Planning Code requirements.

the Project's removal of standard on-street parking, City or owned/controlled parking, and/or legally required off-street parking (non-open-to-the-public parking which is legally required).

Transit Ridership

Transit load is not part of the permanent physical environment; transit service changes over time as people change their travel patterns. Therefore, the effect of the Project on transit ridership need not be considered a significant environmental impact under CEQA unless it would cause significant secondary effects, such as causing the construction of new permanent transit facilities which in turn causes physical effects on the environment. Furthermore, an increase in transit ridership is an environmental benefit, not an adverse impact. One of the goals of the *Land Use and Transportation Element* of the Oakland General Plan is to promote transit ridership. The City of Oakland, however, in its review of the Project, wants to understand the Project's potential effect on transit ridership. As such, although not required by CEQA, transit ridership is evaluated in this document as a non-CEQA topic for informational purposes.

This document evaluates whether the Project would exceed any of the following:

- Increase the average ridership on AC Transit lines by three (3) percent at bus stops where the average load factor with the project in place would exceed 125 percent over a peak thirty minute period;
- Increase the peak-hour average ridership on BART by three (3) percent where the passenger volume would exceed the standing capacity of BART trains; or
- Increase the peak-hour average ridership at a BART station by three (3) percent where average waiting time at fare gates would exceed one minute.

Queuing

Evaluate the Project's potential effect on 95th percentile queuing. This document evaluates whether the Project would

- Cause an increase in 95th percentile queue length of 25 feet or more at a study, signalized intersection under the Existing Plus Project condition.

Traffic Control Devices

Evaluate the need for additional traffic control devices (e.g., stop signs, street lighting, crosswalks, traffic calming devices) using the *California Manual on Uniform Traffic Control Devices* (MUTCD) and applicable City standards.

Collision History

Evaluate three years of vehicle, pedestrian, and bicycle collision data for intersections and roadway segments within three blocks of the project site to determine if the Project would contribute to an existing problem or if any improvements are recommended in order to alleviate potential effects of the Project.

Analysis of the Project

The analysis that follows evaluates the traffic-related impacts of the Project during both the weekday evening (PM) and Saturday peak hours. The analysis was conducted in compliance with City of Oakland and ACTC guidelines.

Traffic conditions in the study area under the following four scenarios:

- ***Existing*** – Represents existing conditions with volumes obtained from recent traffic counts and the existing roadway system.
- ***Existing Plus Project***– Existing conditions plus traffic generated by the Project.
- ***2035 No Project*** **–** Future conditions with planned population and employment growth, and planned transportation system improvements, for the year 2035. This scenario assumes no traffic growth at the project site. Traffic projections were developed using the ACTC Model.
- ***2035 Plus Project Buildout*** **–** Future forecasted conditions for the year 2035, as determined in the 2035 No Project scenario, plus traffic generated by the Project.

This EIR analyzes future impacts under 2035 conditions only because the Project would be constructed in one phase in the next few years, and no changes in the transportation infrastructure network in the project vicinity are expected between 2020 and 2035. Therefore, an analysis of 2020 conditions would not result in identification of additional impacts.[8]

Following the intersection analysis, the Project's potential effects on: regional roadways; construction; vehicle, pedestrian and bicycle safety; and consistency with local plans is presented. Assessments of non-CEQA issues such as parking, transit ridership, and queuing are also provided.

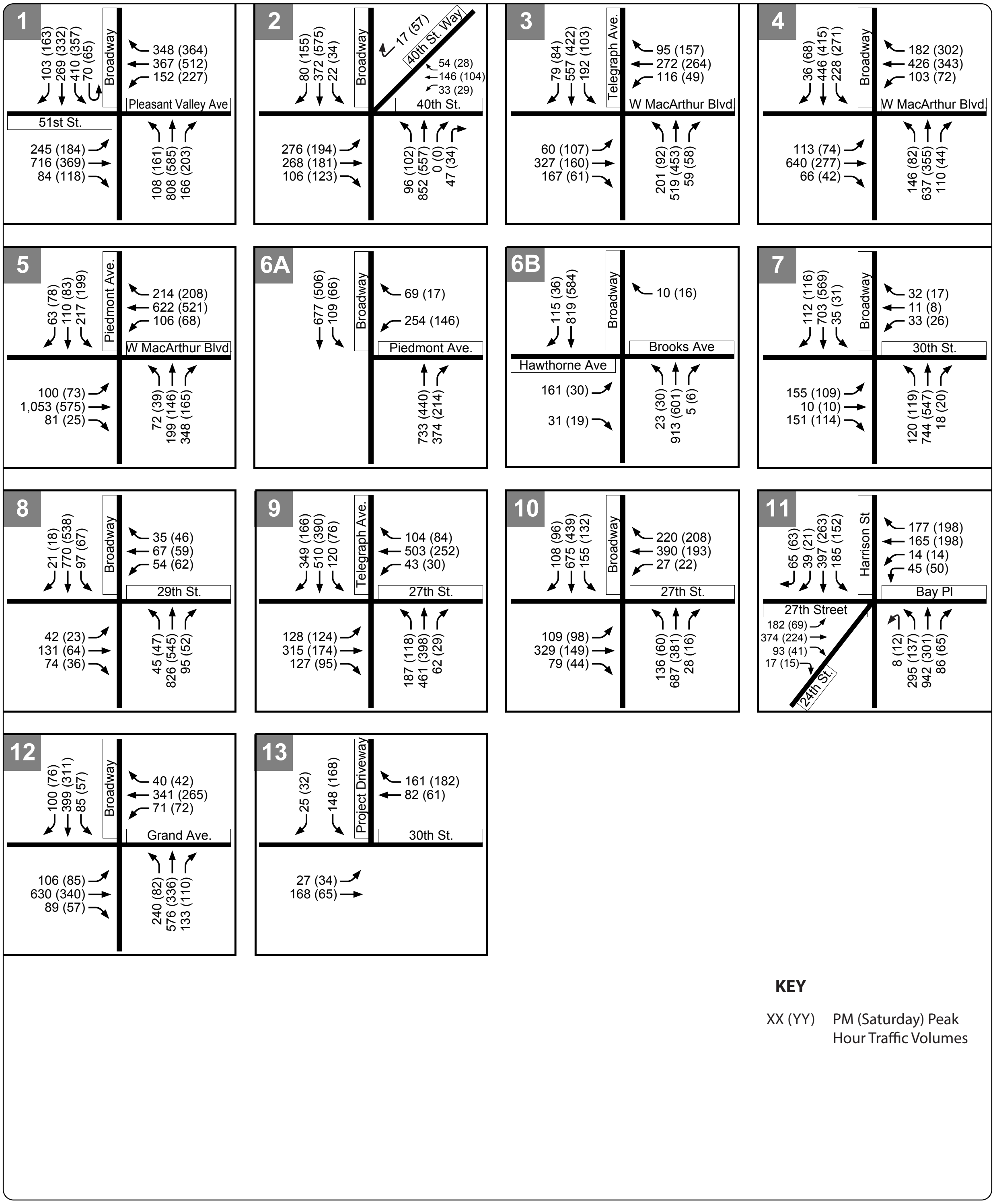
Existing Plus Project Intersection Analysis

This section analyzes the transportation system with Project-generated trips added to the existing traffic volumes. This analysis presents the extent of Project impacts relative to existing conditions based on application of Significance Thresholds #1 through #6 as listed on page 4.12-31.

Traffic Volumes

Figure 4.12-10 shows the traffic volumes for the Existing Plus Project conditions. They include existing traffic volumes plus net added traffic volumes generated by the Project.

[8] Although the future intersection operations analysis is completed for 2035 conditions only, the Congestion Management Program (CMP) and Metropolitan Transportation System (MTS) analyses include both 2020 and 2035 conditions, per ACTC guidelines.



SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-10
Existing Plus Project Conditions
PM and Saturday Peak Hour Intersection Volumes

Existing Roadway Network

The Project would not modify the roadway network. No modifications to the roadway network, including signal timing optimization, are assumed for the Existing Plus Project analysis.

Existing Plus Project Intersection Operations

Intersection LOS calculations were completed with the traffic volumes and roadway network described above. As shown in **Table 4.12-7**, all study intersections would continue to operate at the same LOS as Existing Conditions with the addition of vehicle trips generated by the Project.

Existing Plus Project Impacts and Mitigations

The Project would not cause a significant impact at the study intersections under Existing Plus Project conditions. Therefore, no mitigation measures are required.

2035 Plus Project Intersection Analysis

This section addresses the intersection impacts that would occur in 2035 with the completion of the Project. Items discussed in this section include the development of traffic volume forecasts for the 2035 No Project and 2035 Plus Project scenarios, intersection operations results, and Project impacts at intersections based on direct application of Significance Threshold #18, which references Significance Thresholds #1 through #6.

2035 Intersection Traffic Forecasts

The traffic volume forecasts were developed using the ACTC Model and existing traffic volumes. The main inputs to the 2035 forecasting process are the model outputs from a modified version of the ACTC Model and the existing traffic counts.

The ACTC Model (released in June 2011), which uses land use data consistent with Association of Bay Area Government (ABAG) *Projection 2009*, was used for this analysis. The land use database was modified to reflect more accurate land use projections in the City of Oakland including changes in land use proposed by the Broadway Valdez District and Lake Merritt Station Area Specific Plans. The PM peak-hour roadway segment volumes forecasted by the ACTC Model for year 2035 were used to develop 2035 turning movement forecasts at the study intersections using the “Furness” process, which “grows” existing turning movement volumes to reflect increases in roadway segment volumes forecasted by the ACTC Model.[9] Because the ACTC model does not include non-weekday time periods, the ratio between the weekday PM peak-hour existing and the forecasted 2035 Plus Project volumes were applied to the existing Saturday peak-hour volumes to estimate Saturday peak-hour volumes under 2035 Plus Project conditions.

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9 Outlined in NCHRP-255, the industry-standard Furness technique estimates projected (future) intersection turning movement volumes based on comparing existing traffic counts and the Model results. It uses mathematical formulae to balance roadway segment volumes approaching and departing from the intersection and thus balances turning volumes that make sense compared to the existing counts and model results. This process improves the level of confidence in the forecasted future turning movement volumes.

TABLE 4.12-7
EXISTING PLUS PROJECT INTERSECTION LOS SUMMARY

	Intersection	Traffic Control[a]	Peak Hour	Existing		Existing Plus Project		Significant Impact?
				Delay[b] (seconds)	LOS[c]	Delay[b] (seconds)	LOS[c]	
1	51st Street/Pleasant Valley Avenue/ Broadway	Signal	PM	49.6	D	50.2	D	No
			SAT	47.3	D	48.1	D	No
2	40th Street/ Broadway	Signal	PM	22.9	C	22.6	C	No
			SAT	14.1	B	14.0	B	No
3	West MacArthur Boulevard/ Telegraph Avenue	Signal	PM	12.5	B	12.5	B	No
			SAT	12.8	B	12.8	B	No
4	MacArthur Boulevard/ Broadway	Signal	PM	38.8	D	39.1	D	No
			SAT	44.0	D	44.0	D	No
5*	MacArthur Boulevard/ Piedmont Avenue	Signal	PM	37.4	D	40.1	D	No
			SAT	28.2	C	29.0	C	No
6	Piedmont Avenue/Hawthorne Avenue/Brook Street/ Broadway [d]	Signal	PM	16.9	B	17.9	B	No
			SAT	16.3	B	17.4	B	No
7	30th Street/ Broadway	Signal	PM	13.1	B	15.9	B	No
			SAT	7.9	A	9.9	A	No
8	29th Street/ Broadway	Signal	PM	13.3	B	13.4	B	No
			SAT	12.1	B	12.0	B	No
9	27th Street/ Telegraph Avenue	Signal	PM	22.9	C	23.7	C	No
			SAT	16.7	B	17.0	B	No
10	27th Street/ Broadway	Signal	PM	18.5	B	19.0	B	No
			SAT	17.6	B	18.2	B	No
11	27th Street/24th Street/ Bay Place/Harrison Street	Signal	PM	60.3	E	61.2	E	No
			SAT	52.8	D	53.4	D	No
12	Grand Avenue/ Broadway	Signal	PM	18.5	B	18.5	B	No
			SAT	13.4	B	13.3	B	No
13*	30th Street/ Project Driveway	SSSC	PM	NA	NA	4.8 (15.5)	A (C)	No
			SAT			5.9 (14.4)	A (B)	No

a Signal = intersection is controlled by a traffic signal; SSSC = Intersection is controlled by a stop-sign on the side-street approach;
b For signalized intersections, average intersection delay and LOS based on the 2000 HCM method is shown. For side-street stop-controlled intersections, delays for worst movement and average intersection delay are shown: intersection average (worst movement)
c Intersections operating at unacceptable levels are shown in **bold**.
d Piedmont Avenue/Broadway and Hawthorne Avenue/Brook Street/Broadway intersections are analyzed as one intersection because both intersections are controlled by one signal controller.
* Denotes an intersection not located in Downtown or on an arterial providing access to Downtown where LOS D is the LOS standard. All other intersections are located in Downtown or on an arterial providing access to Downtown where LOS E is the LOS standard.

SOURCE: Fehr & Peers, 2013.

Because the Project is located in the proposed Broadway Valdez Specific Plan Area, the model results from for the traffic analysis prepared for the proposed Specific Plan were used to forecast intersection volumes under the 2035 Plus Project scenario. Project-generated traffic, as summarized in Table 4.12-6 and assigned to the roadway network as shown on Figure 4.12-9, was subtracted from the 2035 Plus Project volumes to estimate intersection volumes under 2035 No Project scenario.

Figures 4.12-11 and **4.12-12** show the traffic volumes for the 2035 No Project and 2035 Plus Project scenarios, respectively.

2035 Roadway Network

The Project would not modify the roadway network. As previously described starting on page 4.12-18, this analysis assumes the following roadway modifications for the 2035 No Project conditions:

- Installation of Class 2 bicycle lanes on Broadway between 38th Street and SR 24, which would eliminate of one southbound through lane on Broadway at the 40th Street/Broadway intersection (#2).
- Reconfiguration and optimization of signal timing parameters at the West MacArthur Boulevard/Broadway intersection (#4).
- Reconfiguration and optimization of signal timing parameters at the MacArthur Boulevard/ Piedmont Avenue intersection (#5).

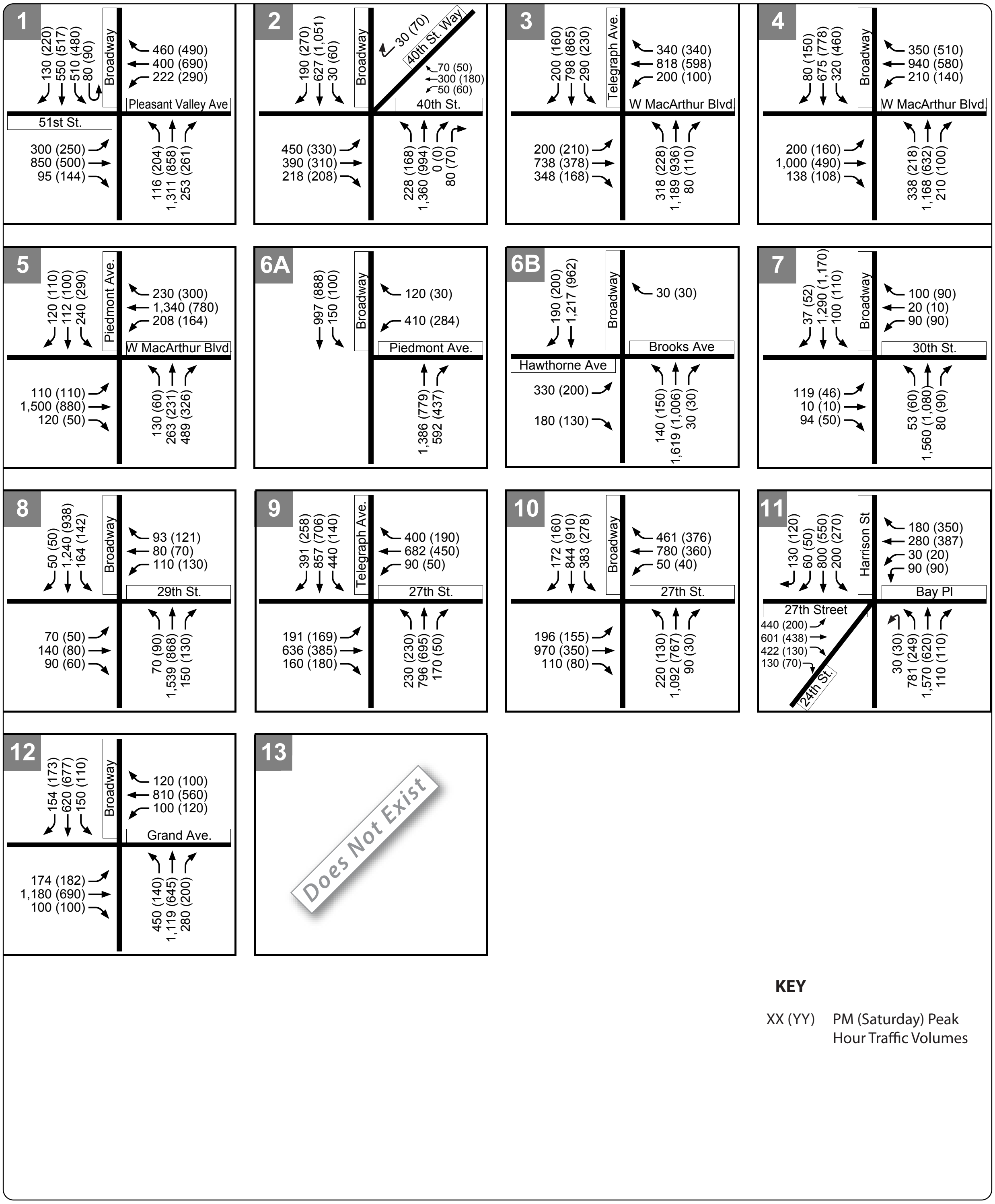
No other modifications to the roadway network, including signal timing optimization, are assumed for the 2035 analyses.

2035 Intersection Operations

Intersection LOS calculations for 2035 No Project and 2035 Plus Project scenarios were completed with the traffic volumes and roadway network described above. **Table 4.12-8** summarizes the results.

The following seven intersections are projected to operate at a deficient LOS F in 2035 regardless of the Project:

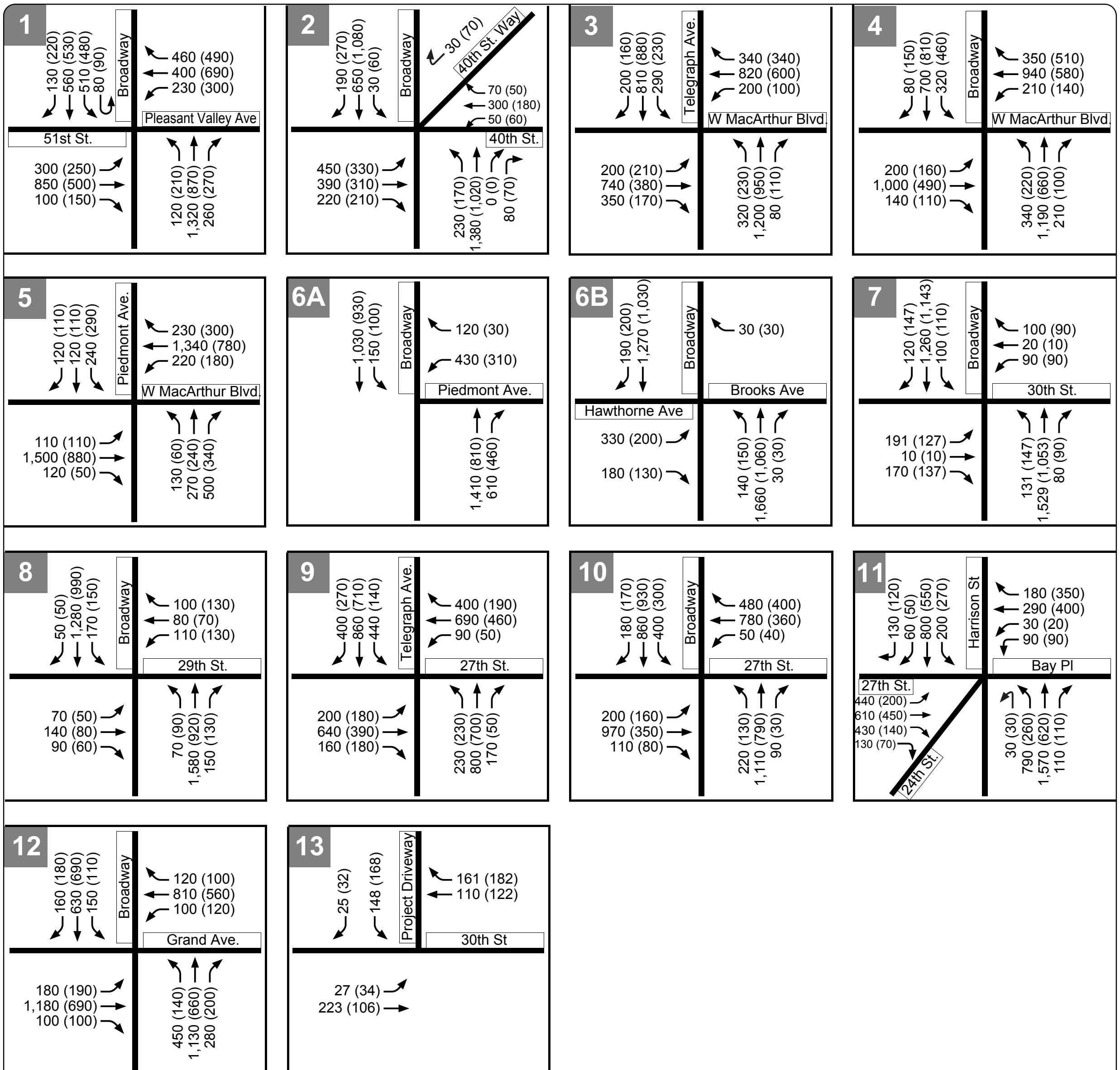
1. 51st Street/Pleasant Valley Avenue/Broadway during both weekday PM and Saturday peak hours.
3. West MacArthur Boulevard/Telegraph Avenue during the weekday PM peak hour.
6. Piedmont Avenue/Hawthorne Avenue/Brook Street/ Broadway during the weekday PM peak hour.
9. 27th Street/Telegraph Avenue during the weekday PM peak hour.
10. 27th Street/Broadway during the weekday PM peak hour.
11. 27th Street/24th Street/Bay Place/Harrison Street during both weekday PM and Saturday peak hours.
12. Grand Avenue/Broadway during the weekday PM peak hour.



SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-11
Cumulative No Project (2035) Conditions
PM and Saturday Peak Hour Intersection Volumes



KEY

XX (YY) PM (Saturday) Peak Hour Traffic Volumes

SOURCE: Fehr & Peers

The Shops at Broadway Retail Project

Figure 4.12-12

Cumulative Plus Project (2035) Conditions

PM and Saturday Peak Hour Intersection Volumes

TABLE 4.12-8
2035 INTERSECTION LOS SUMMARY

	Intersection	Traffic Control[a]	Peak Hour	2035 No Project Delay[b] (seconds)	2035 No Project LOS[c]	2035 Plus Project Delay[b] (seconds)	2035 Plus Project LOS[c]	Significant Impact?
1	51st Street/Pleasant Valley Avenue/ Broadway	Signal	PM	**115.4 (v/c=1.14)**	**F**	**118.5 (v/c=1.14)**	**F**	No
			SAT	**105.0 (v/c=1.13)**	**F**	**108.3 (v/c=1.14)**	**F**	No
2	40th Street/ Broadway	Signal	PM	64.0	E	63.7	E	No
			SAT	35.0	C	36.0	D	No
3	West MacArthur Boulevard/ Telegraph Avenue	Signal	PM	**124.5 (v/c=2.23)**	**F**	**126.5 (v/c=2.23)**	**F**	No
			SAT	37.6	D	39.7	D	No
4	MacArthur Boulevard/ Broadway	Signal	PM	77.2	E	79.1	E	No
			SAT	55.1	E	55.1	E	No
5*	MacArthur Boulevard/ Piedmont Avenue	Signal	PM	43.8	D	45.1	D	No
			SAT	32.8	C	33.4	C	No
6	Piedmont Avenue/Hawthorne Avenue/Brook Street/ Broadway [d]	Signal	PM	**85.5 (v/c=1.30)**	**F**	**91.5 (v/c=1.32)**	**F**	**Yes (5)**
			SAT	26.1	C	30.3	C	No
7	30th Street/ Broadway	Signal	PM	18.3	B	24.1	C	No
			SAT	12.6	B	17.2	B	No
8	29th Street/ Broadway	Signal	PM	35.9	D	37.7	D	No
			SAT	14.0	B	14.7	B	No
9	27th Street/ Telegraph Avenue	Signal	PM	**142.7 (v/c=2.02)**	**F**	**144.0 (v/c=2.04)**	**F**	No
			SAT	38.0	D	40.9	D	No
10	27th Street/ Broadway	Signal	PM	**92.0 (v/c=2.12)**	**F**	**102.0 (v/c=2.25)**	**F**	**Yes (5)**
			SAT	32.5	C	39.4	D	No
11	27th Street/24th Street/ Bay Place/Harrison Street	Signal	PM	**395.6 (v/c=2.00)**	**F**	**402.8 (v/c=2.01)**	**F**	**Yes (5)**
			SAT	**120.0 (v/c=1.05)**	**F**	**127.9 (v/c=1.08)**	**F**	**Yes (5)**
12	Grand Avenue/ Broadway	Signal	PM	**96.2 (v/c=1.69)**	**F**	**98.9 (v/c=1.74)**	**F**	**Yes (5)**
			SAT	21.2	C	21.3	C	No
13*	30th Street/Project Driveway	SSSC	PM	NA	NA	4.7 (17.3)	A (C)	No
			SAT			5.6 (16.5)	A (C)	No

a Signal = intersection is controlled by a traffic signal; SSSC = Intersection is controlled by a stop-sign on the side-street approach;
b For signalized intersections, average intersection delay, LOS, and volume-to-capacity ratio for intersections operating at LOS F based on the 2000 HCM method is shown. For side-street stop-controlled intersections, delays for worst movement and average intersection delay are shown: intersection average (worst movement)
c Intersections operating at unacceptable levels are shown in **bold**.
d Piedmont Avenue/Broadway and Hawthorne Avenue/Brook Street/Broadway intersections are analyzed as one intersection because both intersections are controlled by one signal controller.
* Denotes an intersection not located in Downtown or on an arterial providing access to Downtown where LOS D is the LOS standard. All other intersections are located in Downtown or on an arterial providing access to Downtown where LOS E is the LOS standard.

SOURCE: Fehr & Peers, 2013.

2035 Plus Project Impacts and Mitigations

Impact TRANS-1: The Project would increase the V/C ratio for a critical movement by 0.05 or more (Significant Threshold #5) during the weekday PM peak hour at the *Piedmont Avenue/Hawthorne Avenue/Brook Street/Broadway* intersection (#6), which would operate at LOS F under 2035 conditions. (Significant)

Mitigation Measure TRANS-1: Implement the following measures at the Piedmont Avenue/ Hawthorne Avenue/Brook Street/Broadway intersection:

- Optimize signal timing (i.e., changing the amount of green time assigned to each lane of traffic approaching the intersection).
- Coordinate the signal timing changes at this intersection with the adjacent intersections that are in the same signal coordination group.

To implement this measure, the project sponsor shall submit the following to City of Oakland's Transportation Services Division for review and approval:

- Plans, Specifications, and Estimates (PS&E) to modify intersection. All elements shall be designed to City standards in effect at the time of construction and all new or upgraded signals should include these enhancements. All other facilities supporting vehicle travel and alternative modes through the intersection should be brought up to both City standards and Americans with Disabilities Act (ADA) standards (according to Federal and State Access Board guidelines) at the time of construction. Current City Standards call for the elements listed below:
  - 2070L Type Controller with cabinet assembly
  - GPS communications (clock)
  - Accessible pedestrian crosswalks according to Federal and State Access Board guidelines with signals (audible and tactile)
  - Countdown pedestrian head module switch out
  - City standard ADA wheelchair ramps
  - Video detection on existing equipment (or new, if required)
  - Mast arm poles, full actuation (where applicable)
  - Polara push buttons (full actuation)
  - Bicycle detection (full actuation)
  - Pull boxes
  - Signal interconnect and communication with trenching (where applicable), or through (E) conduit (where applicable)- 600 feet maximum
  - Conduit replacement contingency
  - Fiber Switch
  - PTZ Camera (where applicable)
  - Transit Signal Priority (TSP) equipment consistent with other signals along corridor

- Signal timing plans for the signals in the coordination group.

The project sponsor shall fund the cost of preparing and implementing these plans. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, the Project Sponsor shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall mitigate this impact to less than significant. A straight line interpolation of intersection traffic volume between Existing and 2035 Plus Project conditions indicates that mitigation at this intersection may be required by 2034. Investigation of the need for this mitigation shall be studied at that time and in 2035 or until the mitigation measure is implemented, whichever occurs first.

After implementation of this measure, the intersection would continue to operate at LOS F during the weekday PM peak hour. However, the mitigation measure would reduce the v/c ratio for the critical movements and mitigate the impact. No secondary impacts would result from implementation of this measure.

Significance after Mitigation: Less than significant.

Impact TRANS-2: The Project would increase the total intersection v/c ratio by 0.03 or more and increase the V/C ratio for a critical movement by 0.05 or more during the weekday PM peak hour (Significant Threshold #5) at the *27th Street/Broadway* intersection (#10), which would operate at LOS F under 2035 conditions. (Significant)

Mitigation Measure TRANS-2: Implement the following measures at the 27th Street/ Broadway intersection:

- Upgrade traffic signal operations at the intersection to actuated-coordinated operations
- Provide protected left-turn phase(s) for the southbound approach.
- Optimize signal timing (i.e., changing the amount of green time assigned to each lane of traffic approaching the intersection).
- Coordinate the signal timing changes at this intersection with the adjacent intersections that are in the same signal coordination group.

To implement this measure, the project sponsor shall submit the following to City of Oakland’s Transportation Services Division for review and approval:

- PS&E to modify intersection as detailed in Mitigation Measure TRANS-1.
- Signal timing plans for the signals in the coordination group.

The project sponsor shall fund the cost of preparing and implementing these plans. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, the Project Sponsor shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall mitigate this impact to less than significant. A straight line interpolation of intersection traffic volume between Existing and 2035 Plus Project conditions indicates that mitigation at this intersection may be required by 2033. Investigation of the need for this mitigation shall be studied at that time and in 2035 or until the mitigation measure is implemented, whichever occurs first.

After implementation of this measure, the intersection would continue to operate at LOS F during the weekday PM peak hour. However, the mitigation measure would reduce the v/c ratio for the intersection and critical movements and mitigate the impact. No secondary impacts would result from implementation of this measure.

Significance after Mitigation: Less than significant.

Impact TRANS-3: The Project would increase the v/c ratio for a critical movement by 0.05 or more (Significant Threshold #5) during the weekday PM peak hour and increase the total intersection V/C ratio by 0.03 or more and increase the V/C ratio for a critical movement by 0.05 or more during the Saturday peak hour (Significant Threshold #5) at the *27th Street/24th Street/Bay Place/Harrison Street* (#11) intersection, which would operate at LOS F under 2035 conditions. (Significant and Unavoidable)

This mitigation measure is consistent with the recommendations of the Harrison Street/Oakland Avenue Community-Based Transportation Plan (CBTP) completed in 2010 (see page 4.12-18 for more detail).

Mitigation Measure TRANS-3: Implement the following measures at the 27th Street/ 24th Street/Bay Place/Harrison Street intersection:

- Reconfigure the 24th Street approach at the intersection to restrict access to 24th Street to right turns only from 27th Street and create a pedestrian plaza at the intersection approach.
- Convert 24th Street between Valdez and Harrison Streets to two-way circulation and allow right turns from 24th Street to southbound Harrison Street south of the intersection, which would require acquisition of private property in the southwest corner of the intersection.
- Modify eastbound 27th Street approach from the current configuration (one right-turn lane, two through lanes, and one left-turn lane) to provide one right-turn lane, one through lane, and two left-turn lanes.
- Realign pedestrian crosswalks to shorten pedestrian crossing distances.
- Reduce signal cycle length from 160 to 120 seconds, and optimize signal timing (i.e., changing the amount of green time assigned to each lane of traffic approaching the intersection).
- Coordinate the signal timing changes at this intersection with the adjacent intersections that are in the same signal coordination group.

To implement this measure, the project sponsor shall submit the following to City of Oakland's Transportation Services Division for review and approval:

- PS&E to modify intersection as detailed in Mitigation Measure TRANS-1.
- Signal timing plans for the signals in the coordination group.

The project sponsor shall fund the cost of preparing and implementing these plans. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, the Project Sponsor shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall be considered the equivalent of implementing the mitigation measure, which would still result in significant unavoidable impacts. A straight line interpolation of intersection traffic volume between Existing and 2035 Plus Project conditions indicates that mitigation at this intersection may be required by 2033. Investigation of the need for this mitigation shall be studied at that time and in 2035 or until the mitigation measure is implemented, whichever occurs first.

After implementation of this measure, the intersection would continue to operate at LOS F during the weekday PM peak hour and improve to LOS D during the Saturday peak hour. Although the mitigation measure would reduce the total intersection v/c ratio during the weekday PM peak hour, it would not reduce the v/c ratio for critical movements to 0.05 or less. Therefore, the impact would remain significant and unavoidable.

No other feasible mitigation measures are available that would mitigate the project impacts at the 27th Street/24th Street/Bay Place/Harrison Street intersection. Traffic operations at the intersection can be further improved by providing additional automobile travel lanes, such as a third lane on northbound or southbound Harrison Street, or a second through lane on eastbound 27th Street. However, these modifications cannot be accommodated within the existing automobile right-of-way and would require additional right-of-way, and/or loss of existing bicycle lanes, medians and/or on-street parking, and are considered to be infeasible. Therefore, the impact is considered significant and unavoidable.

This mitigation measure would also reduce pedestrian delays at the intersection and improve pedestrian safety by realigning the crosswalks at the intersection and reducing pedestrian crossing distances. No other secondary impacts would result from implementation of this measure.

Significance after Mitigation: Significant and Unavoidable.

Impact TRANS-4: The Project would increase the total intersection v/c ratio by 0.03 or more and increase the v/c ratio for a critical movement by 0.05 or more during the weekday PM peak hour (Significant Threshold #5) at the *Grand Avenue/ Broadway* intersection (#12), which would operate at LOS F under 2035 conditions. (Significant)

Mitigation Measure TRANS-4: Implement the following measures at the Grand Avenue/ Broadway intersection:

- Provide permitted-protected left-turn phasing for the northbound approach.
- Optimize signal timing (i.e., changing the amount of green time assigned to each lane of traffic approaching the intersection).

- Coordinate the signal timing changes at this intersection with the adjacent intersections that are in the same signal coordination group.

To implement this measure, the project sponsor shall submit the following to City of Oakland's Transportation Services Division for review and approval:

- PS&E to modify intersection as detailed in Mitigation Measure TRANS-1.
- Signal timing plans for the signals in the coordination group.

The project sponsor shall fund the cost of preparing and implementing these plans. However, if the City adopts a transportation fee program prior to implementation of this mitigation measure, the Project Sponsor shall have the option to pay the applicable fee in lieu of implementing this mitigation measure and payment of the fee shall mitigate this impact to less than significant. A straight line interpolation of intersection traffic volume between Existing and 2035 Plus Project conditions indicates that mitigation at this intersection may be required by 2034. Investigation of the need for this mitigation shall be studied at that time and in 2035 or until the mitigation measure is implemented, whichever occurs first.

After implementation of this measure, the intersection would continue to operate at LOS F during the weekday PM peak hour. However, the mitigation measure would reduce the v/c ratio for the intersection and critical movements and mitigate the impact. No secondary impacts would result from implementation of this measure.

Significance after Mitigation: Less than significant.

2035 Plus Project Mitigated Conditions

Table 4.12-9 summarizes intersection operations after implementation of the mitigation measures described above. Mitigation measures would reduce three of the four identified significant impacts (Impacts TRANS-1, TRANS-2, and TRANS-4) to less than significant levels. Impact TRANS-3 at the 27th Street/24th Street/Bay Place/Harrison Street intersection would remain significant and unavoidable.

Required Congestion Management Program (CMP) Evaluation

The CMP evaluation is based on application of Significance Thresholds #7 and #8. The Alameda County CMP requires the assessment of development-driven impacts to regional roadways. Because the Project would generate more than 100 "net new" PM peak-hour trips, ACTC requires the use of the Countywide Travel Demand Forecasting Model to assess the impacts on regional roadways near the project site. The CMP and Metropolitan Transportation System (MTS) roadways in the project vicinity identified in the NOP comments by ACTC (August 17, 2012 letter) include I-980, San Pablo Avenue, Telegraph Avenue, Broadway, Harrison Street, Grand Avenue, and 14th Street.[10]

[10] The roadway segments included in this evaluation are not based on an assessment of the Project trip distribution or application of screening criteria to determine if the project would contribute enough new trips to warrant analysis.

TABLE 4.12-9
2035 MITIGATED CONDITIONS INTERSECTION LOS SUMMARY

	Intersection	Traffic Control[a]	Peak Hour	2035 No Project		2035 Plus Project		2035 Plus Project Mitigated		Significance After Mitigation
				Delay[b] (seconds)	LOS[c]	Delay[b] (seconds)	LOS[c]	Delay[b] (seconds)	LOS[c]	
6	Piedmont Avenue/Hawthorne Avenue/Brook Street/Broadway	Signal	PM	**85.5 (v/c=1.30)**	**F**	**91.5 (v/c=1.32)**	**F**	**93.2 (v/c=1.31)**	**F**	Less than Significant
			SAT	26.1	C	30.3	C	30.6	C	
10	27th Street/Broadway	Signal	PM	**92.0 (v/c=2.12)**	**F**	**102.0 (v/c=2.25)**	**F**	**96.2 (v/c=1.69)**	**F**	Less than Significant
			SAT	32.5	C	39.4	D	26.7	C	
11	27th Street/24th Street/ Bay Place/Harrison Street	Signal	PM	**395.6 (2.00)**	**F**	**402.8 (v/c=2.01)**	**F**	**189.3 (v/c=1.39)**	**F**	Significant and Unavoidable
			SAT	**120.0 (v/c=1.05)**	**F**	**127.9 (v/c=1.08)**	**F**	51.3	D	
12	Grand Avenue/Broadway	Signal	PM	**96.2 (v/c=1.69)**	**F**	**98.9 (v/c=1.74)**	**F**	**87.6 (v/c=1.56)**	**F**	Less than Significant
			SAT	21.2	C	21.3	C	22.9	C	

a Signal = intersection is controlled by a traffic signal.
b For signalized intersections, average intersection delay, LOS, and volume-to-capacity ratio for intersections operating at LOS F based on the 2000 HCM method is shown. For side-street stop-controlled intersections, delays for worst movement and average intersection delay are shown: intersection average (worst movement)
c Intersections operating at unacceptable levels (LOS F) are shown in **bold**.

SOURCE: Fehr & Peers, 2013.

The ACTC Model used in this study is a regional travel demand model that uses socio-economic data and roadway and transit network assumptions to forecast traffic volumes and transit ridership using a four-step modeling process that includes trip generation, trip distribution, mode split, and trip assignment. This process takes into account changes in travel patterns due to future growth and balances trip productions and attractions. This version of the Countywide Model is based on Association of Bay Area Governments (ABAG) *Projections 2009* land uses for 2020 and 2035.

For the purposes of this CMP and MTS Analysis, the Project is assumed to not be included in the ACTC Model in order to present a more conservative analysis. The traffic forecasts for the 2020 and 2035 scenarios were extracted from the ACTC Model for the CMP and MTS roadway segments from that model and used as the "No Project" forecasts. Vehicle trips generated by the Project were added to the "No Project" forecasts to estimate the "Plus Project" forecasts.[11]

The CMP and MTS segments were assessed using a v/c ratio methodology. For freeway segments, a per-lane capacity of 2,000 vehicles per hour (vph) was used, consistent with the latest CMP documents. For surface streets, a per-lane capacity of 800 vph was used. Roadway segments with a v/c ratio greater than 1.00 signify LOS F.

The "Plus Project" results were compared to the baseline results for the 2020 and 2035 horizon years. **Appendix G, part B.7** (to this Draft EIR), provides the 2020 and 2035 peak-hour volumes, v/c ratios and the corresponding levels of service for without and with project conditions.

The Project would contribute to 2020 and 2035 increases in traffic congestion on MTS roadways. However, the Project would not cause a roadway segment on the MTS to degrade from LOS E or better to LOS F. The Project also would not increase the v/c ratio by more than three percent for roadway segments that would operate at LOS F without the Project. This is a less than significant impact, and as a result no mitigation measures are required.

Transit Travel Time

The discussion of transit travel time is based on application of Significance Threshold #9. In general, the City of Oakland has no basis to establish a numerical threshold for "substantially increased travel times" due to several factors:

- First, bus service, in general, is extremely transitory, and can change quite frequently, as is the case with AC Transit's bus network. Existing routes may be eliminated, or new routes

[11] Due to differences in the land use assumptions and differences in analysis methodologies, the forecasted traffic volumes on the roadway links can be different from the intersection volumes, particularly at the local level. The first area of difference is the land use data sets employed for the intersection forecasts and the MTS forecasts. The intersection forecasts, which are used to assess project traffic impacts on City of Oakland intersections, are based on land use data adjusted to reflect all past, present, existing, approved, pending and reasonably foreseeable projects in the City of Oakland, which differs from the data in the ACTC Model. The second area of difference is the use of the Furness process. The intersection forecasts use the output of the ACTC Model as an input to develop intersection volumes in conjunction with existing traffic counts. The CMP and MTS roadway analysis is based on the outputs of the ACTC Model directly on a roadway segment level. It is not unusual to have discrepancies given that the two analyses measure impacts at a different scale. For local streets, intersections are typically a more accurate measure of operating conditions because the capacity of an urban street, defined as the number of vehicles that can pass through its intersections, is controlled by the capacity at its intersections.

may be put in service by the time the Project is completed. Similar to parking, transit service is not part of the physical environment, and can change over time in response to external factors. In fact, AC Transit has generally reduced its bus service over the past few years in response to budget issues.

- Second, any numerical threshold to determine the significance of increased travel times needs to consider additional characteristics of the bus service, including its headway (the amount of time between scheduled trips) and total travel time. Considering the transitory nature of bus service, establishing such thresholds is not reasonable, as service can be rerouted, eliminated, or created at any time. Consideration would also have to be given to different types of transit service (e.g., trunk service, Transbay service, local service, and community service), as they generally operate with different characteristics.

- Third, unlike the situation for intersections or roadway facilities, there are no well-established methodologies for characterizing the operations of transit service in relation to travel times. For intersections, clear distinctions are made between intersections that operate at acceptable conditions (e.g., LOS D or better) and those that operate at unacceptable conditions (e.g., LOS E or LOS F), and separate impact thresholds are provided. For bus service, however, there is no well-established LOS equivalent for characterizing transit service in relation to travel times.

The three factors described above would make establishing numerical thresholds for AC Transit travel times difficult and impractical, as the City would have little background or experience on which to base such thresholds. However to the extent feasible, this section provides an analysis of how the Project would affect transit travel times for bus local routes.

Currently, the project site is served by two local bus routes: Route 51A along Broadway adjacent to the project site and Routes 1/1R along Telegraph Avenue, about a quarter-mile west of the project site. The traffic generated by the Project would slightly increase congestion along these two corridors. Based on the intersection operations analysis presented in previous sections by comparing travel times under Existing and Existing Plus Project conditions, the additional traffic generated by the Project would increase peak-hour travel times along these corridors by less than five seconds. The resulting increases would have a minor effect on transit service within the area as the estimated increase is within the variability in travel time experienced by each bus on these corridors. This is a less than significant impact, and no mitigation measures are required.

Vehicle, Pedestrian and Bicycle Safety

The discussion of vehicle, pedestrian, and bicycle safety is based on application of Significance Thresholds #10 through #14. The Project would result in increased vehicular traffic and pedestrian and bicycle activity in and around the project area. However, the Project would not modify the streets serving the project site. Access and circulation for different travel modes are discussed below.

Transportation Hazards

The discussion of transportation hazards is based on application of Significance Threshold #10. The site plan for the Project has not been finalized; the final project design would be reviewed to ensure consistency with applicable design standards, such as adequate sight distance for pedestrians and vehicles at project driveways. The final design for the Project would minimize potential conflicts between various modes and provide safe and efficient pedestrian, bicycle, and vehicle circulation within the site and between the project and the surrounding circulation systems.

The Project does not propose any changes to the public right-of-way and would not change the physical design of the streets surrounding the site. In addition, uses proposed by the Project are consistent with existing uses in the surrounding neighborhoods. This is a less than significant impact, and no mitigation measures are required.

Pedestrian Safety

The discussion of pedestrian safety is based on application of Significance Threshold #11. The Project proposes the following physical changes to the pedestrian environment as part of the project:

- The supermarket component of the project would be set back four feet from the Broadway frontage, which would widen the adjacent sidewalk from ten to 14 feet.

- A pedestrian plaza would be provided between the retail components of the project and the adjacent Broadway sidewalk, which would continue to remain at ten feet. The pedestrian plaza would be connected to the Broadway sidewalk by steps due to the small elevation difference between Broadway and the plaza.

- The project would eliminate four of the five existing curb-cuts along the Broadway frontage. Although none of the existing curb-cuts are currently in use, their elimination would provide a more level and uniform sidewalk along the project frontage. The remaining curb-cut would be at the northeast corner of the project, about 400 feet north of 30th Street. It would only be used by trucks exiting the site and turning right onto southbound Broadway. Considering that the driveway would provide adequate sight distance in both directions of the adjacent sidewalk, potential conflicts between trucks exiting the driveway and pedestrians walking along Broadway would be minimal.

As part of the project construction, the Project would improve the sidewalks adjacent to the project site. The following specific improvements are expected:

- Repair cracked and uneven sidewalks including providing uniform material along the project frontage on 30th Street

- Upgrade existing curb ramps to meet ADA design requirements at the 30th Street/ Broadway intersection

- Provide tree grates or planter boxes for trees within sidewalks

Pedestrian access to the various project components would be provided through entrances along the Broadway frontage of the project. Pedestrian access to and from the rooftop parking would be through a set of elevators on the east side of the project and two set of stairs: on the east side of the site connecting to Broadway and in the southwest corner of the site connecting to 30th Street.

The Project would generate additional pedestrian activity in the surrounding areas. The project site is adjacent to the signalized 30th Street/Broadway intersection (#7), which is expected to experience increased pedestrian activity. The intersection operations analysis presented earlier in this chapter did not identify a significant impact at this intersection. The signalized intersection provides striped crosswalks and audible signals on all approaches of the intersection. However, it does not provide pedestrian signal heads on any of the intersection approaches. It also provides one curb ramp for each intersection corner with only the southwest corner curb ramp providing a tactile surface with truncated domes.

Just north of the project site on Broadway, a midblock high visibility uncontrolled crosswalk (i.e., “ladder crossing”) is provided across Broadway. The crossing provides a center median and advance yield lines in both directions of Broadway. This crossing would most likely be used by pedestrians travelling between the site and locations north and east.

Automobile access to the project site would be provided through a full access driveway on 30th Street about 100 feet west of Broadway. Based on the project site plan dated July 26, 2013, the driveway would provide adequate sight distance for exiting vehicles and the sidewalk on the west (uphill on 30th Street) of the project site.

Mitigation measures TRANS-1 through TRANS-4, which require upgrades to the traffic signal equipment, would also include improvements to pedestrian environment, such as providing count-down pedestrian signal heads, in order to comply with the local, state, and federal requirements, which would improve pedestrian safety. Mitigation Measures TRANS-1 and TRANS-4 would replace existing permissive left-turn signal phasings with protected left-turn and permitted-protected left-turns, respectively. Both treatments would reduce potential conflicts between left-turning vehicles and opposing vehicles and pedestrians in comparison to current conditions. Although these mitigation measures are not required to mitigate impacts on pedestrian safety, they would improve pedestrian safety.

The Project would not result in permanent substantial decrease in pedestrian safety. This is a less than significant impact, and no mitigation measures are required.

While not required to address a CEQA impact, the following recommendation, which will be imposed as a Condition of Approval, would improve pedestrian access and circulation in the vicinity of the Project.

Recommendation TRANS-5: Implement the following measures:

- Provide the following at the signalized 30th Street/Broadway intersection:
  - Pedestrian signal heads with count-down signals at the four crosswalks at the intersection; however, if the existing signal equipment cannot accommodate new pedestrian signal heads, replace the existing signal equipment necessary to include these facilities;

  - Directional curb ramps at all four corners of the intersection aligning with the crosswalks, avoiding, or relocating if necessary, the existing signal poles.
  - Consider providing Leading Pedestrian Intervals for the pedestrian crossings at this intersection.
  - Coordinate these improvements at 30th Street/Broadway intersection with AC Transit and Recommendation TRANS-6.
- Provide the following at the unsignalized midblock crossing on Broadway just north of the project site:
  - Bulbouts on both sides of the crossing
  - Rectangular Rapid Flash Beacons (RRFB) for both directions of Broadway

Bicyclist Safety

The discussion of bicyclist safety is based on application of Significance Threshold #12. The Project does not propose any physical changes to the bicycle infrastructure surrounding the site.

The Project would generate additional bicycle activity in the surrounding areas. The existing bicycle facilities surrounding the site, including on Broadway, Webster and 27th Streets would continue to provide bicycle access to the project site.

The Project would provide long-term bicycle parking in the ground level garage, which would be accessed through the driveway on 30th Street. The project would provide short-term bicycle parking along the Broadway frontage of the project, which would be accessed from the existing bicycle lanes on Broadway. Bicyclists can use the signalized 30th Street/ Broadway intersection or the midblock crossing just north of the project site to travel between the project site and the northbound Broadway bicycle lanes.

Mitigation measures described in previous sections that require additional upgrades to the traffic signal equipment would also include improvements to bicycle environment, such as bicycle actuation, in order to comply with the local, state, and federal requirements, which would improve bicyclist safety. Although these mitigation measures are not required to mitigate impacts on bicycle safety, they would improve bicycle safety.

The Project would not result in permanent substantial decrease in bicycle safety. This is a less than significant impact, and no mitigation measures are required.

Bus Rider Safety

The discussion of bus rider safety is based on application of Significance Threshold #13. Bus riders would use the pedestrian facilities to travel between the bus stops and the project site. Beyond the changes to the pedestrian environment described above, the Project does not propose any physical changes to the infrastructure serving bus riders.

The nearest bus stops to the project site are on Broadway:

- Southbound Route 51A bus stop is provided just north of 30th Street adjacent to the project site
- Northbound Route 51A bus stop is provided just north of 29th Street about 400 feet of the project site

Both bus stops currently provide a bench and trash receptacle. Neither stop provides a bus shelter because of inadequate sidewalk width.

The Project would not result in permanent substantial decrease in bus rider safety. This is a less than significant impact, and no mitigation measures are required.

While not required to address a CEQA impact, the following recommendation, which will be imposed as a Condition of Approval, would improve access and comfort for bus riders and reduce bus travel times.

> **Recommendation TRANS-6:** Coordinate with AC Transit to implement the following, which are consistent with the draft improvements for Route 51 TPI:
>
> - Move the southbound Route 51A bus stop from just north of 30th Street to just south of 30th Street, and provide a bulbout at the bus stop and amenities such as a shelter and bench.
> - Move the northbound Route 51A bus stop from just north of 29th Street to just north of 30th Street, extend the existing bulbout to accommodate buses, and provide amenities such as a shelter and bench.

At-Grade Railroad Crossings

The discussion of at-grade railroad crossing safety is based on application of Significance Threshold #14. The Project is not located near any at-grade railroad crossings. Therefore, it will not generate substantial traffic of any travel mode travelling across at-grade railroad crossings. This is a less-than-significant impact, and no mitigation measures are required.

Consistency with Adopted Policies, Plans or Programs Supporting Alternative Transportation

The discussion of consistency with adopted policies, plans or programs supporting alternative transportation is based on application of Significance Threshold #15. A discussion of applicable policies and plans is provided below. In general, the Project and the associated mitigation measures presented in this DEIR, are consistent with these policies, plans and programs, and would not cause a significant impact by conflicting with adopted policies, plans, or programs supporting public transit, bicycle, or pedestrian.

The City of Oakland General Plan LUTE, as well as the City's Public Transit and Alternative Mode and Complete Streets Policies, states a strong preference for encouraging the use of non-automobile transportation modes, such as transit, bicycling, and walking. The Project would encourage the use of non-automobile transportation modes by providing retail uses in a walkable urban environment with quality bicycle infrastructure and transit service. Specifically, the site is in proximity to residential neighborhoods, two major employment centers (Alta Bates and Kaiser Medical Centers), AC Transit's Route 51A (one of the busiest AC Transit bus routes), the "Free B" Shuttle, which stops about a quarter-mile south of the project site, and Class 2 bicycle lanes on Broadway.

As part of the City's TRANS SCA 1, the project would implement a TDM program to encourage more employees and customers to shift from driving alone to other modes of travel. Potential TDM measures may include, but are not limited to, awareness programs, direct transit sales to employees, parking management strategies, and physical improvements that encourage walking, bicycling, and transit. The components of the proposed TDM program have not been finalized. A TDM program may not be as effective for commercial developments as other types of developments. Typically, TDM programs are most effective for developments, such as office buildings, where most trips are daily peak period commute trips. In general, many retail employees do not work every day and have irregular work hours. Employees may start and/or end their work shift outside the peak commute periods and as a result may not have access to convenient transit. Most customers would not travel to the site daily and may make large purchases, which may not be convenient to transport by walking, bicycling, or transit.

As previously described, the Project would not alter the public right-of-way in the project vicinity. Therefore, it is consistent with both the City's *Pedestrian Master Plan* and *Bicycle Master Plan* by not altering any existing pedestrian or bicycle facilities in the surrounding areas and would not adversely affect installation of future facilities. The Project would also include short-term and long-term bicycle parking that encourage bicycle activity (addressed in more detail in a subsequent section). Recommendations TRANS-5 and TRANS-6 would improve access, circulation, safety, and comfort for pedestrians, bicyclists, and bus riders, further encouraging the use of these modes in the project vicinity.

The Project would not conflict with adopted City policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities. This is a less than significant impact, and no mitigation measures are required.

Construction-Period Impacts

The discussion of construction-period impacts is based on application of Significance Threshold #16. During the construction period, temporary and intermittent transportation impacts may result from truck movements as well as construction worker vehicles to and from the project site. The construction-related traffic may temporary reduce capacities of roadways in the project vicinity because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles.

Considering the proximity of freeway ramps on 27th Street, it is expected that construction trucks on local roadways would be limited to 27th Street, Telegraph Avenue, Broadway, and 30th Street. Truck traffic that occurs during the peak commute hours (7:00 to 9:00 AM and 4:00 to 6:00 PM) may result in worse LOS and higher delays at study intersections during the construction period. Also, if parking of construction workers' vehicles cannot be accommodated within the project site, it would temporarily increase parking occupancy levels in the area.

Potential construction activity along the Broadway and 30th Street frontages, especially in the public right-of-way, could also result in temporary closure of sidewalks, prohibition of on-street parking, and may impact the operations of AC Transit Route 51A buses along Broadway.

The City of Oakland TRANS SCA 2 (*Construction Traffic and Parking*), as listed above, requires that a Construction Traffic Management Plan be developed as part of a larger Construction Management Plan to address potentially significant impacts during the project's construction. To further implement TRANS SCA 2, the Construction Traffic Management Plan developed for the project shall include the following:

m) A set of comprehensive traffic control measures for motor vehicles, transit, bicycle, and pedestrian access and circulation during each phase of construction.

n) A construction period parking management plan to ensure that parking demands for construction workers, site employees, and customers are accommodated during each phase of construction.

Thus, with the implementation of TRANS SCA 2 as part of the project, the Project would not result in a substantial, though temporary, adverse affect on the circulation system during construction of the project.

Changes in Air Traffic Patterns

The discussion of changes in air traffic patterns is based on application of Significance Threshold #17. The Oakland International Airport is located about eight miles south of the project site. The Project would increase density and increase building heights at the project site. However, building heights are not expected to interfere with current flight patterns of Oakland International Airport or other nearby airports. Therefore, the Project would not result in changes in air traffic patterns. The Project would result in a less-than-significant impact on air traffic patterns.

4.12.4 Planning-Related Non-CEQA Issues Discussion

The items discussed in this section include:

- Parking Considerations
- Truck Access and Circulation
- Transit Ridership
- Intersection Queuing Analysis

While these subjects do not relate to environmental impacts that are required to be evaluated under CEQA, they are discussed for informational purposes to aid the public and decision makers in evaluating and considering the merits of the project.

Parking for Bicycles and Automobiles

Bicycle Parking

City of Oakland Bicycle Parking Ordinance (Municipal Code Chapter 17.117) provides bicycle parking requirements for new facilities and additions to existing facilities. Two types of bicycle parking are required: long-term bicycle parking, which includes lockers or locked enclosures, and short-term bicycle parking, which includes bicycle racks.

Table 4.12-10 summarizes the bicycle parking supply as required by the Bicycle Parking Ordinance, which requires five long-term and 19 short-term spaces. The project would provide seven long-term and 30 short-term bicycle parking spaces, which would exceed the requirement for both long-term and short-term spaces.

TABLE 4.12-10
PROJECT REQUIRED BICYCLE PARKING

<table>
<tr><th rowspan="2">Land Use</th><th rowspan="2">Units</th><th colspan="2">Long-Term</th><th colspan="2">Short-Term</th></tr>
<tr><th>Spaces per Unit[a]</th><th>Spaces</th><th>Spaces per Unit[a]</th><th>Spaces</th></tr>
<tr><td>Supermarket</td><td>26.0 KSF</td><td rowspan="3">1:12 KSF</td><td rowspan="3">3</td><td rowspan="2">1:2 KSF</td><td rowspan="2">15</td></tr>
<tr><td>Restaurant</td><td>4.3 KSF</td></tr>
<tr><td>Retail</td><td>2.7 KSF</td><td>1:5 KSF</td><td>2</td></tr>
<tr><td>Bank</td><td>3.0 KSF</td><td>1:10 KSF</td><td>2</td><td>1:20 KSF</td><td>2</td></tr>
<tr><td>Total Required Bicycle Spaces</td><td></td><td></td><td>5</td><td></td><td>19</td></tr>
<tr><td>Total Bicycle Parking Provided [b]</td><td></td><td></td><td>7</td><td></td><td>30</td></tr>
<tr><td>Bicycle Parking Surplus</td><td></td><td></td><td>+2</td><td></td><td>+11</td></tr>
</table>

[a] Based on Oakland Municipal Code Section 17.117.10. The Municipal Code also requires minimum two spaces for each use.
[b] Based on project site plan dated July 26, 2013

SOURCE: Fehr & Peers, 2013.

The Oakland Bicycle Parking Ordinance addresses not only the quantity of parking, but the design and layout of that parking. Generally, long-term and short-term bicycle parking spaces are required to be located within 500 feet and 50 feet of the building entrance, respectively. The current project plans show that the long-term bicycle parking spaces would be provided in the ground-level garage near the driveway on 30th Street and short-term bicycle parking spaces would be provided along the Broadway frontage.

Because the Project would not provide more than 150,000 square feet of non-residential floor area, no shower or locker facilities are required per Municipal Code Chapter 17.117.130.

Recommendation TRANS-7: Although not required to address an adverse environmental impact, the following should be considered in regards to bicycle parking:

- Ensure that short-term and long-term bicycle parking spaces are consistent with *City of Oakland Bicycle Parking Rack Guidelines*.
- Ensure the short-term bicycle parking on sidewalks do not block pedestrian circulation.
- Ensure that some short-term bicycle parking spaces can accommodate bicycles with trailers.
- Monitor the usage of long-term and short-term bicycle parking spaces and if necessary provide additional parking spaces.

Automobile Parking

The evaluation includes the following:

- Comparison of the proposed parking supply to the City's parking requirements
- Comparison of the proposed parking supply to the estimated project demand, including an evaluation of the potential for shared parking
- Summary of strategies to reduce parking demand and/or increase supply

Project Parking Supply

The Project site currently provides 287 parking spaces, which are available to the general public. The proposed Project would provide 162 off-street parking spaces with 18 spaces on the ground level and 144 spaces on the roof-top level.

In addition, the Project would make the following changes to the on-street parking supply adjacent to the site, which will result in one net new on-street parking space:

- Gain of two new parking spaces on Broadway by eliminating existing curb-cuts
- Loss of one existing space on 30th Street

City Off-street Project Parking Requirements

A consideration when evaluating a project's parking supply is how it compares to the City's Municipal Code requirements for off-street parking (Municipal Code Chapter 17.116). This analysis applies the requirements for the CC-2 zone to the Project.

Table 4.12-11 summarizes parking supply as required by the Municipal Code. Based on the City's requirements, the Project would have a parking deficit of seven spaces.

However, the City of Oakland Bicycle Parking Ordinance allows up to a five percent reduction in the number of required automobile parking spaces if the bicycle parking supply exceeds the minimum requirements. The Bicycle Parking Ordinance allows for the automobile parking to be reduced by one space for six long-term or short-term bicycle parking space in excess of the minimum requirements. Since the project would provide 13 additional bicycle parking spaces, the automobile parking can be reduced by two spaces. The proposed project would have an automobile parking surplus of one space with the bicycle parking credit.

TABLE 4.12-11
PROJECT REQUIRED AUTOMOBILE PARKING

Land Use	Units	Spaces per Unit[a]	Required Parking Supply	Provided Parking Supply	Surplus/ Deficit
Supermarket	26.0 KSF	1:200 SF	130		
Restaurant	4.3 KSF	1:200 SF	21.4		
Bank	3.0 KSF	1:600 SF	5		
Retail	2.7 KSF	1:400 SF	6.75		
Total			**163**	**162**	**-1**
Reduction due to exceeding bicycle parking			**-2**		
Total Parking Required			**161**	**162**	**+1**

[a] Based on Oakland Municipal Code Section 17.116.080

SOURCE: Fehr & Peers, 2013.

Parking Demand Analysis

The parking supply provided for the Project is also measured against the expected parking demand for the proposed uses. Estimated parking demand for project is estimated based on data and methodology presented in the Fourth Edition of *Parking Generation* (ITE, 2010).

Existing Parking Demand. The project site is currently occupied by a parking lot that provides 287 parking spaces, which are available to the general public. Based on observations in 2013, the existing parking lot operates at about half capacity during business hours on most weekdays. The Project would eliminate the existing parking lot. It is estimated that most of the parking demand at the existing lot is generated by patients, visitors, employees the nearby Alta Bates and Kaiser Medical Centers who use this parking lot due to its lower cost than other parking facilities in the area. It is expected that the motorists using the existing parking lot would either divert to other parking facilities operated by the Medical Centers, or shift to other modes of travel.

Estimated Project Parking Demand. Table 4.12-12 summarizes parking demand for the Project. The parking demand estimate is based on the 85th percentile demand rate for urban sites where ITE is available. Overall, the Project is estimated to have a typical peak parking demand of 127 parking spaces on weekdays and 134 spaces on Saturdays. Because the site would provide 162 off-street parking spaces, the project would have a parking surplus of 35 spaces on weekdays and 28 spaces on Saturdays.

TABLE 4.12-12
PROJECT PARKING SUPPLY AND DEMAND

Land Use	Units [a]	ITE Code	Weekday	Saturday
Supermarket	26.0 KSF	850[b]	74	76
Restaurant	4.3 KSF	932[c]	27	35
Bank	3.0 KSF	912[d]	17	14
Retail	2.7 KSF	820[e]	9	9
Total Parking Demand			**127**	**134**
Parking Supply			**162**	**162**
Parking Surplus			**+35**	**+28**

[a] KSF = 1,000-square feet.
[b] ITE *Parking Generation (4th Edition)* land use category 850 (Grocery Store):
Weekdays: 85th percentile rate for urban supermarkets = 2.83 spaces per KSF.
Saturdays: ITE does not provide rates for urban supermarkets on Saturdays. The ratio of weekday 85th percentile rate for urban supermarkets to average rate for suburban supermarket was applied to the Saturday average rate for suburban supermarkets = 2.93 spaces per KSF.
[c] ITE *Parking Generation (4th Edition)* land use category 932 (High-Turnover [Sit-Down] Restaurant):
Weekdays: 85th percentile rate for urban restaurant = 6.37 spaces per KSF.
Saturdays: ITE does not provide rates for urban restaurants on Saturdays. The ratio of weekday 85th percentile rate for urban restaurants to average rate for suburban restaurant was applied to the Saturday average rate for suburban restaurants = 8.11 spaces per KSF.
[d] ITE *Parking Generation (4th Edition)* land use category 912 (Drive-in Bank):
Weekdays: 85th percentile rate for all sites = 5.67 spaces per KSF.
Saturdays: 85th percentile rate for all sites = 4.66 spaces per KSF.
[e] ITE *Parking Generation (4th Edition)* land use category 820 (Shopping Center):
Weekdays: 85th percentile rate for all sites (Non-December) = 3.16 spaces per KSF.
Saturdays: 85th percentile rate for all sites (Non-December) = 3.40 spaces per KSF.

SOURCE: Fehr & Peers, 2013.

The parking demand estimate presented in Table 4.12-12 is conservative because it assumes that parking demand for all uses at the site would peak at the same time and the demand is based on the 85th percentile rates as opposed to average rates. The actual parking demand for the project would depend on the specific uses occupying the site. Considering that retail demand in December is generally higher than other months of the year, it is expected that the Project would have a higher parking demand in December.

Parking Analysis Conclusions

Based on both City requirements and estimate of project parking demand, it is expected that the Project would provide adequate parking space to meet its peak demand during typical operations.

Recommendation TRANS-8: Although not required to address an adverse environmental impact, the following strategies, to further implement TRANS SCA 1, should be considered to reduce project parking demand and better manage the available parking supply:

- Limit parking on the ground level to ADA accessible spaces and short-term (20 minutes or less) parking.
- Limit most parking spaces on the roof-level to two hours or less so that they are available to project visitors and not used for commuter parking.
- Encourage employees to park on the roof-level furthest away from the elevators and in the compact parking spaces.
- Provide signage informing motorists in the ground level parking that additional parking is available on the roof-top.
- Install parking meters at all on-street parking spaces along the project frontage on Broadway and 30th Street and limit parking to one-hour or less.

The environmental consequences of each strategy listed above have been considered. It is not anticipated that their implementation would result in any significant CEQA impacts.

Truck Access and Circulation

City Municipal Code Section 17.116.140 requires off-street loading facilities for commercial uses. According to the code, total commercial uses providing less than 10,000 square feet of net floor area do not require any loading berths; uses between 10,000 and 24,999 square feet of net floor area require one loading berth, and uses between 25,000 and 49,999 square feet of net floor area require two loading berths.

The supermarket component of the Project would provide 26,000 square feet of space. Thus, it requires two loading berths. Based on the site plan, the Project would provide one loading berth, which would not meet the City‘s requirements for off-street loading facilities. The project applicant would seek a variance from this requirement. All other components of the Project combined would provide about 10,000 square feet of space, which does not require any loading berths. Because the Project would not provide any loading berths for these shops, the non-supermarket components of the Project would meet the City’s requirement.

The loading berth for the supermarket component of the Project would be located on the ground level in the northwest corner of the supermarket building. Delivery trucks would enter the project site through the 30th Street driveway and proceed to the back of the grocery store and back into the loading dock. Delivery trucks would exit the site by leaving through the Broadway driveway and turning right onto southbound Broadway.

Transit Ridership

One of the stated goals in City of Oakland General Plan LUTE is the promotion of transit ridership and encouragement of transit accessibility and improvement of transit service throughout Oakland. Thus, an increase in transit ridership is not identified as an adverse impact under CEQA.

This section analyzes the transit system with trips associated with the Project added to the existing system. This analysis presents the extent of impacts relative to existing transit conditions.

Because the Project primarily serves the local neighborhood and the nearest BART station, the 19th Street Station, is more than 0.8 mile away, it is expected to generate very few trips that would use BART. Thus, impacts of the Project on BART train occupancy and station gate capacity are expected to be minimal and are not further discussed.

AC Transit Ridership

It is estimated that the Project would generate about three AC Transit bus trips during the peak hours.[12] About 12 buses operate on Broadway adjacent to the project site during the peak hours. Thus, it is expected that ridership on buses in the project vicinity would increase by less than one rider per bus during the peak hours. This level of increase would not have a substantial effect on AC Transit operations.

Intersection Queuing Analysis

Environmental impacts of the Project on intersection traffic operations were analyzed through the delay/ LOS analysis presented earlier in this document. Although not an environmental impact, in addition, an analysis of Project's impacts on queuing at intersections was also completed to provide additional information to aid the public and decision makers in evaluating and considering the merits of the Project.

Queuing analysis for intersections in the project vicinity was completed for the Existing scenarios using the Synchro software. The software calculates the expected queue using a formula that extrapolates the length of queue based on two cycle lengths. This methodology provides reasonable results for locations operating in the LOS A through LOS D, but can misrepresent conditions as intersection operations approach capacity. In these instances, the software output denotes the condition with a letter/symbol adjacent to the analysis output worksheet.

Queuing impacts were identified where the Project trips would add 25 or more feet to the 95th percentile queue if the 95th percentile queue was over the available storage length with or without the project. **Table 4.12-13** presents queues at intersections adjacent to the project site and where the Project would increase queue length by 25 or more feet. **Appendix G, part B.8,** summarizes queues at all intersections in the study area.

12 Based on *Safeway Redevelopment Project: Broadway and Pleasant Valley Avenue Draft EIR* (published in January 2013), the existing Safeway shopping center has a one percent transit mode share during peak hours. Considering that similar to the Safeway Redevelopment project, the Project would be a retail development on Broadway with similar transit service, it is expected that the Project would have similar transit mode share.

The Project trips would add 25 or more feet to the 95th percentile queue at the following locations where the 95th percentile queue would be over the available storage length with or without the Project:

- 30th Street/Broadway Intersection (#7) – The Project would increase the eastbound queue at this intersection by more than 140 feet during the weekday PM peak hour, blocking the Project driveway on 30th Street. Because the intersection would operate at LOS B during the weekday PM peak hour, queues would clear at the end of each cycle allowing vehicles to turn into and out of the driveway.

TABLE 4.12-13
QUEUING SUMMARY

			Existing[b]		Existing Plus Project[b]	
Intersection	**Movement[a]**	**Storage (feet)**	**PM (feet)**	**SAT (feet)**	**PM (feet)**	**SAT (feet)**
7. 30th Street/Broadway						
	EB Thru	125	110	40	**#250**	120
	WB Thru	250	50	30	50	30
	NB Left	125	m10	10	20	20
	NB Thru	500	40	30	40	30
	SB Left	125	m40	20	m30	20
	SB Thru	800	210	100	210	110
10. 27th Street/Broadway						
	SB Left	75	90	80	**140**	100
13. 30th Street/Project Driveway						
	EB	125	-	-	< 20	< 20
	WB	60	-	-	< 20	< 20
	SB	N/A	-	-	40	40

NOTES: **Bold** indicates where project would increase queues by more than 25 feet and queues would be longer than available storage.

a NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound.
b 95th Percentile queue as estimated by Synchro for weekday PM and Saturday peak hours. Only movements where queue would increase by more than 25 feet are reported.

# = 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m = Volume for 95th percentile queue is metered by upstream signal.

SOURCE: Fehr & Peers, 2013.

- 27th Street/Broadway intersection (#10) – The Project would increase the southbound left queue at this intersection by about 50 feet during the weekday PM peak hour. The queue would exceed the available storage space regardless of the Project.

While not required to address a CEQA impact, the following recommendation, which will be imposed as a Condition of Approval, would improve safety in the vicinity of the Project.

Recommendation TRANS-9: Implement the following measures to minimize queues on the eastbound 30th Street approach at the 30th Street/Broadway intersection:

- Adjust signal timing parameters at the intersection to provide more green time for the east/west movements.

- In coordination with Recommendations TRANS-5 and TRANS-6, consider providing a right-turn lane on eastbound 30th Street at Broadway. This may require elimination of one or more on-street parking spaces on 30th Street.

4.12.5 References

Alameda County Transportation Commission (ACTC), 2013. *2012 Level of Service Monitoring Report*, January 2013.

Bay Area Rapid Transit (BART), Monthly Ridership Report, October 2012, available online at: www.bart.gov/about/reports/ridership.aspx, accessed October 2012.

California Department of Transportation (Caltrans), 2012a. *2011 Traffic Volumes on California State Highways*; at traffic-counts.dot.ca.gov/2011TrafficVolumesAug2012.pdf; accessed May 2013.

California Department of Transportation (Caltrans), 2012b. California Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, Part 4: Highway Traffic Signals, Chapter 4C: Traffic Control Signal Needs Studies. Available online at: www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/pdf/camutcd/CAMUTCD-Part4.pdf; accessed December 10, 2012.

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City of Oakland, *Envision Oakland, City of Oakland General Plan, Land Use and Transportation (LUTE) Element*, as amended through March 24, 1998.

City of Oakland, *Bicycle Master Plan Update*, December 2007.

City of Oakland, *Pedestrian Master Plan*, November 2002.

Transportation Research Board (TRB), *Highway Capacity Manual*, 1985.

Transportation Research Board (TRB), *2000 Highway Capacity Manual*, 2000.

4.13 Utilities and Service Systems

This section describes existing public utilities in the project vicinity and evaluates the impact of the Project on the provision of public utilities and service systems. Topics analyzed in this section include public water supply, sanitary sewer (wastewater), stormwater drainage facilities, solid waste, and energy services. This section describes the environmental and regulatory setting, and relevant utilities and service systems in the project vicinity. Potential impacts are discussed and evaluated, and appropriate mitigation measures or Standard Conditions of Approval (SCA) are identified, as necessary.

4.13.1 Environmental Setting

Water Service

Water Supply System

The East Bay Municipal Utility District (EBMUD) is a publicly owned water utility supplying water and wastewater treatment for parts of western Alameda and Contra Costa Counties, including the project site. The 627-square-mile Mokelumne River watershed is the major water source for EBMUD, with the source of water originating in the Sierra Nevada Mountains of eastern California. The watershed of this river collects snowmelt from the western slope of the Sierra Nevada in Alpine, Amador, and Calaveras counties. Water from the river is collected at the Pardee Dam and Reservoir, located 38 miles northeast of Stockton near the town of Jackson. A portion of the water stored in Pardee Reservoir is conveyed to the EBMUD service area via the Mokelumne Aqueducts. The remainder of the water is released into the nearby Camanche Reservoir. EBMUD has water rights and contracts for up to 325 million gallons per day (mgd) from the Mokelumne River, but the precise amount of this entitlement available in any given year is dependent on a range of variables.

In addition, EBMUD has been recycling water at its main wastewater treatment facility since the early 1970s. Its existing and committed inventory of recycled water projects were estimated to generate 9.3 mgd of recycled water in 2010 (EBMUD, 2012a).

The East Bayshore Recycled Water Project, currently under construction, will use water treated in EBMUD's wastewater treatment plant (see Sanitary Sewer Service, below) and supply an annual average of 2.2 mgd of recycled water to portions of Alameda, Albany, Berkeley, Emeryville, and Oakland. Recycled water will be used for irrigation, industrial, and commercial activities and possibly wetland restoration projects and will offset demands for potable water supply. The first customers received deliveries in 2008 and in fiscal year 2011, the project delivered recycled water to offset the need for more than 30 million gallons of drinking water (EBMUD, 2011b). The closest available recycled water connection to the project site is approximately 1 mile southwest at the intersection of 14th Street and San Pablo Avenue (City Hall Plaza) (BKF, 2012a).

There are six water treatment plants in the EBMUD water supply and distribution system. Combined, the six plants have a treatment capacity of over 375 mgd (EBMUD, 2011c). Potable water to the project site is supplied by the Orinda Water Treatment Plant and treats water through coagulation, filtration, and disinfection (BKF, 2012a).

Water Demand

EBMUD's *2010 Urban Water Management Plan* (UWMP) was adopted by the EBMUD Board of Directors on June 28, 2011 to assess current and projected water usage, water supply planning, water conservation, and recycling programs over a 20-year planning horizon. The UWMP sets minimum performance goals for water supply in the service area including reliability, flexibility, and the minimization of water rationing. Key components of the UWMP are water conservation and recycling. According to the UWMP, the projected water demand in 2010 was 216 mgd and is anticipated to increase to 229 mgd in 2030. This projection assumes that the existing EBMUD water conservation program would reduce annual demand by 56 mgd and the water recycling program would decrease water demand by 19 mgd (EBMUD, 2011a).

On April 24, 2012, EBMUD adopted the *Water Supply Management Program 2040 Plan* (WSMP). The WSMP is a program-level effort that estimates EBMUD's dry-year water supply needs through 2040 and anticipates 50 mgd of future supply being provided by water conservation and recycling. The demand for water in the EBMUD's service area is projected to increase to 247 mgd by 2040 under a 15 percent maximum customer rationing scenario (EBMUD, 2012a).

Sanitary Sewer Service

Sanitary Sewer Conveyance

The City of Oakland is responsible for operation and maintenance of the local sanitary sewer collection system at the project site, while EBMUD is responsible for operation and maintenance of interceptor lines and the treatment of sewage. The City's sewer collection system includes over 1,000 miles of pipes ranging in size from 6-inches to 72-inches, as well as seven pump stations. Local collection lines within the project vicinity range in size from 8- to 12-inches. The collection system is separated into basins and sub-basins, with the project site located within Basin 52 and sub-basin 5209 (BKF, 2012a). The sub-basin encompasses a specific physical area. Its sewer flows are assigned to a single discharge point from the City's collection system into EBMUD's interceptor lines.

The City has instituted an Inflow and Infiltration (I&I) Correction Program to reduce wet weather overflows into the sanitary sewer system. This program is anticipated to increase the capacity of the collection system to allow an approximately 20 percent increase in wastewater flows for each subarea within the City.

In 1986, the City completed a Sewer System Evaluation Survey (SSES) for North Oakland, which included the project site. The SSES identified improvements needed to reduce I&I and provide additional capacity for wastewater flows. These improvements included repair of fractured sewer pipes/manholes and removal of unpermitted storm drain connections. The City has indicated that I&I improvements to the sewer system have been completed for Basin 52 (BKF, 2012a).

There have been no existing collection system capacity issues or other reports of deficiencies for existing trunk lines within and downstream of the project site (BKF, 2012a).

Sanitary Sewer Treatment

EBMUD provides sanitary sewer treatment services to approximately 655,000 people within an 83-square-mile area of Alameda and Contra Costa counties, including the City of Oakland (also known as Special District No.1). EBMUD's collection system includes approximately 29 miles of interceptor pipeline and 15 pump stations. EBMUD's Main Wastewater Treatment Plant is located southwest of the Interstate 580/Interstate 80 interchange in Oakland, adjacent to the San Francisco/Oakland Bay Bridge approach. The plant is designed to provide primary treatment for up to 320 mgd and secondary treatment for a maximum flow of 168 mgd. Average daily flow is 73 mgd (EBMUD, 2012b).

Stormwater Drainage Facilities

Stormwater runoff in Oakland is collected from the southwesterly flows from the Oakland/Berkeley hills to the developed flatlands, where it then flows primarily through underground storm drains and culverts to the San Francisco Bay via the Oakland Estuary (directly or by way of Lake Merritt) or through the City of Emeryville. The project vicinity generally slopes from northwest to southeast and is largely covered with impervious surfaces (buildings and pavement) with the majority of runoff draining overland to curbside inlets that enter the City's piped storm drainage system. Storm drainage from the project vicinity generally flows south and east, eventually discharging into the Glen Echo Creek system and Lake Merritt.

The Project is located in the Rockridge and Glen Echo Creeks watershed. The City of Oakland is responsible for operation and maintenance of the local storm drainage system within the project vicinity while the Alameda County Flood Control and Water Conservation District (ACFCWCD) is responsible for portions of Glen Echo Creek and other major creeks and flood control channels generally downstream of the City's storm drain facilities.

In 2006, the City completed a comprehensive inventory and assessment of the storm drain infrastructure, the Storm Drainage Master Plan (SDMP). According to this report, the City's storm drainage infrastructure is nearing the end of its useful life cycle and is generally in poor condition, primarily due to inadequate resources to keep up with required improvements. The SDMP states that demand and burden on the system have increased due to infill development and that normal storm events as well as El Nino-type events have led to increasing instances of flooding, erosion, and property damage.

The SDMP identifies a Capital Improvement Project (CIP) within the project vicinity to increase the capacity of 622 linear feet of storm drain line in 26th Street between Broadway and 27th Street in order to alleviate hydraulic grade line issues. The SDMP proposes upsizing an existing 30-inch storm drain to 48-inches that would need to tie-in with an existing hydrodynamic separator unit at the downstream reach prior to connecting to the culverted portion of Glen Echo Creek at 27th Street. The City has indicated that funding is not currently available to begin the required improvements (BKF, 2012a).

In 2002, ACFCWCD completed improvements to Glen Echo Creek between 28th and 29th Streets, which included rehabilitation of the culvert and replacement of piping. These improvements, known as Phase 1, removed flow restrictions to the creek that caused occasional winter flooding at 30th Street and Richmond Boulevard, approximately two blocks east of the project site. ACFCWCD also has plans for Phase 2 improvements that include increasing channel capacity and restoration of the greenbelt from 29th Street to Frisbie Street. However, based on discussions with City of Oakland Public Works Agency staff, Phase 2 is currently on hold since Phase 1 has so far successfully resolved flooding (BKF, 2012a).

Solid Waste

Waste Management and Disposal

Non-hazardous waste in the City of Oakland is collected by Waste Management of Alameda County (WMAC), which provides curbside pickup for residential, commercial and industrial non-hazardous waste, and transports it to WMAC’s Davis Street Transfer Station in the City of San Leandro. Transfer trucks haul waste to the Altamont Landfill and Resource Facility, located approximately 35 miles east of Oakland near Livermore. In 2011, the City of Oakland disposed of approximately 292,295 tons of solid waste, 237,935 tons of which went to the Altamont Landfill (CalRecycle, 2013a). Most of the remaining solid waste was sent to one of four landfills: Forward Landfill in San Joaquin County, the Keller Canyon Landfill in Contra Costa County, Potrero Hills Landfill in Solano County, and the Vasco Road Landfill in Alameda County. The Altamont Landfill has a maximum permitted capacity of 62,000,000 cubic yards. As of 2005, 74 percent of this capacity was remaining (CalRecycle, 2013b).

Alameda County’s Integrated Waste Management Plan, prepared by the Alameda County Waste Management Authority pursuant to Assembly Bill 939 (see below), projects an expected closure for the Vasco Road Landfill in 2022 and the Altamont Landfill in 2040 (ACWMA, 2011).

Waste Generation and Diversion

Assembly Bill (AB) 939 (discussed under the Regulatory Setting, below), specifies a required diversion rate of at least 50 percent of wastes by the year 2000, and at least 75 percent by 2010. The California Department of Resources Recycling and Recovery (CalRecycle) indicates that Oakland’s diversion rate was 59 percent in 2006. Beginning with the 2007 jurisdiction annual reports, diversion rates were no longer measured. With the passage of Senate Bill (SB) 1016 in 2006, the Per Capita Disposal Measurement System, only per capita disposal rates are measured to determine if a jurisdiction’s efforts are meeting the intent of AB 939. In 2011, Oakland had a per resident disposal target rate of 5.8 pounds per day (PPD) and a per employee disposal target rate of 15.3 PPD. In 2011, the City reported an actual annual per resident PPD of 4.1 and 10.0 PPD per employee, thereby meeting the City's waste diversion goals for 2011 (CalRecycle, 2013c).

Energy Services

Electricity and gas service in the City of Oakland is provided primarily by Pacific Gas and Electric (PG&E), which owns the gas and electrical utility supply lines. Some users purchase energy services directly from alternate power providers. Other companies may also provide electricity, but PG&E delivers the service. Throughout most of Oakland, electrical power is delivered via overhead distribution and transmission lines, and natural gas is distributed through underground piping. PG&E expands its services on an as-needed basis and requires the user to fund the extension of service.

The majority of the electrical infrastructure in the project vicinity consists of 12-kilovolt (kV) transmission lines from the PG&E substation located in 21st Street west of Telegraph Avenue. The substation receives 155 kV and transmits electrical power to both the Upper Downtown and West Oakland areas. Existing gas lines within the project vicinity include low pressure lines and semi-high pressure lines that range in size from 2- to 24- inches (BKF, 2012a).

4.13.2 Regulatory Setting

Water Quality, Supply, and Distribution

Safe Drinking Water Act

The USEPA administers the Safe Drinking Water Act (SDWA), the primary federal law that regulates the quality of drinking water and establishes standards to protect public health and safety. The Department of Health Services (DHS) implements the SDWA and oversees public water system quality statewide. DHS establishes legal drinking water standards for contaminates that could threaten public health.

Senate Bill (SB) 610 / Senate Bill (SB) 221

Senate Bill (SB) 610, codified as Sections 10910-10915 of the California Public Resources Code, requires local water providers to conduct a water supply assessment for projects proposing over 500 housing units[1], 250,000 square feet of commercial office space (or more than 1,000 employees), a shopping center or business establishment with over 500,000 square feet (or more than 1,000 employees), or equivalent usage. The Project does not meet these criteria.

Water Conservation in Landscaping Act (Assembly Bill 1881, 2006)

The Water Conservation in Landscaping Act of 2006 (Assembly Bill 1881, Laird) requires cities, counties, and charter cities and charter counties to adopt landscape water conservation ordinances by January 1, 2010. Pursuant to this law, the Department of Water Resources (DWR) has

[1] Senate Bill (SB) 221 similarly amended the Subdivision Map Act to ensure confirmation that public water supply is sufficient to serve proposed development projects of 500 dwelling units or more.

prepared a Model Water Efficient Landscape Ordinance (Model Ordinance) for use by local agencies. Most new and rehabilitated landscapes are subject to a water efficient landscape ordinance. Public landscapes and private development projects are subject to the Model Ordinance. However, the Ordinance does not apply to registered local, state, or federal historic sites, ecological restoration projects, mined-land reclamation projects, or plant collections.

Stormwater Drainage

Regulations related to the quality and quantity of stormwater runoff (i.e., Federal Clean Water Act / NPDES) are discussed in Section 4.8, *Hydrology and Water Quality* of this EIR.

Solid Waste

Assembly Bill (AB) 939

AB 939, enacted in 1989 and known as the Integrated Waste Management Act, required each city and/or county to prepare a Source Reduction and Recycling Element to demonstrate reduction in the amount of waste being disposed to landfills, with diversion goals of 50 percent by the year 2000. Diversion includes waste prevention, reuse, and recycling. As mentioned in the Environmental Setting, SB 1016 revised the reporting requirements of AB 939 by implementing a per capita disposal rate based on a jurisdiction's population (or employment) and its disposal. The 50 percent equivalent per capita disposal target is the average amount of disposal a jurisdiction would have had during 2003 to 2006 if it had been exactly at a 50 percent diversion rate.

Assembly Bill (AB) 341

Assembly Bill (AB) 341, enacted in 2011 applies to businesses generating four or more cubic yards of garbage per week, and to multi-family residential buildings with five or more units. Effective July 1, 2012, requires affected businesses and multi-family property owners to have recycling service sufficient to handle the amount of recyclable material produced at their business or property.

Alameda County Waste Reduction and Recycling Initiative (Measure D)

In addition to AB 939, the 1990 voter initiative Measure D (Alameda County Waste Reduction and Recycling Initiative) mandates Alameda County to divert 75 percent of its solid waste from landfills by the year 2010.

Alameda County Ordinance Prohibiting the Landfill Disposal of Plant Debris (Ordinance 2008-01)

Ordinance 2008-01 was enacted in 2009 and applies to businesses or organizations generating significant amounts of plant debris, and that hauls the material to Alameda County disposal facilities, or places the material in bins for collection. Affected businesses and organizations include but are not limited to: residential landscapers and gardeners; commercial landscapers and gardeners; commercial and residential property managers; municipalities and institutions (e.g.

colleges, hospitals); and businesses subscribing to 4 cubic yards or more of weekly solid waste collection service.

Alameda County Mandatory Recycling Ordinance (Ordinance 2012-01)

Ordinance 2012-01 was enacted in 2012 and applies to businesses generating four or more cubic yards of garbage per week, and to multi-family residential buildings with five or more units. Phase 1 of the ordinance, effective July 1, 2012, requires affected businesses and multi-family property owners to have recycling service sufficient to handle the amount of recyclable material produced at their business or property. This includes paper, cardboard, and recyclable food and beverage glass containers, aluminum and metal containers, and HDPE and PET plastic bottles. Phase 2 of the ordinance, effective July 1, 2014, will add food and compostable papers to the materials covered in Phase 1.

Construction and Demolition (C&D) Debris Waste Reduction and Recycling Ordinance (Oakland Municipal Code 15.34)

The City of Oakland's Construction and Demolition (C&D) Ordinance is intended to further the goals of AB 939 and Alameda County's Measure D. The C&D Ordinance affects the following projects:

- All New Construction;
- All Alterations, Renovations, Repairs, or Modifications with construction value of $50,000 or greater, excluding R-3;
- All Demolition, including Soft Demo, and excluding R-3;

Applicants must complete a Waste Reduction and Recycling Plan (WRRP) as part of the Building Permit Application process to detail the plan for salvaging and recycling C&D debris generated during the course of the project. Standards current at the time of this writing call for salvage and/or recycling 100 percent of asphalt and concrete, and at least 65 percent of all remaining debris. These rates are subject to administrative adjustment and Applicants must follow the standards published at the time of building permit application.

The City will not issue an affected permit without an approved WRRP on file.

Upon approval of the WRRP and issuance of the permit(s), the Applicant shall execute the plan. Prior to the Final Inspection, Temporary Certificate of Occupancy or Certificate of Occupancy, the Applicant must complete and obtain approval of a Construction and Demolition Summary Report (CDSR). The CDSR documents the salvage, recycling and disposal activities that took place during the project. The CDSR must include documentation, such as scale tickets, that support the data provided in the CDSR.[2]

[2] More details are available at: http://www2.oaklandnet.com/Government/o/PWA/o/FE/s/GAR/OAK024368.

Energy

Buildings constructed after June 30, 1977, must comply with standards identified in Title 24 of the California Code of Regulations. Title 24, established by the California Energy Commission (CEC) in 1978, requires the inclusion of state-of-the-art energy conservation features in building design and construction including the incorporation of specific energy conserving design features, use of non-depletable energy resources, or a demonstration that buildings would comply with a designated energy budget.

Local Plans and Policies

City of Oakland General Plan

The Oakland General Plan includes the following policy related to the provision of utilities and infrastructure:

- ***Policy I/C 1.9:*** Adequate public infrastructure should be ensured within existing and proposed industrial and commercial areas to retain viable uses, improve the marketability of existing, vacant or underutilized sites, and encourage future use and development of these areas with activities consistent with the goals of the *General Plan.*

City of Oakland Standard Conditions of Approval and Uniformly Applied Development Standards Imposed as Standard Conditions of Approval

The City's Standard Conditions of Approval (SCA) relevant to reducing impacts on utilities and service systems and that apply the Project are listed below. If the Project is approved by the City, all applicable SCAs would be adopted as conditions of approval and required, as applicable, of the Project to help ensure less-than-significant impacts to utilities. Because the conditions of approval are incorporated as part of the Project, they are not listed as mitigation measures.

- **UTIL SCA 1: Waste Reduction and Recycling**

  The project applicant will submit a Construction and Demolition WRRP and an Operational Diversion Plan (ODP) for review and approval by the Public Works Agency.

  Chapter 15.34 of the Oakland Municipal Code outlines requirements for reducing waste and optimizing construction and demolition recycling. Affected projects include:

  - All New Construction;
  - All Alterations, Renovations, Repairs, or Modifications with construction value of $50,000 or greater, excluding R-3;
  - All Demolition, including Soft Demo, and excluding R-3;

  Applicants must complete a Waste Reduction and Recycling Plan (WRRP) as part of the Building Permit Application process to detail the plan for salvaging and recycling C&D debris generated during the course of the project. Standards current at the time of this writing call for salvage and/or recycling 100% of asphalt and concrete, and at least 65% of all remaining debris. These rates are subject to administrative adjustment and Applicants must follow the standards published at the time of building permit application. The City will not issue an affected permit without an approved WRRP on file.

Upon approval of the WRRP and issuance of the permit(s), the Applicant shall execute the plan. Prior to the Final Inspection, Temporary Certificate of Occupancy or Certificate of Occupancy, the Applicant must complete and obtain approval of a Construction and Demolition Summary Report (CDSR). The CDSR documents the salvage, recycling and disposal activities that took place during the project. The CDSR must include documentation, such as scale tickets, that support the data provided in the CDSR. Additional information is available at: http://www2.oaklandnet.com/Government/o/PWA/o/FE/s/GAR/OAK024368

The ODP will identify how the project complies with the Recycling Space Allocation Ordinance, (Chapter 17.118 of the Oakland Municipal Code), including capacity calculations, and specify the methods by which the development will meet the current City recycling standards for materials generated by operation of the proposed project. The proposed program shall be in implemented and maintained for the duration of the proposed activity or facility, and conform with the requirements of the Alameda County Mandatory Recycling Ordinance. Any incentive programs shall remain fully operational as long as residents and businesses exist at the project site.

- **UTIL SCA 2: Stormwater and Sewer**

  Confirmation of the capacity of the City's surrounding stormwater and sanitary sewer system and state of repair shall be completed by a qualified civil engineer with funding from the project applicant. The project applicant shall be responsible for the necessary stormwater and sanitary sewer infrastructure improvements to accommodate the proposed project. In addition, the applicant shall be required to pay additional fees to improve sanitary sewer infrastructure if required by the Sewer and Stormwater Division. Improvements to the existing sanitary sewer collection system shall specifically include, but are not limited to, mechanisms to control or minimize increases in infiltration/inflow to offset sanitary sewer increases associated with the proposed project. To the maximum extent practicable, the applicant will be required to implement Best Management Practices to reduce the peak stormwater runoff from the project site. Additionally, the project applicant shall be responsible for payment of the required installation or hook-up fees to the affected service providers.

- **UTIL SCA 3: Compliance with the Green Building Ordinance**

  Prior to issuance of a demolition, grading, or building permit. The applicant shall comply with the requirements of the California Green Building Standards (CALGreen) mandatory measures and the applicable requirements of the Green Building Ordinance, OMC Chapter 18.02.

  a) The following information shall be submitted to the Building Services Division for review and approval with the application for a building permit:

     i. Documentation showing compliance with Title 24 of the 2008 California Building Energy Efficiency Standards.

     ii. Completed copy of the final green building checklist approved during the review of the Planning and Zoning permit.

     iii. Copy of the Unreasonable Hardship Exemption, if granted, during the review of the Planning and Zoning permit.

iv. Permit plans that show, in general notes, detailed design drawings, and specifications as necessary, compliance with the items listed in subsection (b) below.

v. Copy of the signed statement by the Green Building Certifier approved during the review of the Planning and Zoning permit that the project complied with the requirements of the Green Building Ordinance.

vi. Signed statement by the Green Building Certifier that the project still complies with the requirements of the Green Building Ordinance, unless an Unreasonable Hardship Exemption was granted during the review of the Planning and Zoning permit.

vii. Other documentation as deemed necessary by the City to demonstrate compliance with the Green Building Ordinance.

b) The set of plans in subsection (a) shall demonstrate compliance with the following:

i. CALGreen mandatory measures.

ii. All pre-requisites per the LEED / GreenPoint Rated checklist approved during the review of the Planning and Zoning permit, or, if applicable, all the green building measures approved as part of the Unreasonable Hardship Exemption granted during the review of the Planning and Zoning permit.

iii. [Insert green building point level/certification requirement: (See Green Building Summary Table)] per the appropriate checklist approved during the Planning entitlement process.

iv. All green building points identified on the checklist approved during review of the Planning and Zoning permit, unless a Request for Revision Plan-check application is submitted and approved by the Planning and Zoning Division that shows the previously approved points that will be eliminated or substituted.

v. The required green building point minimums in the appropriate credit categories.

During construction. The applicant shall comply with the applicable requirements CALGreen and the Green Building Ordinance, Chapter 18.02.

a) The following information shall be submitted to the Building Inspections Division of the Building Services Division for review and approval:

i. Completed copies of the green building checklists approved during the review of the Planning and Zoning permit and during the review of the building permit.

ii. Signed statement(s) by the Green Building Certifier during all relevant phases of construction that the project complies with the requirements of the Green Building Ordinance.

iii. Other documentation as deemed necessary by the City to demonstrate compliance with the Green Building Ordinance.

After construction, as specified below. Within sixty (60) days of the final inspection of the building permit for the project, the Green Building Certifier shall submit the appropriate documentation to Build It Green / Green Building Certification Institute and attain the minimum certification/point level identified in subsection (a) above. Within one year of the final inspection of the building permit for the project, the applicant shall submit to the Planning and Zoning Division the Certificate from the organization listed above demonstrating certification and compliance with the minimum point/certification level noted above.

- **UTIL SCA 4: Compliance with the Green Building Ordinance for Building and Landscape Projects**

  Prior to issuance of a building permit. The applicant shall comply with the requirements of the California Green Building Standards (CALGreen) mandatory measures and the applicable requirements of the Green Building Ordinance, (OMC Chapter 18.02.) for projects using the StopWaste.Org Small Commercial or Bay Friendly Basic Landscape Checklist.

  a) The following information shall be submitted to the Building Services Division for review and approval with application for a Building permit:

     i. Documentation showing compliance with the 2008 Title 24, California Building Energy Efficiency Standards.

     ii. Completed copy of the green building checklist approved during the review of a Planning and Zoning permit.

     iii. Permit plans that show in general notes, detailed design drawings and specifications as necessary compliance with the items listed in subsection (b) below.

     iv. Other documentation to prove compliance.

  b) The set of plans in subsection (a) shall demonstrate compliance with the following:

     i. CALGreen mandatory measures.

     ii. All applicable green building measures identified on the StopWaste.Org checklist approved during the review of a Planning and Zoning permit, or submittal of a Request for Revision Plan-check application that shows the previously approved points that will be eliminated or substituted.

  During construction. The applicant shall comply with the applicable requirements of CALGreen and Green Building Ordinance, Chapter 18.02 for projects using the StopWaste.Org Small Commercial or Bay Friendly Basic Landscape Checklist.

  a) The following information shall be submitted to the Building Inspections Division for review and approval:

     i. Completed copy of the green building checklists approved during review of the Planning and Zoning permit and during the review of the Building permit.

     ii. Other documentation as deemed necessary by the City to demonstrate compliance with the Green Building Ordinance.

SCAs related to hydrology and water quality, including those related to stormwater, are described in Section 4.8, *Hydrology and Water Quality* of this document.

4.13.3 Impacts and Mitigation Measures

Significance Criteria

The Project would have a significant impact on the environment if it were to:

1. Exceed wastewater treatment requirements of the San Francisco Bay Regional Water Quality Control Board;

2. Require or result in construction of new stormwater drainage facilities or expansion of existing facilities, construction of which could cause significant environmental effects;

3. Exceed water supplies available to serve the project from existing entitlements and resources, and require or result in construction of water facilities or expansion of existing facilities, construction of which could cause significant environmental effects;

4. Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the providers' existing commitments and require or result in construction of new wastewater treatment facilities or expansion of existing facilities, construction of which could cause significant environmental effects;

5. Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs and require or result in construction of landfill facilities or expansion of existing facilities, construction of which could cause significant environmental effects;

6. Violate applicable federal, state, and local statutes and regulations related to solid waste;

7. Violate applicable federal, state and local statutes and regulations relating to energy standards; or

8. Result in a determination by the energy provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the providers' existing commitments and require or result in construction of new energy facilities or expansion of existing facilities, construction of which could cause significant environmental effects.

Approach to Analysis

The potential effects of the Project on existing utility and service systems were considered based on the Project's resulting increases in population and land use intensity and were evaluated based on information regarding the various utilities agencies with jurisdiction over the project site, and the service capabilities of those agencies.

Impacts

Water Supply

Impact UTIL-1: The water demand generated by the Project would not exceed water supplies available from existing entitlements and resources (Criterion 3). (Less than Significant)

The projected water demand in the EBMUD service area in 2010 was 216 mgd and is anticipated to increase to 229 mgd in 2030. This projection assumes that the existing EBMUD water conservation program would reduce annual demand by 56 mgd and the water recycling program would decrease water demand by 19 mgd (EBMUD, 2011a). The demand is projected to increase to 247 mgd by 2040 under a 15 percent maximum customer rationing scenario (EBMUD, 2012a). The Project is estimated to demand approximately 1.9 mgd of water, based on a comparable Sprout's store operating in Sunnyvale, California (Schneider Electric, 2013)

As discussed under the Drought Management Program of the UWMP, EBMUDs system storage generally allows it to continue serving its customers during dry-year events. Despite water savings from EBMUD's conservation and recycling programs and rationing of up to 15 percent, additional supplemental supplies would be needed during a multi-year drought. The UWMP also identified a variety of projects for providing supplemental supplies that will allow EBMUD to meet water demand in the future.

Pressure and flow data provided by EBMUD indicates that there is adequate system wide pressure and flow capacity. Based on this data, the Project would not require expansion of existing water delivery facilities. Because the Project would require new building service connections, the Project would upgrade any existing 4-inch and 6-inch distribution lines to ensure the minimum fire flow for compliance with the California Fire Code and to address fire flow issues identified by the Oakland Fire Department (BKF, 2012a).

No recycled water system improvements are proposed at the project site since the closest available service is approximately 1 mile southwest at the intersection of 14th Street and San Pablo Avenue (City Hall Plaza).

In conclusion, the Project would not require new water supply entitlements, resources, facilities, or expansion of existing facilities beyond that which is already planned for in EBMUD's water supply planning analyses, and the impact would be less than significant.

Mitigation: None required.

Sanitary Sewer

Impact UTIL-2: The Project would not exceed the wastewater treatment requirements of the San Francisco Regional Water Quality Control Board or result in a determination that new or expanded wastewater treatment facilities would be required (Criteria 1 and 4). (Less than Significant)

The Project would increase the amount of wastewater generated within the project vicinity. Approximately 138,468 gpd of wastewater is currently generated in the project vicinity (BKF, 2012a). As discussed above, EBMUD's Main Wastewater Treatment Plant is currently operating at approximately 43 percent of its 168 mgd secondary treatment capacity (EBMUD, 2012b). The Project is estimated to increase wastewater generation (base sewer flow) to approximately 4,775 gpd (and 19,815 mgd wet weather peak flow) - or an increase of 2,860 gpd (BKF, 2012b). Therefore, expansion of existing treatment facilities would not be required.

In terms of wastewater flow conveyance to EBMUD treatment facilities, the Project would not require localized investment in new or upgraded local City-owned sanitary sewer infrastructure, or in the larger EBMUD-owned sanitary sewer transmission infrastructure. The City has commented that the sub-basin in which the project site is located (5209), as well as the other sub-basins in the project vicinity (5205, 5206, 5210, and 5211), either individually or combined, do not have enough capacity to serve additional sewer capacity demand. Therefore, the City has estimated a sewer mitigation (fee) that is included as part of the infrastructure costs for the I&I rehabilitation improvements. This fee represents the proportional share of improvement costs associated with within other basins to reallocate basin capacity to Basin 52 (BKF, 2012a). The Project proposes two 8-inch laterals from the 14-inch line in Broadway (BKF, 2012b).

Further, implementation of UTIL SCA 2, *Stormwater and Sewer*, would require the Project to construct any necessary sanitary sewer infrastructure improvements, the environmental impacts of which are discussed in this document. However, the Project would not require or result in the construction of new wastewater treatment facilities or expansion of existing treatment facilities because EBMUD has adequate capacity to treat the projected demand of the Project in addition to its existing commitments. The Project would have a less-than-significant impact on sanitary sewer service and treatment.

Mitigation: None required.

Stormwater Drainage Facilities

Impact UTIL-3: The Project would not require or result in construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects (Criteria 2). (Less than Significant)

The Project is located within a built-out urban environment, much of the area consists of impervious surfaces. The City of Oakland Storm Drainage Design Guidelines require the post-project peak discharge rate be maintained at a level less than or equal to the pre-project peak discharge. To the extent possible, the City has set a goal of reducing the peak runoff into the City's storm drains by 25 percent. Given the project site is currently 100 percent paved, the proposed Project is expected to decrease storm drain runoff. For the Project to meet the City's goal of reducing peak runoff by 25 percent, it proposes to incorporate increased pervious area through use of permeable pavers and storm water bioretention planting areas and biofiltration planters, as shown in the landscape plan in Figures 3-9 and 3-10 in Chapter 3, *Project Description*. Each of these approaches is consistent with the approaches recommended by the City of Oakland Environmental Services Division (BKF, 2012). The Project proposes approximately 3,736 square feet of stormwater treatment area on the site, which exceeds the amount of total treatment area required (approximately 3,036 square feet, based on the site's drainage area) by approximately 18 percent (or approximately 700 square feet) (BKF, 2013).

The Project will implement UTIL SCA 2, *Stormwater and Sewer*, and construct any necessary stormwater infrastructure improvements, the environmental impacts of which are discussed in this document; HYD SCA 2, *Post-construction Stormwater Pollution Prevention Plan*, to comply with Provision C.3 of the Alameda Countywide Clean Water Program to regulate post-construction stormwater runoff; and HYD SCA 1, *Stormwater Pollution Prevention Plan* (see Section 4.8, *Hydrology and Water Quality*).

Because the Project would not result in an increase in stormwater runoff, and would be required to meet the SCA listed above, it would have a less-than-significant impact on storm drainage facilities.

Mitigation: None required.

Solid Waste Services

Impact UTIL-4: Te Project would not violate applicable federal, state, and local statutes and regulations related to solid waste; nor generate solid waste that would exceed the permitted capacity of the landfills serving the area (Criteria 5 and 6). (Less than Significant)

The Project would generate construction/demolition debris, and the site population increase associated with the Project would increase demand for recycling and solid waste services. The Project would generate approximately 156.20 tons of operational solid waste annually that would go to the landfill (SCAQMD, 2011).

As stated above in the Environmental Setting, the Altamont Landfill is projected to have capacity through 2040. Moreover, the Project would not impede the ability of the City to meet waste diversion requirements or cause the City to violate other applicable federal, state, and local statutes and regulations related to solid waste. In addition, the Project would be required to implement UTIL SCA 1, *Waste Reduction and Recycling*, which requires the preparation of an

Operational Diversion Plan to identify how projects would comply with the City's Recycling Space Allocation Ordinance (Chapter 17.118 OMC). Therefore, the Project would have a less-than-significant impact on solid waste services and landfill capacity.

Mitigation: None required.

Energy

Impact UTIL-5: The Project would not violate applicable federal, state and local statutes and regulations relating to energy standards; nor result in a determination by the energy provider which serves or may serve the area that it does not have adequate capacity to serve projected demand in addition to the providers' existing commitments and require or result in construction of new energy facilities or expansion of existing facilities (Criteria 7 and 8). (Less than Significant)

The Project would result in an incremental increase in the demand for gas and electrical power. The Project is estimated to demand approximately 12,600 Therms of natural gas and 1.18 million kW-hrs of electrical power annually (Schneider, 2013; SCAQMD, 2011). PG&E stated that there are currently no known capacity limitations within the existing electrical system, and the Project is not anticipated to have significant adverse impacts to the electrical system. PG&E also stated there are currently no known capacity limitations within the existing gas system. The gas distribution network within the project vicinity is well supported given that there is an existing 20-inch semi-high pressure transmission main in Broadway, 26th Street, 27th Street, and Harrison Street (BKF, 2012a).

The Project would comply with all standards of Title 24 of the California Code of Regulations, as well as with UTIL SCA 3, *Compliance with the Green Building Ordinance***,** and UTIL SCA 4, *Compliance with the Green Building Ordinance for Building and Landscape Projects*, which require construction projects to incorporate energy-conserving design measures into projects. The Project would not be expected to violate applicable federal, state, and local statutes and regulations relating to energy standards or exceed PG&E's service capacity or require new or expanded facilities. Therefore, impacts to energy services would be less than significant.

Mitigation: None required.

Cumulative Impacts

Impact UTIL-6: The Project in combination with other past, present, existing, approved, pending, and reasonably foreseeable future projects within and around the Project would result in an increased demand for utilities services. (Less than Significant)

Geographic Context

The cumulative geographic context for utilities and service systems for the Project consists of the project site in addition to all areas of the city, and the region for those services provided regionally. Cumulative development considers those projects discussed in Section 4.01, *Cumulative Context*, in Chapter 4 of this Draft EIR.

Impacts

EBMUD's projections for water and wastewater demand incorporate growth pursuant to service-area-wide growth projections. As stated above, EBMUD has determined that it would meet area-wide water demand in wet and normal years, as well as meet demand during multiple dry years through a combination of conservation, recycled water, and new water supply projects. EBMUD and the City of Oakland plans regarding wastewater capacity similarly include cumulative development.

The Project would not result in a significant impact related to utilities and service systems. Like the Project would be required to do, past projects have been subject to, and current and reasonably foreseeable future projects would be subject to, UTIL SCA 1, *Waste Reduction and Recycling*, UTIL SCA 2, *Stormwater and Sewer*, HYD SCA 1, *Stormwater Pollution Prevention Plan*, and HYD SCA 2, *Post-construction Stormwater Management Plan*. Compliance with these SCAs would reduce the potential for a significant cumulative impact. Moreover, the Project would not contribute to any significant adverse cumulative impacts on utilities or service systems when considered together with past, present, existing, approved, pending and reasonably foreseeable development.

Mitigation: None required.

4.13.4 References

Alameda County Waste Management Authority (ACWMA), 2011. *Alameda County Integrated Waste Management Plan, Countywide Element*, adopted February 26, 2003, amended December 14, 2011.

BKF Engineers (BKF), 2012a. *Broadway/Valdez District Specific Plan, Infrastructure Analysis*, prepared for the City of Oakland, November 2012.

BKF Engineers (BKF), 2012b. *30th & Broadway – SS Impact Review*. July 27, 2012.

California Department of Resources Recycling and Recovery (CalRecycle), 2013a. Disposal Reporting System,www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx, accessed February 11, 2013.

CalRecycle, 2013b. Facility/Site Summary Details, Altamont Landfill and Resource Recovery (01-11-0009), www.calrecycle.ca.gov/SWFacilities/Directory/01-AA-0009/Detail/, accessed February 11, 2013.

CalRecycle, 2013c. Facility/Site Summary Details, Jurisdiction Diversion/Disposal Rate Detail, Oakland,www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionDetail.aspx?JurisdictionID=345&Year=2011, accessed February 11, 2013.

East Bay Municipal Utility District (EBMUD), 2011a. *2010 Urban Water Management Plan*, June 2011.

EBMUD, 2011b. *East Bayshore Recycled Water Project Fact Sheet*, December 2011.

EBMUD, 2011c. *2011 Annual Water Quality Report*, May 2012.

EBMUD, 2012a. *Water Supply Management Program 2040 Plan*, April 2012.

EBMUD, 2012b. *Sewer System Management Plan*, updated 2012.

SCAQMD, California Emissions Estimator Model, 2011.

Schneider Electric, 2013. Total Bill 360 Water Service and Natural Gas Usage 2012-2013, City of Sunnyvale Sprouts. May 29, 2013.

4.14 Other Less-than-Significant Effects

The July, 27, 2012 Notice of Preparation (NOP) for this EIR (included in Appendix A to this EIR) did not include an Initial Study Checklist and therefore did not identify any environmental topics as being specifically screened out for potential adverse environmental effects. However, the NOP did indicate that Agriculture and Forestry Resources; Mineral Resources; Population, Housing and Employment; Public Services; and Recreation were among several environmental factors that were not anticipated to have an environmental effect as a result of the Project, but that nevertheless would be analyzed in the EIR.

This chapter of the EIR provides a discussion and analysis of these environmental topics (or certain topics within these factors) which were not anticipated to rise to a level of significance and are not evaluated elsewhere in the EIR. (Criteria numbers for each topic refer to the specific significance criterion stated and enumerated in the City of Oakland's Thresholds/Criteria of Significance Guidelines.)

4.14.1 Agriculture and Forestry Resources

Farmland Conversion

The Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency to non-agricultural use (Criterion 1). (No Impact)

The project site is located in a highly urbanized portion of the City of Oakland, which is currently an existing surface parking lot that is entirely paved. The project site is not shown on the Farmland Mapping and Monitoring Program of the California Resources Agency as containing any prime, unique or important farmland (California Department of Conservation, 2011). The Project would have no impact.

Mitigation: None required.

The Project would not involve any changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use (Criterion 5). (No Impact)

The project site is located in a highly urbanized portion of the City of Oakland. There are no farmlands in the vicinity that could be converted to non-agricultural use as a result of any Project changes. The Project would have no impact.

Mitigation: None required.

Williamson Act Conflicts

The Project would not conflict with existing zoning for agricultural use, or a Williamson Act contract (Criterion 2). (No Impact)

The project site is zoned for a range of uses, including commercial, residential, civic, industrial, as well as agriculture use under specific conditions. There are no lands in the vicinity that are zoned for agriculture, and neither the Project site nor any lands in the project vicinity are under Williamson Act contracts. The Project would have no impact.

Mitigation: None required.

Forest Land and Timberland

The Project would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)); nor result in the loss of forest land or conversion of forest land to non-forest use (Criteria 3 or 4). (No Impact)

The project site is located in a highly urbanized portion of the City of Oakland. There are no forest lands or timberlands, or zoning for these uses, in the vicinity. Thus, the Project could not affect forest land or timberlands; the Project would have no impact.

Mitigation: None required.

4.14.2 Mineral Resources

The Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; nor result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan (Criteria 1 and 2). (No Impact)

According to the City's OSCAR Element of the General Plan, the project site is located in a developed urban area that has no known existing mineral resources. The project site and surrounding vicinity is mapped by the California Department of Mines and Geology (CDMG) as Mineral Resource Zones MRZ-1—an area where adequate information indicates a low likelihood of significant mineral resources (Stinson, et al., 1982). The Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; and would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. The Project would have no impact on important mineral resources.

Mitigation: None required.

4.14.3 Population, Housing and Employment

Population Growth

Impact POP-1: The Project would not induce substantial population growth in a manner not contemplated in the General Plan, either directly or indirectly (Criterion 1). (Less than Significant)

The Project does not propose to construct new housing that would induce direct population growth. The estimated increase in employment at the Project site (approximately 76 employees) is not so large as to induce substantial population growth, and employees for the Project can be found from within the existing available local labor force. The Project does not require the extension of any roads or other infrastructure that would lead to growth inducing impacts that were not previously considered or analyzed in the General Plan and its associated EIR. The impact would be less than significant.

Mitigation: None required.

Housing and/or Population Displacement

The Project would not displace substantial numbers of existing housing or people, necessitating the construction of replacement housing elsewhere in excess of that contained in the City's Housing Element (Criteria 2 and 3). (No Impact)

The Project involves the redevelopment of an existing surface parking lot. No housing or any other uses exist on the project site, thus no housing or population would be removed as part of the Project. The Project would have no impact.

Mitigation: None required.

4.14.4 Public Services

The following specifically addresses public schools criterion under Public Services, which is not considered to be affected by the Project. (Impacts are numbered as a continuation of the public services impacts identified in Section 4.11, *Public Services*, in Chapter 4 of this EIR, which addresses the other required public services topics.)

Public Schools

Impact PSR-4: The Project could result in new students for local schools, but would not require new or physically altered school facilities to maintain acceptable performance objectives (Criterion 1). (Less than Significant)

The Project does not involve residential uses and would not directly generate new student enrollment in the Oakland Unified School District. Whereas it is possible that families could relocate to Oakland or other adjacent communities as a result of the increase in employment opportunities generated by the Project, such increases in new families would be so minor (the estimated increase in employment at the Project site is approximately 76 new employees) that it is unlikely to induce population growth. Employees for the Project would likely be found from within the existing available local labor force, as discussed above under *Population, Housing and Employment*.

Pursuant to Senate Bill 50 (SB 50), the Project sponsor would be required to pay school impact fees established to offset potential impacts from new development on school facilities. Therefore, although the Project could indirectly result in a minor increase in resident population and potential student enrollment, payment of fees mandated under SB 50 is the mitigation measure prescribed by the statute. Payment of such fees is deemed full and complete mitigation. The impact would be less than significant.

Mitigation: None required.

4.14.5 Recreation

Park Usage and Facilities

Impact REC-1: The Project could increase the use of existing neighborhood or regional parks or other recreational facilities, but not such that substantial physical deterioration of the facility would occur or be accelerated, or cause the need for new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios (Recreation Criterion 1 and Public Services Criterion 1). (Less than Significant)

One of the nearest parks to the Project is the 11-acre Mosswood Park, located across I-580 at Broadway and MacArthur Boulevard. Also, three blocks northeast across Broadway from the project site is Oak Glen Park, which extends along the banks of the creek as it flows underneath I-580 just a block east of Piedmont Avenue, providing 2.79 acres of shaded parkland. Two other public open spaces near the project site are two plazas along Broadway’s Auto Row - one at 25th Street and one at 27th Street. The City’s Office of Parks and Recreation (OPR) also operates community-based centers located throughout City, including the Mosswood Park Recreation Center (within Mosswood Park), approximately 3.5 blocks north of the project site, north of the I-580 overpass.

The Project's effect on parks and recreation facilities would be indirect, resulting from the 76-job increase in employment opportunities at the site. As stated above under *Population, Housing and Employment,* this employment increase could result in a minor increase in the resident population in Oakland and surrounding communities, although it is anticipated that the Project would find employees for the new jobs from the existing local labor force. This minor increase in residential population in Oakland, as well as the increase in the number of employees and shoppers at the project site, could result in an increased use of nearby parks. However, the expected increase in park usage would be very minor given the extent of employment increase projected with the Project and because existing parks offer substantial capacity for increased use citywide. Although the City's Central Planning Area in which the project site is located has a per capita local-serving park acreage that is less than half the City's adopted standard, the City exceeds its overall parkland standard of 10 total acres per 1,000 residents, with 15.2 acres of parkland per 1,000 residents[1] (City of Oakland, 1996). The Project would not require new or physically altered parks or recreational facilities, the construction of which could cause significant environmental impacts. The impact would be less than significant.

Mitigation: None required.

Construction or Expansion of Recreational Facilities

The Project does not include recreational facilities or require the construction or expansion of recreational facilities which might have a substantial adverse physical effect on the environment (Criterion 2). (No Impact)

As stated above, no additions or expansions of parks or recreational facilities are proposed or required as part of the Project; there is no designated parkland on or adjacent to the project site. The Project does propose public outdoor seating areas/plazas and bicycle support facilities along the Broadway frontage of the new retail buildings. Construction of these Project elements would have no adverse physical effects on the environment, other than as described and identified on other chapters of this EIR.

Mitigation: None required.

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1 Oakland had approximately 5,937 acres of parkland and 390,724 residents in 2012.

4.14.6 References

City of Oakland, 1996. *Open Space, Conservation and Recreation (OSCAR), An Element of the Oakland General Plan*, adopted June 11, 1996.

City of Oakland, 1998. *Envision Oakland, City of Oakland General Plan, Land Use and Transportation Element (LUTE)*, as amended through March 24, 1998.

City of Oakland, 2007. *Land Use and Transportation Element of the Oakland General Plan*, March 24, 1998, amended to June 21, 2007.

California Department of Conservation (CDC), Map of Prime Farmland in Alameda County, 2011.

Stinson, M. C., M. W. Manson, J. J. Plappert, and others, Mineral Land Classification: Aggregate Materials in the San Francisco-Monterey Bay Area, Part II, Classification of Aggregate Resource Areas South San Francisco Bay Production-Consumption Region, California Division of Mines and Geology Special Report 146, 1982.

CHAPTER 5
Alternatives

5.1 CEQA Requirements

Pursuant to CEQA, this chapter presents a meaningful comparative analysis of the environmental effects of the Project and a reasonable range of potentially feasible alternatives to the Project. The discussion of alternatives in this chapter focuses on alternatives to the Project or its location that are capable of avoiding or substantially lessening any significant effects of the Project, even if such alternatives would impede, to some degree, the attainment of the Project objectives, or would be more costly. (CEQA Guidelines Sections 15126.6[a] and 15126.6[b].)

5.2 Factors Considered in Selection of Alternatives

The CEQA Guidelines recommend that an EIR briefly describe the rationale for selecting the alternatives to be discussed (CEQA Guidelines Section 15126.6[c]). The nature and scope of the reasonable range of alternatives selected to be discussed is governed by the "rule of reason," and the EIR is not required to analyze every possible feasible alternative to a project. The selection of the alternatives identified for analysis in this EIR considered the following factors:

- The extent to which the alternative would accomplish most of the basic goals and objectives of the Project;
- The extent to which the alternative would avoid or lessen the identified significant and unavoidable environmental effects of the Project;
- The feasibility of the alternative, taking into account site suitability, availability of infrastructure, general plan consistency, and consistency with other applicable plans and regulatory limitations;
- The extent to which an alternative contributes to a "reasonable range" of alternatives necessary to permit a reasoned choice; and
- The requirement of the CEQA Guidelines to consider a "no project" alternative and to identify an "environmentally superior" alternative.

The analysis also discusses alternatives that were considered by the Lead Agency (City of Oakland) but that it rejected as infeasible for detailed analysis in this EIR. (CEQA Guidelines Sections 15126.6.)

5.2.1 Project Objectives

As stated in the first factor bulleted above, the selection of alternatives shall consider the basic objectives of the Project. Restated from Chapter 3, *Project Description,* of this EIR, the project sponsor seeks to achieve the following basic objectives through implementation of the Project:

1) Redevelop an underutilized paved parking lot along Broadway with a high-quality grocery store, Sprouts Farmers Market, that offers a comprehensive range of products to Sprouts' customers, including local residents, businesses, and organizations, in a functional, customer-friendly, and attractive manner.

2) Provide the opportunity for several small retail tenants to locate adjacent to the grocery store, thereby expanding the availability of attractive retail opportunities and pedestrian activity on a portion of Broadway that currently lacks sufficient retail and pedestrian-friendly amenities.

3) Consistent with the goals of the proposed Draft Broadway Valdez District Specific Plan, stimulate economic activity and vitality in the Plan Area by developing a privately funded retail project that will be a catalyst for additional retail and other development in the Plan Area.

4) Provide sufficient, safe, inviting, and well-lit off-street parking and bicycle parking to serve the retail customers.

5) Provide new areas of publicly accessible plazas and seating areas that will enhance the surrounding neighborhood, provide gathering places, and establish an attractive and inviting setting for pedestrian friendly shopping.

6) Develop the Project in a manner that will be sensitive to the surrounding uses and will minimize neighborhood impacts.

7) Develop a Project that is financially feasible and provides a sufficient investment return.

5.2.2 Significant and Unavoidable Impacts

The selection of alternatives shall consider the ability for each alternative to avoid or lessen the significant environmental impacts identified with the Project (the second factor bulleted above in Section 5.2), as identified in Chapter 4. The following two significant impacts are identified with the Project and considered "unavoidable" because no feasible mitigation measures are available to reduce the significant impact to a less-than-significant level:

- **Impact GHG-1: The Project would produce greenhouse gas emissions that exceed 1,100 metric tons of CO2e per year and that would exceed 4.6 metric tons of CO2e per service population annually. (Conservatively identified as Significant and Unavoidable)**

  As discussed in Section 4.6, *Greenhouse Gases and Climate Change*, in Chapter 4 of this EIR, the Project would exceed the quantitative GHG emissions significance thresholds and therefore would implement GHG SCA 1, *Greenhouse Gas Reduction Plan*. All feasible GHG reduction measures have been factored into or considered for the Project, and the purchase of carbon offsets by the project applicant is required to reduce the Project's incremental GHG emissions above 1,100 MT of CO_2e per year (approximately 411 MT CO_2e per year) and meet the requirements of GHG SCA 1. Because the ongoing feasibility of this measure to be implemented by the project applicant is cannot be certain in the future (due to the inability to foresee with certainty the future market for and cost of purchasing carbon credits over time), this impact is conservatively considered significant and unavoidable.

- **Impact TRANS-3: The Project would increase the V/C ratio for a critical movement by 0.05 or more (Significant Threshold #5) during the weekday PM peak hour and increase the total intersection V/C ratio by 0.03 or more and increase the V/C ratio for a critical movement by 0.05 or more during the Saturday peak hour (Significant Threshold #5) at the *27th Street/24th Street/Bay Place/Harrison Street* (#11) intersection, which would operate at LOS F under 2035 conditions. (Significant and Unavoidable for the PM peak hour only)**

  After the implementation of Mitigation Measure TRANS-3, this intersection would continue to operate at conditions considered significant for the V/C ratio for critical movements in the PM peak hour.

5.3 Alternatives Selected for Consideration

The City of Oakland, as Lead Agency, has specified five development alternatives plus the required "no project" alternative for detailed evaluation in this EIR. This reasonable range of alternatives was developed based on applicable planning and zoning regulations; public and staff comments received on the scope of this EIR; and the basic objectives of the Project. Of particular note, the City received several comments during the public scoping period for the EIR requesting that one or more higher-density mixed use alternative(s) be evaluated (all comments received are provided in Appendix A to this EIR). Each of the selected alternatives is outlined in **Table 5-1**, **Summary of Alternatives to the Project**, and described in greater detail following the table and in Section 5.4, *Comparative Alternatives Analysis*.

The alternatives selected for evaluation in this EIR are summarized below.

- **No Project** *(No Change to Existing Conditions)*: The Project would not be developed. All existing conditions would continue into the future.
- **1A: Mixed Use 150** *(Residential + Grocery + Local Retail)*: 150 multifamily units above a 28,000 square-foot grocery store and 6,500 square feet of local-serving retail. (Plans of Alternative 1A accompany its detailed description in Section 5.4, below.)
- **1B: Mixed Use 225** *(Residential + Grocery + Local Retail)*: 225 multifamily units above a 26,000 square-foot grocery store and 9,400 square feet of local-serving retail (Plans of Alternative 1B accompany its detailed description in Section 5.4, below.)
- **2: Mixed Use 225/No Grocery** *(Residential + Local Retail)*: 225 multifamily units above 20,000 square feet of local-serving retail.
- **3: Office/Retail** *(Office + Local Retail)*: 100,000 square feet of office use above 10,000 square feet of local-serving retail.
- **4: Fully Mitigated/Grocery Only** *(Grocery)*: 20,000 square-foot grocery store.

TABLE 5-1
SUMMARY OF ALTERNATIVES TO THE PROJECT

			Reduced Project + Residential				
NOTE: A summary narrative of each of alternative follows this table.	**Project**	**No Project** ***(No Change to Existing Conditions)***	**1A: Mixed Use 150** ***(150 Units + Grocery/ Local Retail)***[a]	**1B: Mixed Use 225** ***(225 Units + Grocery/ Local Retail)***[a]	**2: Mixed Use 225/ No Grocery** ***(225 Units + Local Retail)***	**3: Office/Retail** ***(Office + Local Retail)***	**4: Fully Mitigated / Grocery Only**
Grocery Store	26,000	-	28,000	26,000	-	-	20,000
Local Serving Retail	10,000	-	6,500	9,400	20,000	10,000	-
Office	-	-	-	-	-	100,000	-
Residential Units			**150**	**225**	**225**		
Studios	-	-	-	54 (24%)	54 (24%)	-	-
1 Bedrooms	-	-	100 (67%)	114 (51%)	114 (51%)	-	-
2 Bedrooms	-	-	45 (30%)	57 (25%)	57 (25%)	-	-
3 Bedrooms	-	-	5 (3%)	-	-	-	-
Parking Spaces	**158**		**279**	**328**	**223**	**201**	**100**
Retail	158	-	157	173	68 [b]	34 [b]	100 [b]
Residential	-	-	122	155	155	-	-
Office	-	-	-	-	-	167 [c]	-
General	-	287	-	-	-	-	-
Maximum Building Height	40 feet / 2 levels	0	75 feet / 6 levels	75 feet / 6 levels	75 feet / 6 levels	65 feet / 5 levels	40 feet / 2 levels
Driveways / Ramps							
30th Street	1 driveway / 2 ramps	2 driveways	2 driveways / 2 ramps	2 driveways / 3 ramps	2 driveways / 2 ramps	1 driveway/ 2 ramps	1 driveway (surface lot)
Broadway	1 driveway (trucks only)	7 driveways	1 driveway (trucks + residents)	1 driveway (trucks only)	1 driveway (residents only)	1 driveway (trucks only)	1 driveway (trucks only)
Ramps	West Elevation	-	West Elev. + Internal	West Elev. + Internal	West Elev. + Internal	West Elev. + Internal	West Elevation
West Setbacks							
Ground Level	24 feet / 10 feet	-	10 feet	10 feet	10 feet	10 feet	24 feet / 10 feet
Upper Level(s)	10 feet	-	25 feet / 10 feet	10 feet	10 feet	25 feet / 10 feet	25 feet
Other Basic Characteristics			Each alternative will incorporate, as appropriate to its scale and use, all other basic characteristics of the Project, including biofiltered landscaped areas, sustainability and green building elements, rooftop landscaping, public realm improvements, signage, and lighting.				

[a] Lowney Architecture, 2013.
[b] Same as proposed Project assumptions and ratios. [c] Based on Oakland Municipal Code Section 17.116.080

5.4 Comparative Alternatives Analysis

5.4.1 Approach

As permitted by CEQA, the effects of the alternatives are discussed in less detail than is presented in Chapter 4 for the Project (CEQA Guidelines Section 15126.6[d]). However, the analysis is conducted at a sufficient level of detail to provide the public, other public agencies, and Project decision-makers adequate information to fully evaluate the alternatives and approve any of the alternatives without further environmental review.

Impacts are stated as levels of significance *after* the implementation of mitigation measures and/or incorporation of the City's Standard Conditions of Approval (SCAs) identified in Chapter 4, except where discussion of pre-mitigation effects is relevant to the comparison.

In most cases, the comparisons are qualitative and discussed in terms of whether the alternative would avoid the Project's impact or result in a new impact not identified with the Project. If the impact *determinations* (i.e., less-than-significant, less-than-significant after mitigation, or significant and unavoidable) are the same for the Project and an alternative, the comparison discusses the relative *degree* of the impact (i.e., "greater than" or "less than") compared to the Project's impact determination.

The following evaluation of alternatives primarily focuses on the extent to which each alternative would compare to the Project's conservatively significant and unavoidable greenhouse gas emissions and significant and unavoidable traffic impact, and then less so on the Project's less-than-significant impacts for particularly relevant and quantifiable topic (air quality). Topics for which the Project and the alternatives have less-than-significant impacts and not notable degrees of variation are discussed collectively.

For the reviewer's convenience, **Table 5-2, Summary of Quantified Characteristics of the Alternatives,** is a summary of quantified data calculated for each alternative, as summarized from **Appendix H** to this EIR and as presented in the topical impact discussions following the table.

5.4.2 Description and Analysis of Alternatives

Throughout this section, a description of each alternative is followed by a discussion of how the impacts of the alternative compare to those identified for the Project.

No Project Alternative

Description

CEQA requires that the EIR consider a "no project" alternative to allow a comparison of the environmental impacts that would result if the project were not approved with those that

TABLE 5-2
SUMMARY OF QUANTIFIED CHARACTERISTICS OF THE ALTERNATIVES

		Reduced Project + Residential				
	Project	**1A: Mixed Use 150** ***(150 Units + Grocery/ Local Retail)***[a]	**1B: Mixed Use 225** ***(225 Units + Grocery/ Local Retail)***[a]	**2: Mixed Use 225/ No Grocery** ***(225 Units + Local Retail)***	**3: Office/Retail** ***(Office + Local Retail)***	**4: Fully Mitigated / Grocery Only**
Vehicle Trips						
Daily Vehicle Trips	3,385	3,898	4,546	**2,322**	**1,656**	**2,268**
Peak Hour Vehicle Trips (AM/PM/Saturday)	130 / 239 / 308	161 / 274 / 326	220 / 348 / 399	142 / **211** / **231**	165 / **195** / **137**	**68 / 44 / 157**
GHG Emissions						
Total Emissions (CO_2e)	1,510	2,616	3,190	2,505	1,708	**1,067**
GHG Emissions by Service Population (CO_2e)	19.9	**7.6**	**6.7**	**5.6**	**4.9**	24.8
Air Quality						
ROG / NO_x / $PM_{2.5}$ (pounds/day)	9.6 /17.8 / 0.7	17.5 / 27 / 2.4	22.2 / 33 / 1.4	16 / 21 / 1.3	**9.2** / **15.4** / 0.8	**6.48 / 12.25 / 0.5**
PM_{10} (pounds/day)	6.9	13.1	16.5	11.6	8.6	**4.98**
Service Population	76	342	479	444	350	**43**
Employees	76	73	75	40	20	43
Residents	-	269	404	404	330	-

Bold and underlined indicates value is less than would occur with the Project.

[a] Lowney Architecture, 2013.

SOURCE: Detailed tables for each of the data in this table are provided in Appendix H, *Alternatives Technical Detail,* to this Draft EIR.

would occur if the project were approved. With the No Project Alternative, the Project would not occur; the project site would continue to operate as a fully paved parking lot in its existing condition. Existing conditions reflecting the No Project Alternative are described in Section 3.1, *Project Location and Site Characteristics*, and shown in Figures 4.1-2 (photo #2) and 4.1-3 (photo #4), in Chapter 3 to this EIR.

No Project Alternative Impacts Compared to the Project's

None of the impacts identified with the Project would occur since no new development or its associated traffic, air quality and noise (including those associated with the Project traffic), greenhouse gas (GHG) emissions, new structures, utility and service demands, or construction activity would occur. In particular, the No Project Alternative would avoid the conservatively significant and unavoidable impact to greenhouse gas emissions (Impact GHG-1) and the significant and unavoidable impact to traffic (Impact TRANS-3).

As described in the analysis in Chapter 4, the Project would involve improvements to certain existing conditions that would not otherwise be improved under the No Project Alternative. For example, the Project would introduce biofiltration landscaping on the project site, which would reduce runoff flows and improve stormwater quality (Impacts HYD-1 in Section 4.8, *Hydrology and Water Quality*, in Chapter 4; and Impact UTIL-3 in Section 4.13, *Utility and Service Systems*, in Chapter 4.) Similarly, the City acknowledges the subjective nature of determining aesthetics effects and that the Project could be considered to have beneficial effects to the visual character and quality of the project site compared to existing conditions (Impact AES-2 in Section 4.1, *Aesthetics*, in Chapter 4). While a significant adverse visual character/quality condition is not considered to exist under the No Project Alternative, the existing condition (a paved surface parking lot) would not be improved with new development as it would with the Project.

Overall, the No Project Alternative would avoid all of the impacts identified with the Project. Additionally, it would not improve existing stormwater and aesthetics conditions that would occur with the Project.

Alternative 1A: Mixed-Use 150

Description

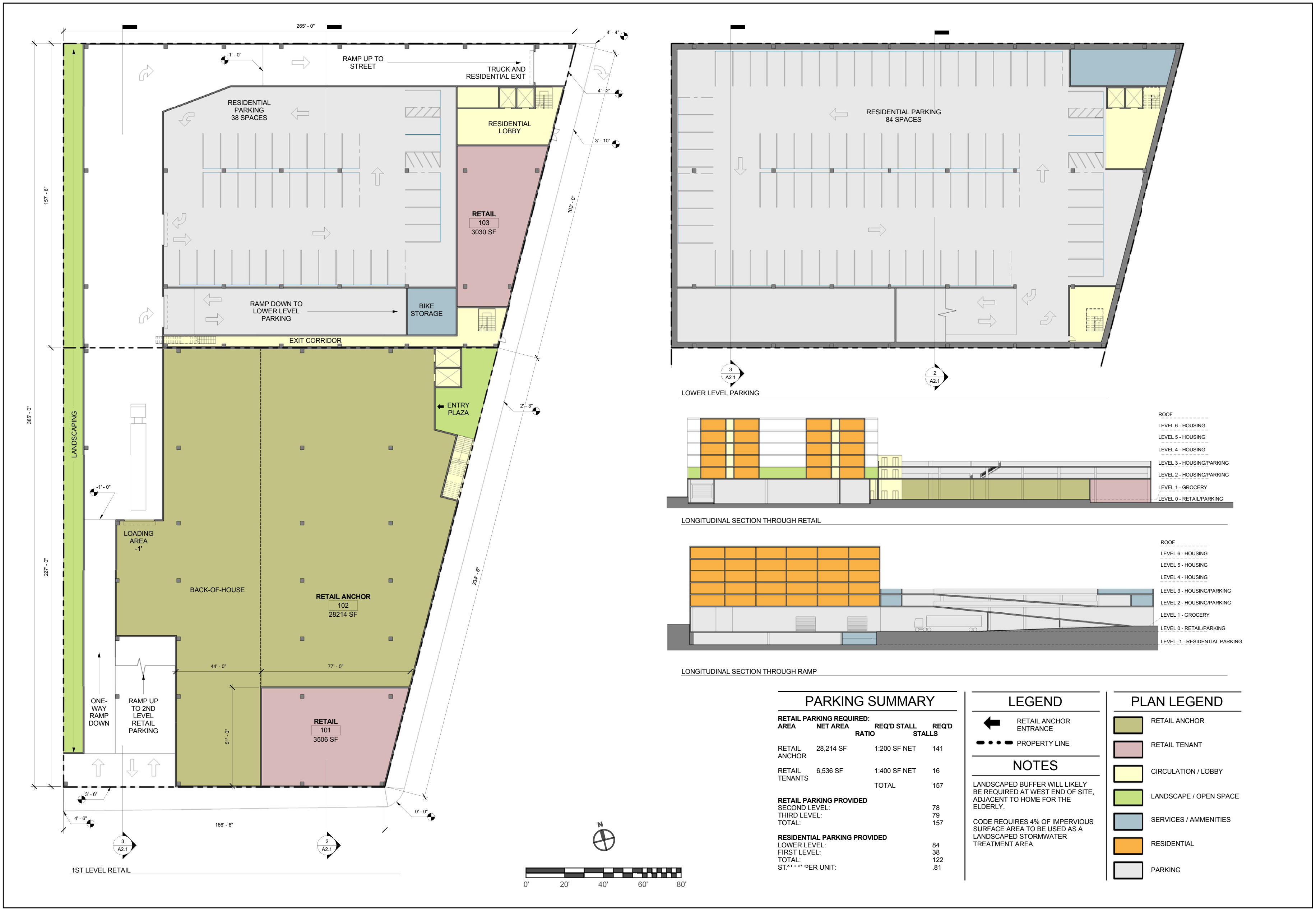
Uses/By Level

Site plans and sections of Alternative 1A are shown in **Figures 5-1** and **5-2**. Alternative 1A considers 150 multifamily units built above a 28,000 square-foot grocery store and two local-serving retail spaces on the ground/first level. Overall, the tallest portions of the building would be six levels and up to 75 feet tall above grade (compared to one-story with an upper-level parking deck and 40 feet tall with the Project), with one lower level underground. Specifically, on the north portion of the project site, residences would be built in five levels above the ground/first level retail and a lower parking level. The south portion of the project site would be two levels above the ground/first level retail. Alternative 1A is the only alternative with an underground level.

Residential parking would be provided on the lower and ground/first levels on the north portion of the site (below the residences). Retail parking would be provided on the second and third levels on the south portion of the site (above the retail uses).

Access/Egress, Loading and Utilities

Like the Project, all vehicular access (residential, retail, and service/delivery) would enter the site via 30th Street. Instead of a single ramp to the upper parking deck as proposed with the Project, Alternative 1A would provide one ramp to the lower residential parking level and a separate ramp up to the retail parking levels. For egress, retail vehicles (which would park on the south portion of the site) would exit onto 30th Street, but residential and service/delivery vehicles (which would park on the north portion of the site) would exit at the northeast corner of the project site, onto Broadway. The loading dock would be located internal to the site, but closer to the west site



PARKING SUMMARY

RETAIL PARKING REQUIRED:

AREA	NET AREA	REQ'D STALL RATIO	REQ'D STALLS
RETAIL ANCHOR	28,214 SF	1:200 SF NET	141
RETAIL TENANTS	6,536 SF	1:400 SF NET	16
		TOTAL	157

RETAIL PARKING PROVIDED

SECOND LEVEL:	78
THIRD LEVEL:	79
TOTAL:	157

RESIDENTIAL PARKING PROVIDED

LOWER LEVEL:	84
FIRST LEVEL:	38
TOTAL:	122
STALLS PER UNIT:	.81

LEGEND

RETAIL ANCHOR ENTRANCE

PROPERTY LINE

NOTES

LANDSCAPED BUFFER WILL LIKELY BE REQUIRED AT WEST END OF SITE, ADJACENT TO HOME FOR THE ELDERLY.

CODE REQUIRES 4% OF IMPERVIOUS SURFACE AREA TO BE USED AS A LANDSCAPED STORMWATER TREATMENT AREA

PLAN LEGEND

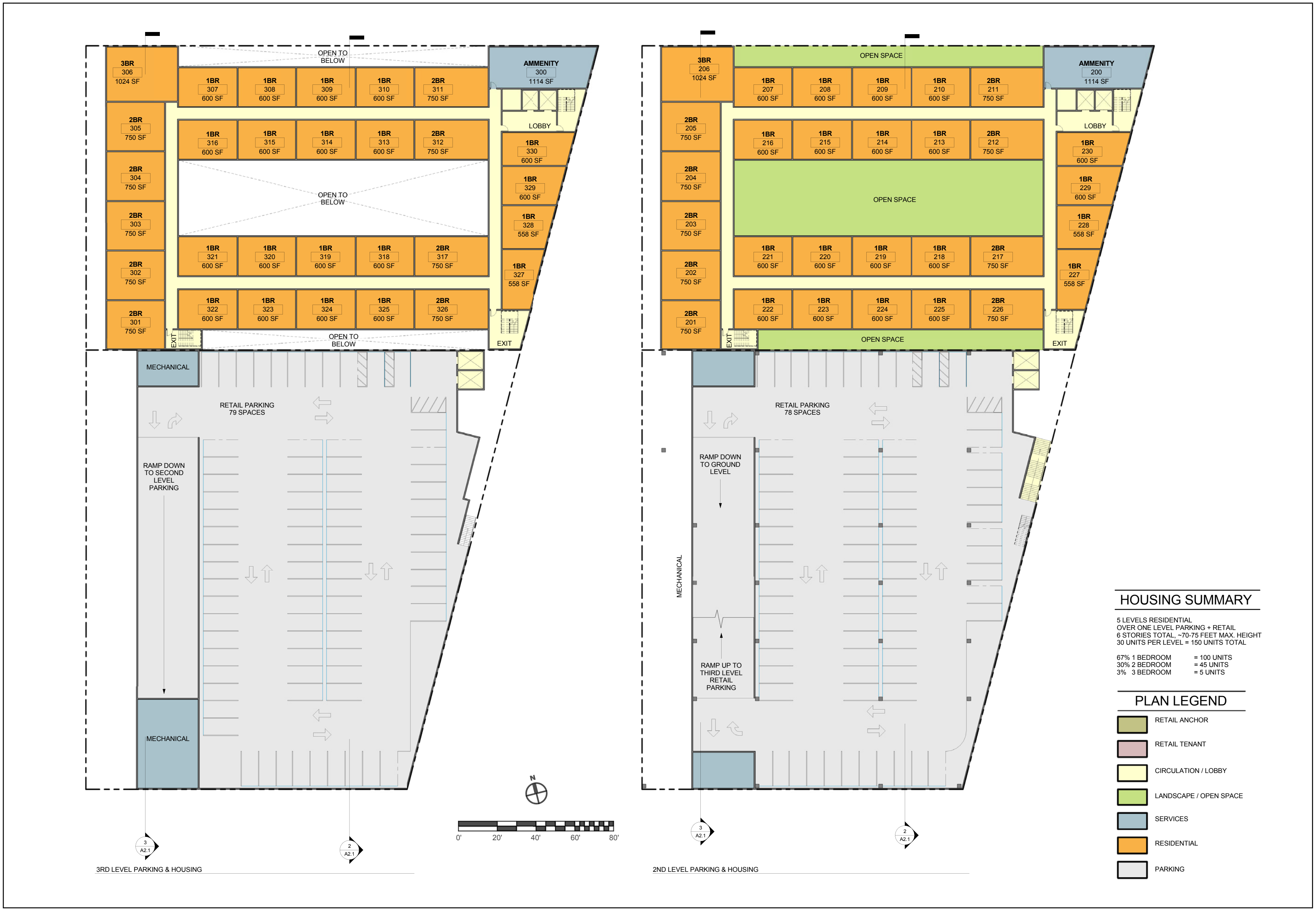
- RETAIL ANCHOR
- RETAIL TENANT
- CIRCULATION / LOBBY
- LANDSCAPE / OPEN SPACE
- SERVICES / AMMENITIES
- RESIDENTIAL
- PARKING

SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 5-1

Mixed Use Alternative 1A - Level 1, Lower Level and Sections



SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 5-2

Mixed Use Alternative 1A - Levels 2 through 6 boundary rather than the northeast corner of the site. However, the service/delivery truck exit is on Broadway, as with the Project. Mechanical/service areas would be located on the lower level and at the upper level retail parking decks, including in the southwest corner of the parking decks, as shown in Figures 5-1 and 5-2.

Setbacks/Frontages and Pedestrian Access

The vehicular circulation space required for Alternative 1A limits the ground-floor setback from the west property line to 10 feet for the length of the project site. Above the ground floor, the 10-foot building setback from the west property line would be maintained for the five residential levels in the north portion of the site, and would increase to 25 feet for the two retail parking levels in the south portion of the site.

Alternative 1A would locate a residential entrance lobby near the northeast corner of the site, with a relatively smaller retail entry plaza to the grocery store anchor than proposed with the Project. The two smaller retail spaces would also front on Broadway.

Impact Comparison: Alternative 1A and the Project

Noise

Alternative 1A would generate more daily and peak hour vehicle trips and involve more construction than the Project given the addition of 150 residences, even though it also would have 1,500 less square feet of total retail area (see Tables 5-1 and 5-2). However, Alternative 1A would result in the same impact determinations for all noise topics, increasing the degree of the less-than-significant effects pertaining to construction noise, traffic noise and other operational noise (Impacts NOI-1 through NOI-7).

Transportation and Circulation

As discussed above for Noise, Alternative 1A would generate more daily and peak hour vehicle trips than the Project given the addition of 150 residences, even though it also would have 1,500 less square feet of total retail area (see Tables 5-1 and 5-2). As a result, it would continue to have the **significant and unavoidable** traffic impact identified at the intersection of *27th Street/24th Street/Bay Place/Harrison Street* during the PM peak hour with the Project (Impact TRANS-3), and to an increased degree given the higher number of vehicle trips.

Alternative 1A also would result in the same impact determinations for all other traffic topics, increasing the degree of all the less-than-significant (with mitigations) effects given the increased traffic compared to the Project.

Air Quality

Although Alternative 1A would increase the degree of impacts because it would generate more daily and peak hour vehicle trips and involve more construction than the Project given the addition of 150 residences, it would continue to have the same less-than-significant air quality impacts as identified with the Project.

Because Alternative 1A would introduce residential uses on the project site within an area of known stationary sources of toxic air contaminants (TACS), SCA B (Exposure to Air Pollution – TACs and Particulate Matter) would be applied to the Alternative to ensure a less-than-significant impact regarding potential health risks associated with exposure to TACs (see Impact AIR-4).

Greenhouse Gases and Climate Change

Because Alternative 1A would generate more overall traffic, and involve more construction and other GHG source emissions than the Project, it would generate more metric tons (MT) of CO_2e annually than the Project (see Table 5-2), and would continue to have the conservatively **significant and unavoidable** GHG impact as identified with the Project (Impact GHG-1).

Because Alterative 1A would introduce more service population on the project site compared to the Project (see Table 5-2), the metric tons of CO_2e (MT CO_2e) per service population would be lower (which is more efficient, as measured by a rate of persons per unit of emissions annually). Therefore, the degree of effect regarding consistency with GHG emissions reduction plans and policies is considered increased (more consistent) relative to the Project (Impact GHG-2).

Other Less-than-Significant Topics

Alternative 1A would result in the same or slightly increased degree of impacts for all other topics compared to the Project. Given its increased overall building height and operations compared to the Project, Alternative 1A may have slightly increased effects regarding light and glare (Impact AES-3) and less so to scenic resources, particularly since the analysis in Impact AES-2 acknowledges that there are no existing views from or across the project site that are considered scenic or unique. Because Alternative 1A includes a subsurface level parking, it may have a slightly increased risk of impacting unknown subsurface resources (Impact CUL-2). Because Alternative 1A would result in substantially more population on the project site, including new residents, it would have a greater degree of effect related to inducing population growth (Impact POP-1), as well as demands for public services and recreational facilities (Impacts PSR-1, PSR-2, PSR-4, and REC-1), and utilities and services system demands (Impacts UTIL-1, UTIL-2, and UTIL-4).

Alternative 1B: Mixed-Use 225

Description

Uses/By Level

Site plans of Alternative 1B are shown in **Figures 5-3** and **5-4**. Alternative 1B considers 225 multifamily units built above a 26,000 square-foot grocery store and three local-serving retail spaces on the ground/first level. The building would be six levels and up to 75 feet tall (compared to one-story with an upper-level parking deck and 40 feet tall with the Project) above grade and would not include a lower level underground (which is only proposed with Alternative 1A).

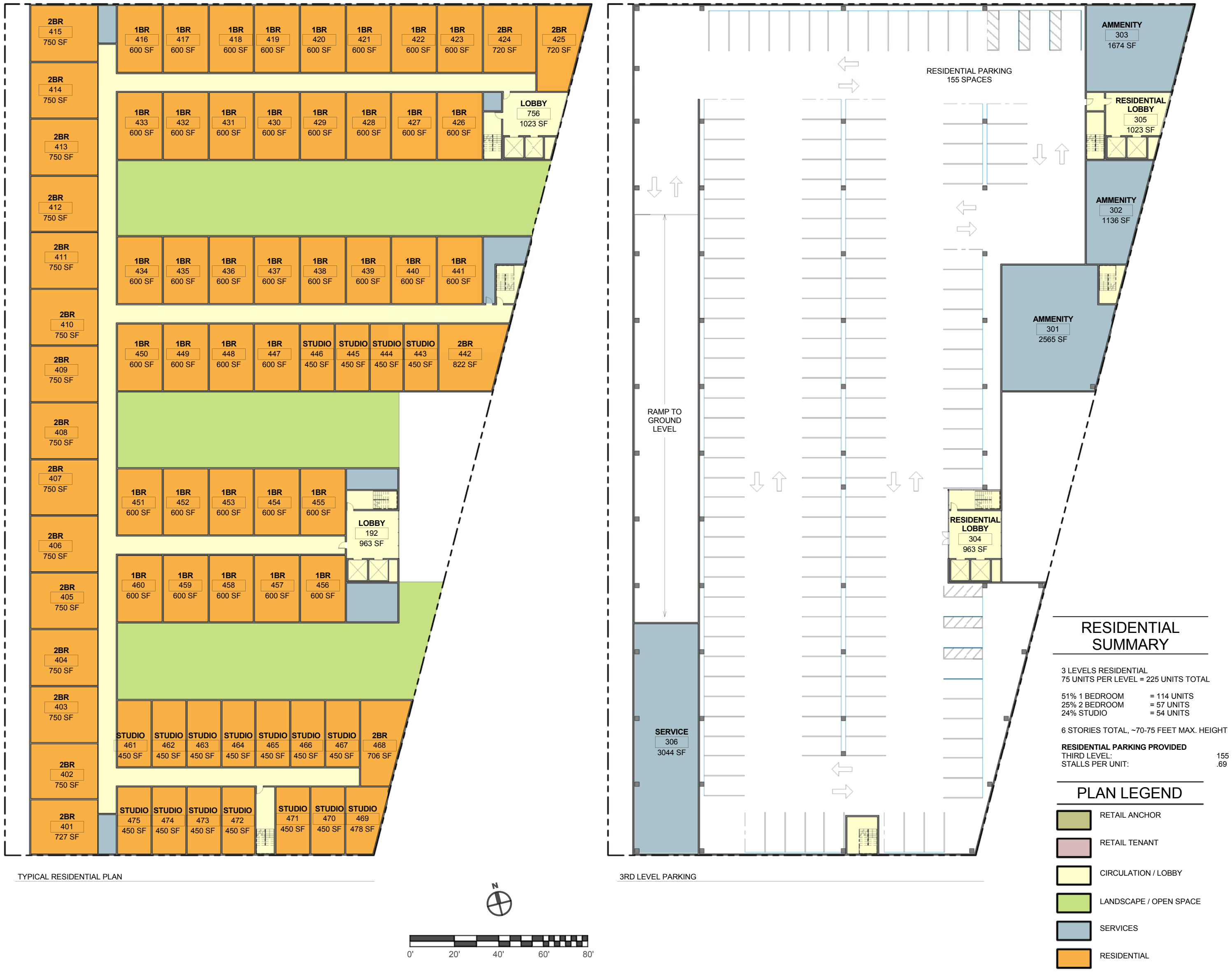
SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 5-3

Mixed Use Alternative 1B - Levels 1 and 2

TYPICAL RESIDENTIAL LEVEL		
#	TYPE	AREA
1BR		
426	1BR	600 SF
433	1BR	600 SF
416	1BR	600 SF
432	1BR	600 SF
417	1BR	600 SF
431	1BR	600 SF
418	1BR	600 SF
430	1BR	600 SF
429	1BR	600 SF
419	1BR	600 SF
428	1BR	600 SF
434	1BR	600 SF
450	1BR	600 SF
435	1BR	600 SF
449	1BR	600 SF
436	1BR	600 SF
448	1BR	600 SF
437	1BR	600 SF
447	1BR	600 SF
438	1BR	600 SF
439	1BR	600 SF
452	1BR	600 SF
453	1BR	600 SF
459	1BR	600 SF
454	1BR	600 SF
458	1BR	600 SF
420	1BR	600 SF
427	1BR	600 SF
421	1BR	600 SF
451	1BR	600 SF
460	1BR	600 SF
440	1BR	600 SF
441	1BR	600 SF
455	1BR	600 SF
457	1BR	600 SF
456	1BR	600 SF
422	1BR	600 SF
423	1BR	600 SF
1BR: 38		22800 SF
2BR		
414	2BR	750 SF
413	2BR	750 SF
415	2BR	750 SF
412	2BR	750 SF
411	2BR	750 SF
410	2BR	750 SF
409	2BR	750 SF
408	2BR	750 SF
407	2BR	750 SF
406	2BR	750 SF
405	2BR	750 SF
404	2BR	750 SF
403	2BR	750 SF
402	2BR	750 SF
468	2BR	706 SF
401	2BR	727 SF
425	2BR	720 SF
424	2BR	720 SF
442	2BR	822 SF
2BR: 19		14195 SF
STUDIO		
446	STUDIO	450 SF
445	STUDIO	450 SF
465	STUDIO	450 SF
464	STUDIO	450 SF
463	STUDIO	450 SF
462	STUDIO	450 SF
475	STUDIO	450 SF
474	STUDIO	450 SF
473	STUDIO	450 SF
472	STUDIO	450 SF
470	STUDIO	450 SF
466	STUDIO	450 SF
467	STUDIO	450 SF
461	STUDIO	450 SF
444	STUDIO	450 SF
443	STUDIO	450 SF
471	STUDIO	450 SF
469	STUDIO	478 SF
STUDIO: 18		8128 SF
Grand total: 75		45123 SF



SOURCE: Lowney Architecture

The Shops at Broadway Retail Project

Figure 5-4

Mixed Use Alternative 1B - Levels 3 through 6

Specifically, the residences would be built in three levels above the ground/first retail level, a retail parking level, and a residential parking level. As shown in Figure 5-4, the residences would be arranged over the entirety of the building in a finger-like configuration with intervening open spaces.

Access/Egress, Loading and Utilities

Like the Project, all vehicular access (residential, retail, and service/delivery) would enter the site via 30th Street. There would be two separate driveways: one for retail users and service trucks to enter and for retail users to exit, and another separate driveway for residential access and egress only (see Figure 5-3). Alternative 1B would also provide one ramp downward (but not fully underground) to the loading area, a ramp to/from the retail parking on the second level, and a third ramp directly to/from the residential parking on the third level. Like the Project, the loading dock would be located internal to the site, and mechanical/service areas would be located on the second level retail parking deck and the third level residential parking deck, including in the southwest corner of the parking decks, as shown in Figures 5-3 and 5-4.

Setbacks/Frontages and Pedestrian Access

The vehicular circulation space required for Alternative 1B limits the ground-floor setback from the west property line to 10 feet for the length of the project site and the height of the building (see Figure 5-3).

Alternative 1B would locate a residential entrance lobby near the northeast corner of the site, with a relatively smaller retail entry plaza to the grocery store anchor and other retail spaces than proposed with the Project. The three smaller retail spaces would also front on Broadway.

Impact Comparison: Alternative 1B and the Project

Noise

Alternative 1B would generate more daily and peak hour vehicle trips and involve more construction than the Project given the addition of 225 residences, even though it also would have 600 less square feet of total retail area (see Tables 5-1 and 5-2). However, Alternative 1B would result in the same impact determinations for all noise topics, increasing the degree of the less-than-significant effects pertaining to construction noise, traffic noise, and operational noise (Impacts NOI-1 through NOI-7).

Transportation and Circulation

As described above for Noise, Alternative 1B would generate more daily and peak hour vehicle trips than the Project. As a result, it would continue to have the **significant and unavoidable** traffic impact identified at the intersection of *27th Street/24th Street/Bay Place/Harrison Street* during the PM peak hour with the Project (Impact TRANS-3), and to an increased degree given the higher number of vehicle trips.

Alternative 1B also would result in the same impact determinations for all other traffic topics, increasing the degree of all the less-than-significant (with mitigations) effects given the increased traffic compared to the Project.

Air Quality

Alternative 1B would generate more daily and peak hour vehicle trips and involve more construction than the Project given the addition of 225 residences. It would continue to have the same less-than-significant air quality impacts as identified with the Project, but to an increased degree.

Because Alternative 1B would introduce residential uses on the project site within an area of known stationary sources of toxic air contaminants (TACS), SCA B (Exposure to Air Pollution – TACs and Particulate Matter) would be applied to the Alternative to ensure a less-than-significant impact regarding potential health risks associated with exposure to TACs (see Impact AIR-4).

Greenhouse Gases and Climate Change

Because Alternative 1B would generate more overall traffic, involve more construction and other GHG source emissions than the Project, Alternative 1B would generate more MT of CO_2e annually than the Project (see Table 5-2), and would continue to have the conservatively **significant and unavoidable** GHG impact as identified with the Project (Impact GHG-1). .

Because Alterative 1B would introduce more service population on the project site compared to the Project (see Table 5-2), the MT CO_2e per service population would be lower (which is more efficient, as measured by a rate of persons per unit of emissions annually). Therefore, consistency with GHG emissions reduction plans and policies would be increased (more consistent) relative to the Project (Impact GHG-2).

Other Less-than-Significant Topics

Like Alternative 1A, Alternative 1B would result in the same or slightly increased degree of impacts for all other topics compared to the Project. Given its increased overall building height and operations compared to the Project, Alternative 1B may have slightly increased effects regarding light and glare (Impact AES-3) and less so to scenic resources, particularly since the analysis in Impact AES-2 acknowledges that there are no existing views from or across the project site that are considered scenic or unique. Because Alternative 1B would result in substantially more population on the project site, including new residents, it would have a greater degree of effect related to inducing population growth (Impact POP-1), as well as demands for public services and recreational facilities (Impacts PSR-1, PSR-2, PSR-4, and REC-1), and utilities and services system demands (Impacts UTIL-1, UTIL-2, and UTIL-4).

Alternative 2: Mixed-Use 225 / No Grocery

Description

Uses/By Level

Alternative 2 is similar to Alternative 1B, except that the 225 multifamily units would be built above 20,000 square feet of local-serving retail space on the ground/first level. No grocery store anchor would be included. The building would be six levels and up to 75 feet tall above grade for this alternative (compared to one-story with an upper-level parking deck and 40 feet tall with the Project) and would not include a lower level underground (which is only proposed with Alternative 1A).

The residences would be built in three levels above the ground/first retail level, a retail parking level, and a residential parking level, essentially the same as shown in Figure 5-4 for Alternative 1B. The residences would be arranged over the entirety of the building in a finger-like configuration with intervening open spaces (also as in Figure 5-4 for Alternative 1B). Alternative 2 conservatively assumes a full parking level for the retail uses, even though only approximately 68 retail parking spaces would be provided (and a full parking deck accommodates approximately 165 spaces, as with Alternative 1B, see Figure 5-3).

Access/Egress, Loading and Utilities

Like the Project, all vehicular access (residential, retail, and service/delivery) would enter the site via 30th Street. There would be two separate driveways: one for retail users and service trucks to enter and for retail users to exit, and another separate driveway for residential access and egress only. All aspects of the ramping with Alternative 2 would be the same as described for Alternative 1B.

Setbacks/Frontages and Pedestrian Access

The ground-floor setback from the west property line would be 10 feet for the length of the project site and the height of the building (see same as shown in Figure 5-3).

Alternative 2 would locate a residential entrance lobby near the northeast corner of the site, with a retail plaza to the five to six retail spaces, all of which would front on Broadway.

Alternative 2 Impacts Compared to Project's

Noise

Alternative 2 would generate fewer daily vehicle trips and fewer PM and Saturday peak hour vehicle trips and involve more construction than the Project given the addition of 225 residences, even though it also would have 16,000 less square feet of total retail area (see Tables 5-1 and 5-2). Alternative 2 would result in the same impact determinations for all noise topics, but specifically increasing the degree of effects pertaining to all noise effects: construction, traffic, and other operations (Impacts NOI-1 through NOI-7). It would notably increase the degree of effect related to construction noise, given the additional amount of construction that would occur with Alternative 2.

Transportation and Circulation

As described above for Noise, Alternative 2 would generate fewer daily vehicle trips and fewer PM and Saturday peak hour vehicle trips than the Project. However, it would continue to have the **significant and unavoidable** traffic impact identified at the intersection of *27th Street/24th Street/Bay Place/Harrison Street* during the PM peak hour with the Project (Impact TRANS-3), but to a lesser degree given the reduced number of vehicle trips.

Alternative 2 also would result in the same impact determinations for all other traffic topics, decreasing the degree of all the less-than-significant (with mitigations) effects given the reduced traffic compared to the Project.

Air Quality

Although Alternative 2 would generate fewer daily vehicle trips and fewer PM and Saturday peak hour vehicle trips than the Project, it would continue to have the same less-than-significant air quality impacts as identified with the Project, and the degree of the impact would be reduced.

Like Alternatives 1A and 1B, because Alternative 2 would introduce residential uses on the project site within an area of known stationary sources of toxic air contaminants (TACS), SCA B (Exposure to Air Pollution – TACs and Particulate Matter) would be applied to the Alternative to ensure a less-than-significant impact regarding potential health risks associated with exposure to TACs (see Impact AIR-4).

Greenhouse Gases and Climate Change

Alternative 2 would generate fewer overall vehicle trips, but it would still generate more MT of CO_2e annually than the Project (see Table 5-2). Therefore it would continue to have the conservatively **significant and unavoidable** GHG impact as identified with the Project (Impact GHG-1).

Because Alterative 2 would introduce more service population on the project site compared to the Project (see Table 5-2), the MT CO_2e per service population would be lower (which is more efficient, as measured by a rate of persons per unit of emissions annually). Therefore, the degree of effect regarding consistency with GHG emissions reduction plans and policies would be increased (more consistent) relative to the Project (Impact GHG-2).

Other Less-than-Significant Topics

Similar to the other residential alternatives (Alternatives 1A and 1B), Alternative 2 would result in the same or slightly increased degree of impacts for all other topics compared to the Project. Given its increased overall building height and operations compared to the Project, Alternative 2 may have slightly increased degree of the less-than-significant aesthetics effects, particularly regarding light and glare (Impact AES-3). Because Alternative 2 would result in substantially more population on the project site, including new residents, it would have a greater degree of effect related to inducing population growth (Impact POP-1), as well as demands for public services and recreational facilities (Impacts PSR-1, PSR-2, PSR-4, and REC-1), and utilities and services system demands (Impacts UTIL-1, UTIL-2, and UTIL-4).

Alternative 3: Office / Retail

Description

Uses/By Level

Alternative 3 considers 100,000 square feet of general office spaces built above 10,000 square feet of local-serving retail space on the ground/first level. Like each of the other alternatives, the tallest portions of the building would be five levels and approximately 60 feet tall above grade (compared to one-story with an upper-level parking deck and 40 feet tall with the Project; and compared to six levels and up to 75 feet tall with Alternatives 1A, 1B and 2). Alternative 3 assumes that the office space would cover the full building footprint to the building's edge; it would not be specially configured for natural light access as was done for the upper level residential units in Alternatives 1B and 2.

Retail and office parking would be provided on the ground/first and second levels, because it is assumed that the 201 parking spaces (34 retail and 167 office) could be combined and configured onto those two levels.

Access/Egress, Loading and Utilities

Like the Project, all vehicular access (office, retail, and service/delivery) would enter the site via 30th Street. Because the office and retail parking could be combined, there would be a single driveway for these vehicles, with separate driveway exit near the northeast corner of the site, as with the Project and each other alternative. The basic ramping and circulation would be like that described for the Project (see Figure 3-2 in Chapter 3, *Project Description*).

Setbacks/Frontages and Pedestrian Access

The ground-floor setback from the west property line would be 10 feet for the length of the project site and the height of the building (same as shown in Figure 5-3).

Alternative 3 would locate an office entrance lobby near the northeast corner of the site, with a retail plaza to the retail spaces, all of which would front on Broadway.

Alternative 3 Impacts Compared to Project's

Noise

Alternative 3 would generate fewer daily vehicle trips and fewer PM and Saturday peak hour vehicle trips than the Project, and would involve more construction than the Project given the addition of 100,000 square feet of general office space, even with the reduction of 26,000 square feet of total retail area (see Tables 5-1 and 5-2). Alternative 3 would continue to have the same less-than-significant noise impacts identified with the Project, and the traffic noise effect in particular would occur at a lesser degree given the fewer number of vehicle trips.

Transportation and Circulation

As described above for Noise, Alternative 3 would generate fewer daily vehicle trips and fewer PM and Saturday peak hour vehicle trips than the Project. Given the amount of reduction, Alternative 3 would not avoid the **significant and unavoidable** traffic impact identified at the intersection of *27th Street/24th Street/Bay Place/Harrison Street* during the PM peak hour with the Project (Impact TRANS-3). However, Alternative 3 would avoid the need for mitigation measures at this intersection to address the impact that occurs during the Saturday peak hour; with Alternative 3, the Saturday peak hour impact would be less than significant with no mitigation required.

Alternative 3 also would result in the same impact determinations for all other traffic topics, decreasing the degree of all the less-than-significant (with mitigations) effects given the reduced peak-hour trips compared to the Project.

Air Quality

Alternative 3 would generate the fewest number of daily vehicle trips and Saturday peak hour vehicle trips compared to the Project and most of the alternatives. It would continue to have the same less-than-significant air quality impacts as identified with the Project. Notably reduced effects would occur for the less-than-significant effects of ROG and NOx, as these emissions would be less than with the Project (see Table 5-1). Alternative 3 would continue to have a greater degree of construction air quality effects compared to the Project given the increased extent and duration of construction. Lastly, Alternative 3 would not introduce sensitive receptors.

Greenhouse Gases and Climate Change

Because Alternative 3 would generate substantially fewer but longer overall vehicle trips (although more overall GHG source emissions) than the Project, it would still generate slightly more MT of CO_2e annually than the Project (see Table 5-2). Therefore, it would continue to have the same conservatively **significant and unavoidable** GHG impact as identified with the Project (Impact GHG-1).

Because Alterative 3 would introduce more service population on the project site compared to the Project, the MT CO_2e per service population would be lower (see Table 5-2) (which is more efficient, as measured by a rate of persons per unit of emissions annually).Therefore, the consistency with GHG emissions reduction plans and policies would be increased (more consistent) relative to the Project (Impact GHG-2).

Other Less-than-Significant Topics

Alternative 3 would result in the same or slightly increased or decreased degree of impacts for all other topics compared to the Project. Given its increased overall building height (although possibly one level lower than Alternatives 1A, 1B, and 2) and operations compared to the Project, Alternative 3 may have slightly increased effects regarding light and glare (Impact AES-3). Because Alternative 3 would result in substantially more population on the project site, primarily daytime employment population, it would have a greater degree of effect related to inducing indirect population growth (Impact POP-1), as well as indirect demands for public services and recreational facilities (Impacts PSR-1, PSR-2, PSR-4, and REC-1), and utilities and services system demands (Impacts UTIL-1, UTIL-2, and UTIL-4).

Alternative 4: Fully Mitigated / Grocery Only

Description

Uses/By Level

Alternative 4 considers a 20,000 square-foot grocery store. No local-serving retail space or other uses would occur on the project site, except for circulation and operations spaces necessary to support the grocery store. Alternative 4 would be configured like the Project, with an upper parking level of 100 spaces. Compared to the Project, Alternative 4 has 16,000 fewer square feet and 58 fewer parking spaces. This could allow the development to be configured with a smaller footprint, allowing some portion of the project site to be improved but not built on – for example by introducing an improved surface parking area with stormwater improvement (e.g. permeable pavement, biofiltered islands) or an outdoor gathering space. This is a conservative and conceptual assumption given the physical constraints presented by the relative shallow depth of the site (east to west) and the dimensional requirements necessary for the grocery store operations and circulation.

Access/Egress, Loading and Utilities

Like the Project, the retail and service/delivery access would enter the site via 30th Street, and the loading dock and service/delivery truck exit would be near the northeast corner of the site.

Setbacks/Frontages and Pedestrian Access

At least a 10-foot to approximately 24-foot building setback from the west property line is assumed for Alternative 4 (like the Project), even though, conceptually, additional setback could be gained on the west or north edge of the site with a configuration of the building's footprint. As mentioned above, while the structure could be configured to cover less of the project site, the building would be built to the 30th and Broadway frontages, consistent with urban design principals and zoning.

Alternative 4 Impacts Compared to Project's

Noise

Alternative 4 would generate fewer daily and peak hour vehicle trips and involve slightly less construction activity than the Project given that there would be 16,000 less square feet of total retail area (see Tables 5-1 and 5-2). With this substantial net reduction, Alternative 4 would continue to have the same less-than-significant noise impacts identified with the Project, and the degree of effects would be less for all noise topics: construction noise, traffic noise, and other operational noise.

Transportation and Circulation

As described above for Noise, Alternative 4 would generate fewer daily vehicle trips and fewer PM and Saturday peak hour vehicle trips than the Project. This reduction, particularly in the PM peak hour (see Table 5-2) would allow Alternative 4 to avoid the **significant and unavoidable** traffic impact identified at the intersection of *27th Street/24th Street/Bay Place/Harrison Street* during the PM peak hour with the Project (Impact TRANS-3). The impact would be reduced to less than significant; no mitigation measure would be required.

Alternative 4 also would result in the same impact determinations for all other traffic topics, decreasing the degree of all the less-than-significant (with mitigations) effects given the reduced peak-hour trips compared to the Project.

Air Quality

Alternative 4 would generate the fewest number of AM and PM peak hour vehicle trips compared to the Project and most of the alternatives (see Table 5-2). It would continue to have the same less-than-significant air quality impacts as identified with the Project for all the emissions factors. Alternative 4 would have a reduced degree of construction air quality effects (Impact NOI-1) compared to the Project, since it would involve slightly less construction than the Project. Lastly, Alternative 4 would not introduce sensitive receptors.

Greenhouse Gases and Climate Change

Because Alternative 4 would generate substantially fewer overall vehicle trips than the Project, it would generate less MT of CO_2e annually (see Table 5-2) and avoid the conservatively **significant unavoidable** GHG impact that would occur with the Project (Impact GHG-1). It would continue to have the same less-than-significant (with SCA) GHG impact as identified with the Project (Impact GHG-2).

Because Alterative 4 would introduce substantially less service population on the project site compared to the Project, the MT CO_2e per service population would be notably higher (see Table 5-2) (which is relatively less efficient, as measured by a rate of persons per unit of emissions annually). Given the single building development that would occur with Alternative 4, the consistency with GHG emissions reduction plans and policies would be reduced (less consistent) relative to the Project (Impact GHG-2).

Other Less-than-Significant Topics

Alternative 4 would result in the same or decreased degree of impacts for all other less-than-significant topics compared to the Project. This alternative would generally have the same building height, and extent of light and glare (Impact AES-3) and scenic resources (Impact AES-1), although the analysis acknowledges that there are no existing views from or across the project site that are considered scenic or unique. Because Alternative 4 would result in substantially less population on the project site, it would have a reduced effect to indirect population growth (Impact POP-1), as well as indirect demands for public services and recreational facilities (Impacts PSR-1, PSR-2, PSR-4, and REC-1), and utilities and services system demands (Impacts UTIL-1, UTIL-2, and UTIL-4).

5.5 Environmentally Superior Alternative

CEQA requires that the EIR identify an environmentally superior alternative (CEQA Guidelines, Section 15126.6), which is the CEQA alternative that avoids or substantially reduces to the greatest extent the significant environmental impacts identified for the project. The evaluation below considers the extent to which each of the alternatives addressed in this EIR reduces or avoids the significant and unavoidable impacts identified for the Project. The extent to which an alternative reduces or avoids the project's less-than-significant impacts is also considered, balanced by the relative degree to which the impact affects the physical environment. The City will consider the relative extent to which the alternatives support the basic objectives of the Project as it considers the merits of the Project.

As discussed in Section 5.4.2, *Description and Analysis of Alternatives,* the No Project Alternative would avoid all impacts identified with the Project for all environmental topics. CEQA requires that when the "no project" alternative emerges as the environmentally superior Alternative, a second alternative shall be identified as environmentally superior (CEQA Guidelines, Section 15126.6(e)). Therefore, after consideration of the No Project Alternative, Alternative 4 (Fully Mitigated / Grocery Only) is the environmentally superior alternative.

5.5.1 Alternative 4 (Fully Mitigated / Grocery Only)

Alternative 4 (Fully Mitigated / Grocery Only) is the environmentally superior alternative because it would avoid and substantially reduce the significant and unavoidable impact identified with the Project and that would continue to occur with each of the other alternatives (except the No Project Alternative, as discussed above). (The relative impacts for the Project compared to all of the alternatives are presented in Table 5-3 at the end of this chapter.)

Comparison of Significant and Unavoidable Impact

Alternative 4 would develop a total of 20,000 square feet of new grocery store and local-serving retail use, which is 6,000 square feet less than with the Project, and as much as 90,000 square feet less (of any type of use) than each of the other alternatives (of any use, specifically office use under Alternative 3). This reduction results in fewer vehicle trips generated from the project site – fewer enough to avoid the conservatively **significant and avoidable** Impact GHG-1 for greenhouse gas emissions from the Project and which would continue to occur with each of the other alternatives. The reduction in vehicle trips generated from the project site – fewer also is enough to avoid the **significant and avoidable** Impact TRANS-3 at the intersection of *27th Street/24th Street/Bay Place/Harrison Street* in 2035 which would continue occur with each of the other alternatives. Although Alternative 3: Office/Retail would generate the fewest total number of vehicle trips, it would not avoid Impact TRANS-3 given the differences in peak traffic patterns between the office and grocery store uses.

Comparison of Less-than-Significant Impacts

Although CEQA's consideration of an environmentally superior alternative focuses on the ability of an alternative to avoid or substantially reduce significant and unavoidable impacts identified with a project, a comparison of less-than-significant impacts is summarized here for context (full discussion previously presented under *Alternative 4* in Section 5.4.2).

Compared to each of the other alternatives, Alternative 4 would result in somewhat fewer AM and PM peak hour vehicle trips from the project site, less building development, construction activity, and on-site population. (Only Alternative 3: Office/Retail has fewer trips during the Saturday peak.) As a result, it would reduce to the overall greatest extent the Project's less-than-significant effects (including those that are less-than-significant *after mitigation* or *with SCAs*). These include reduced less-than-significant impacts for air quality emissions (Impacts AIR-1 and AIR-2), and traffic (Impacts TRANS-1, TRANS-2, TRANS-3 [Saturday peak hour only], and TRANS-4). It would also reduce the *degree* of most of the Project's less-than-significant impacts (as depicted by "down arrow" symbols in Table 5-3). Alternatives Considered but Not Analyzed Further in the EIR

5.5.2 Off-site Location

As discussed above in Section 5.3, *Alternatives Selected for Consideration*, a range of alternatives was selected for analysis in this EIR that consider greater densities, alternative land uses, and less development. In addition to the selected alternatives, an off-site location for the Project was considered but rejected from further consideration in this EIR for the reasons discussed below.

In considering the range of alternatives to be analyzed in an EIR, CEQA Guidelines states that an alternative site location should be considered when feasible alternative locations are available and the "significant effects of the project would be avoided or substantially lessened by putting the project in another location" (CEQA Guidelines, Section 15126.6(f)). The specific reasons for rejecting an off-site alternative include the following:

1) **Site Control.** The project sponsor does not control other property in the vicinity.

2) **Allowable Use.** Grocery stores are an appropriate and permissible land use on the project site, as established by the Oakland General Plan and Oakland zoning regulations, and an

alternative that would locate the Project on another site in the vicinity would not preclude the development of another grocery store or similar retail use on the site. No General Plan amendments or rezoning is required for the Project at the proposed location.

3) **Suitable Sites.** The project site is 1.9-acres (83,143 square feet). There are not any other existing undeveloped sites in the immediate project vicinity, with an arterial street frontage, and that have adequate size and dimensions to accommodate the circulation and operational characteristics necessary for the Project - even without considering the 10,000 square feet of additional local-serving retail proposed. Three sites were considered: (a) an approximately 0.86-acre (37,500 square feet) vacant triangular surface lot exists at 2849 Broadway; (b) a vacant surface lot exists at the southwest corner of 25th and Broadway which, if combined with a smaller vacant lot that abuts it to the west (and fronts 25th Street), would be approximately 0.82 acres (35,625 square feet); and (c) a 0.72-acre (31,250 square-foot) surface lot currently occupied by Honda of Oakland vehicle parking exists at the northwest corner of 34th and Broadway. None of these sites would accommodate development of a 26,000 square-foot grocery store and required space for service, parking and circulation.

   The consideration of possible off-site locations for the Project factored in the Project's basic objective to develop a Sprouts Farmers Market "on a portion of Broadway that currently lacks sufficient retail and pedestrian-friendly amenities." Development at this location in Oakland is a result of in-depth marketing analysis by the project sponsor. The assessment conducted for this EIR discussion did not consider whether the potential off-site locations are available for acquisition by the project sponsor since none met the basic size and dimensional requirements of the Project. This assessment also did not consider already developed sites, either as possible off-site locations by themselves (such as the Grocery Outlet site at the northeast corner of 29th and Broadway) or as part of a larger site assembly to create an alternative site of adequate size and dimension and location (such as locations in the area of 24th and Valdez Streets).

4) **Unlikely SU Impact Avoidance.** While possible, it is unlikely that the significant and unavoidable impact identified with the Project would be avoided by developing the Project at an alternative nearby location. Any sizeable development in the project vicinity would likely exceed the GHG emissions thresholds and worsen the significant and unavoidable *27th Street/24th Street/Bay Place/Harrison Street intersection*, which would already operate at LOS F in 2035; Alternative 4: Fully Mitigated / Grocery Only would avoid these significant impacts by developing only a 20,000 square-foot grocery store. Moreover, similar traffic impacts would likely result at different intersections in proximity to any possible alternative site in the vicinity, of which none were identified (see reason #3, above).

For these reasons, the consideration of an off-site location was considered infeasible and was rejected for further evaluation in this EIR.

5.6 Summary of Comparative Impacts

Table 5-3, **Summary of Impacts Identified with the Project and the Alternatives**, starting on the following page summarizes the impacts of the Project and each of the alternatives analyzed. The table specifically highlights (in **bold underlined** format) cases where an alternative avoids or otherwise results in a different impact *determination* (i.e., less-than-significant, less-than-significant after mitigation, or significant and unavoidable) than that identified with the Project. Notable differences in relative degree (e.g., “more/greater than/increased” or “less than/reduced”) of environmental effect are also noted by arrow symbols, where relevant.

TABLE 5-3
SUMMARY OF IMPACTS IDENTIFIED WITH THE PROJECT AND THE ALTERNATIVES

			Reduced Project + Residential				
	Project	**No Project (No Change to Existing Conditions)**	**1A: Mixed Use 150** ***(150 Units + Grocery/Local Retail)***[a]	**1B: Mixed Use 225** ***(225 Units + Grocery/Local Retail)*** [a]	**2: Mixed Use 225/No Grocery** ***(225 Units + Local Retail)***	**3: Office/Retail** ***(Office + Local Retail)***	**4: Fully Mitigated / Grocery Only**
Aesthetics							
Impact AES-1: The Project would not adversely affect scenic public vistas or views of scenic resources (Criteria 1 and 2).	LS	N	LS⇧	LS⇧	LS⇧	LS⇧	LS
Impact AES-2: The Project would not substantially degrade the existing visual character or quality of the site and its surroundings (Criterion 3).	LS	N (Less beneficial than with Project or alternatives)	LS	LS	LS	LS	LS
Impact AES-3: The Project would result in new sources of light or glare which would not substantially and adversely affect day or nighttime views in the area (Criterion 4).	LSS	N	LSS⇧	LSS ⇧	LSS ⇧	LSS⇧	LSS
Impact AES-4: The Project, in combination with other past, present, and reasonably foreseeable future projects within and around the project vicinity, would result in less-than-significant cumulative aesthetics effects.	LSS	N	LSS	LSS	LSS	LSS	LSS
Air Quality							
Impact AIR-1: Construction of the Project would not result in average daily emissions of 54 pounds per day of ROG, NO_X, or $PM_{2.5}$ or 82 pounds per day of PM_{10}. (Criterion 1)	LSS	N	LSS⇧	LSS⇧	LSS⇧	LSS⇧	LSS
Impact AIR-2: The Project would not result in operational average daily emissions of more than 54 pounds per day of ROG, NO_X, or $PM_{2.5}$ or 82 pounds per day of PM_{10}; or result in maximum annual emissions of 10 tons per year of ROG, NO_X, or $PM_{2.5}$ or 15 tons per year of PM_{10}. (Criterion 2)	LS	N	LS⇧	LS⇧	LS⇧	LS⇩ (ROG and NOx only)	LS⇩ (All emissions factors)
Impact AIR-3: The Project would not contribute to carbon monoxide (CO) concentrations exceeding the California Ambient Air Quality Standards (CAAQS) of nine parts per million (ppm) averaged over eight hours and 20 ppm for one hour.	LS	N	LS⇧	LS⇧	LS⇧	LS⇩	LS⇩

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TABLE 5-3 (Continued)
SUMMARY OF IMPACTS IDENTIFIED WITH THE PROJECT AND THE ALTERNATIVES

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Air Quality (cont.)							
Impact AIR-4: The Project would not expose persons to substantial levels of Toxic Air Contaminants (TACs) resulting in (a) a cancer risk level greater than 10 in one million, (b) a non-cancer risk (chronic or acute) hazard index greater than 1.0, or (c) an increase of annual average $PM_{2.5}$ of greater than 0.3 micrograms per cubic meter by siting a new source or a new sensitive receptor. (Criterion 4)	LS	N	LSS⇧	LSS⇧	LSS⇧	LS	LS
Impact AIR-5: The Project would not frequently and for a substantial duration, create or expose sensitive receptors to substantial objectionable odors affecting a substantial number of people. (Criterion 5)	LS	N	LS	LS	LS	LS	LS
Impact AIR-6: The Project would not expose persons, by siting a new source or a new sensitive receptor, to substantial levels of TACs resulting in (a) a cumulative cancer risk level greater than 100 in a million, (b) a cumulative non-cancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 micrograms per cubic meter. (Criterion 6)	LS	N	LSS⇧	LSS⇧	LSS⇧	LS	LS
Biological Resources							
Impact BIO-1: The Project could fundamentally conflict with the City of Oakland Tree Protection Ordinance (Oakland Municipal Code Chapter 12.36) by removal of protected trees under certain circumstances (Criterion 6).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact BIO-2: Construction activity and operations of the Project, in combination with past, present, existing, approved, pending and reasonably foreseeable future projects in the project vicinity, would not result in impacts on special-status species, sensitive habitats, wildlife movement corridors, wetlands, and other waters of the U.S.	LSS	N	LSS	LSS	LSS	LSS	LSS

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D. Cultural and Paleontological Resources							
Impact CUL-1: The Project would not result in the physical demolition, destruction, relocation, or alteration of historical resources that are listed in or may be eligible for listing in the federal, state, or local registers of historical resources (Criterion 1).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact CUL-2: The Project could result in significant impacts to unknown archaeological resources (Criterion 2).	LSS	N	LSS⇧	LSS	LSS	LSS	LSS
Impact CUL-3: The Project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (Criterion 3).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact CUL-4: The Project could disturb human remains, including those interred outside of formal cemeteries (Criterion 4).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact CUL-5: The Project, combined with cumulative development in the project vicinity and citywide, including past, present, existing, approved, pending, and reasonably foreseeable future development within and around the Project, would not result in a significant adverse impact to cultural resources.	LSS	N	LSS	LSS	LSS	LSS	LSS
Geology, Soils, and Seismicity							
Impact GEO-1: The Project could expose people or structures to seismic hazards such as ground shaking and seismic-related ground failure such as liquefaction, differential settlement, collapse, or lateral spread (Criteria 1 through 4).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact GEO-2: The Project could be subjected to geologic hazards, including expansive soils, subsidence, seismically-induced settlement and differential settlement (Criterion 7).	LSS	N	LSS	LSS	LSS	LSS	LSS

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Geology, Soils, and Seismicity (cont.)							
Impact GEO-3: The Project, when combined with other past, present, existing, approved, pending and reasonably foreseeable development in the vicinity, would not result in significant cumulative impacts with respect to geology, soils or seismicity.	LSS	N	LSS	LSS	LSS	LSS	LSS
Greenhouse Gases and Climate Change							
Impact GHG-1: The Project would produce greenhouse gas emissions that exceed 1,100 metric tons of CO_{2e} per year, that would exceed 4.6 metric tons of CO_2e per service population annually (Criterion 1).	SU	N	SU⇧	SU⇧	SU⇧	SU⇧	**LS** (Less than significance threshold)
Impact GHG-2: The Project would not conflict with an applicable plan, policy or regulation of an appropriate regulatory agency adopted for the purpose of reducing greenhouse gas emissions (Criterion 2).	LSS	N	LSS⇩	LSS⇩	LSS⇩	LSS⇩	LSS⇧
Hazards and Hazardous Materials							
Impact HAZ-1: The Project would result in an increase in the routine transportation, use, and storage of hazardous chemicals, however, no significant public hazard would result (Criteria 1 and 3).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact HAZ-2: The Project would result in the accidental release of hazardous materials used during construction through improper handling or storage, however, compliance with regulatory requirements will ensure no significant public hazard would result (Criterion 2).	LSS	N	LSS	LSS	LSS	LSS	LSS

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Hazards and Hazardous Materials (cont.)							
Impact HAZ-3: The Project could result in the exposure of hazardous materials in soil and ground water, however, compliance with regulatory requirements will ensure no significant public hazard would result (Criteria 2 and 5).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact HAZ-4: The Project could result in the exposure of hazardous building materials during building demolition, however, compliance with regulatory requirements will ensure no significant public hazard would result (Criterion 2).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact HAZ-5: The Project would require use of hazardous materials within 0.25 mile of a school, however, compliance with regulatory requirements will ensure that no significant public hazard would result (Criteria 3 and 4).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact HAZ-6: The Project would not result in fewer than two emergency access routes for streets exceeding 600 feet in length and would not physically interfere with an adopted emergency response plan or emergency evacuation plan (Criteria 6 and 9).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact HAZ-7: The Project, when combined with other past, present, existing, approved, pending and reasonably foreseeable development in the vicinity, would not result in a significant cumulative hazards.	LSS	N	LSS	LSS	LSS	LSS	LSS
Hydrology and Water Quality							
Impact HYD-1: The Project would alter drainage patterns and increase the volume of stormwater, or the level of contamination or siltation in stormwater flowing from the project site, however, compliance with applicable regulatory requirements will ensure that no significant impacts would result (Criteria 1, 3 through 7, and 12).	LSS	N (Less beneficial than with Project or alternatives)	LSS	LSS	LSS	LSS	LSS

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Hydrology and Water Quality (cont.)							
Impact HYD-2: The Project could be susceptible to flooding hazards in the event of dam or reservoir failure (Criteria 10 and 11).	LS	N	LS	LS	LS	LS	LS
Impact HYD-3: The Project would not be susceptible to inundation in the event of sea-level rise (Criterion 11).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact HYD-4: The Project would not adversely affect the availability of groundwater supplies or interfere substantially with groundwater recharge (Criterion 2)	LS	N	LS	LS	LS	LS	LS
Impact HYD-5: The Project would not be susceptible to mudflow, seiche, and tsunami-related hazards (Criterion 11).	LS	N	LS	LS	LS	LS	LS
Impact HYD-6: The Project, combined with past, present, existing, approved, pending, and reasonably foreseeable future projects would not result in potentially significant cumulative impacts to hydrologic resources.	LSS	N	LSS	LSS	LSS	LSS	LSS
Land Use, Plans, and Policies							
Impact LU-1: The Project would not result in the physical division of an existing community or conflict with adjacent or nearby land uses (Criteria 1 and 2). (Less than Significant)	LS	N	LS	LS	LS	LS	LS
Impact LU-2: The Project would not conflict with applicable land use plans and policies adopted for the purpose of avoiding or mitigating an environmental effect (Criterion 3).	LS	N	LS	LS	LS	LS	LS
Impact LU-3: The Project would not fundamentally conflict with any applicable habitat conservation plan or natural community conservation plan (Criterion 4).	LS	N	LS	LS	LS	LS	LS

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Land Use, Plans, and Policies (cont.)							
Impact LU-4: The Project, combined with cumulative development in the defined geographic area, including past, present, existing, approved, pending, and reasonably foreseeable future development, does not result in any significant adverse cumulative impacts in the area.	LS	N	LS	LS	LS	LS	LS
Noise							
Impact NOI-1: The Project would not result in substantial temporary or periodic increases in ambient noise levels in the project area above existing levels without the Project and in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (Criteria 1, 2 and 8).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact NOI-2: The Project would not increase operational noise levels in the project area to levels in excess of standards established in the Oakland Noise Ordinance and Planning Code (Criterion 3).	LSS	N	LSS⇧	LSS⇧	LSS⇧	LSS⇧	LSS
Impact NOI-3: The Project would not expose persons to exterior noise levels in conflict with the land use compatibility guidelines of the Oakland General Plan after incorporation of all applicable Standard Conditions of Approval (Criterion 6).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact NOI-4: The Project would not expose persons to interior Ldn or CNEL greater than 45 dBA for multi-family dwellings, hotels, motels, dormitories and long-term care facilities to noise levels in excess of standards established in the Oakland Noise Ordinance and Planning Code (Criterion 5).	LS	N	LS⇧	LS⇧	LS⇩	LS⇩	LS

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Noise (cont.)							
Impact NOI-5: Traffic generated by Project could substantially increase traffic noise levels in the project area (Criterion 4).	LS	N	LS⇧	LS⇧	LS⇩	LS⇩	LS⇩
Impact NOI-6: Traffic generated by the Project, in combination with traffic from past, present, existing, approved, pending and reasonably foreseeable future projects, could substantially increase traffic noise levels in the project area; and construction and operational noise levels in combination with traffic from past, present, existing, approved, pending and reasonably foreseeable future projects, could increase ambient noise levels (Criterion 4).	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact NOI-7: Stationary noise sources such as rooftop mechanical equipment in combination with traffic generated by the Project; and from past, present, existing, approved, pending and reasonably foreseeable future projects; could substantially increase noise levels at sensitive land uses in the project area; (Criterion 4).	LS	N	LS⇧	LS⇧	LS	LS	LS
Population, Housing, and Employment							
Impact POP-1: The Project would not induce substantial population growth in a manner not contemplated in the General Plan, either directly or indirectly (Criterion 1).	LS	N	LS⇧	LS⇧	LS⇧	LS	LS
Public Services and Recreation							
Impact PSR-1: The Project could result in an increase in calls for police services, but would not require new or physically altered police facilities in order to maintain acceptable performance objectives (Criterion 1).	LS	N	LS⇧	LS⇧	LS⇧	LS⇧	LS

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Public Services and Recreation (cont.)							
Impact PSR-2: The Project could result in an increase in calls for fire protection and emergency medical response services, but would not require new or physically altered fire protection facilities in order to maintain acceptable performance objectives (Criterion 1).	LSS	N	LSS⇧	LSS⇧	LSS⇧	LSS⇧	LSS
Impact PSR-3: The Project, in combination with other past, present, existing, approved, pending, and reasonably foreseeable future projects within and around the project site, would not result in a cumulative increase in demand for police, fire, and school services.	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact PSR-4: The Project could result in new students for local schools, but would not require new or physically altered school facilities to maintain acceptable performance objectives (Criterion 1).	LS	N	LS⇧	LS⇧	LS⇧	LS	LS
Recreation							
Impact REC-1: The Project could increase the use of existing neighborhood or regional parks or other recreational facilities, but not such that substantial physical deterioration of the facility would occur or be accelerated, or cause the need for new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios (Recreation Criterion 1 and Public Services Criterion 1).	LS	N	LS⇧	LS⇧	LS⇧	LS⇧	LS
Transportation and Circulation							
Impact TRANS-1: The Project would increase the V/C ratio for a critical movement by 0.05 or more (Significant Threshold #5) during the weekday PM peak hour at the *Piedmont Avenue/Hawthorne Avenue/Brook Street/Broadway* intersection (#6), which would operate at LOS F under 2035 conditions.	LSM	N	LSM⇧	LSM⇧	LSM⇩	LSM⇩	LSM⇩

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Transportation and Circulation (cont.)							
Impact TRANS-2: The Project would increase the total intersection v/c ratio by 0.03 or more and increase the V/C ratio for a critical movement by 0.05 or more during the weekday PM peak hour (Significant Threshold #5) at the *27th Street/Broadway* intersection (#10), which would operate at LOS F under 2035 conditions.	LSM	N	LSM ⇧	LSM ⇧	LSM ⇩	LSM ⇩	LSM ⇩
Impact TRANS-3: The Project would increase the v/c ratio for a critical movement by 0.05 or more (Significant Threshold #5) during the weekday PM peak hour and increase the total intersection V/C ratio by 0.03 or more and increase the V/C ratio for a critical movement by 0.05 or more during the Saturday peak hour (Significant Threshold #5) at the *27th Street/24th Street/Bay Place/Harrison Street* (#11) intersection, which would operate at LOS F under 2035 conditions.	SU (PM peak hour) LSM (Saturday peak hour)	N	SU ⇧ (PM peak hour) LSM ⇧ (Saturday peak hour)	SU ⇧ (PM peak hour) LSM ⇧ (Saturday peak hour)	SU ⇩ (PM peak hour) LSM ⇩ (Saturday peak hour)	SU ⇩ (PM peak hour) **LS** (Saturday peak hour)	**LS** (PM peak hour) **LS** (Saturday peak hour)
Impact TRANS-4: The Project would increase the total intersection v/c ratio by 0.03 or more and increase the v/c ratio for a critical movement by 0.05 or more during the weekday PM peak hour (Significant Threshold #5) at the *Grand Avenue/ Broadway* intersection (#12), which would operate at LOS F under 2035 conditions.	LSM	N	LSM ⇧	LSM ⇧	LSM ⇩	LSM ⇩	LSM ⇩
Utilities and Service Systems							
Impact UTIL-1: The water demand generated by the Project would not exceed water supplies available from existing entitlements and resources (Criterion 3).	LS	N	LS ⇧	LS ⇧	LS ⇧	LS ⇧	LS
Impact UTIL-2: The Project would not exceed the wastewater treatment requirements of the San Francisco Regional Water Quality Control Board or result in a determination that new or expanded wastewater treatment facilities would be required (Criteria 1 and 4).	LSS	N	LSS ⇧	LSS ⇧	LSS ⇧	LSS ⇧	LSS

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Utilities and Service Systems (cont.)							
Impact UTIL-3: The Project would not require or result in construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects (Criteria 2).	LSS	N (Less beneficial than Project or alternatives)	LSS	LSS	LSS	LSS	LSS
Impact UTIL-4: The Project would not violate applicable federal, state, and local statutes and regulations related to solid waste; nor generate solid waste that would exceed the permitted capacity of the landfills serving the area (Criteria 5 and 6).	LSS	N	LSS⇧	LSS⇧	LSS⇧	LSS⇧	LSS
Impact UTIL-5: The Project would not violate applicable federal, state and local statutes and regulations relating to energy standards; nor result in a determination by the energy provider which serves or may serve the area that it does not have adequate capacity to serve projected demand in addition to the providers' existing commitments and require or result in construction of new energy facilities or expansion of existing facilities (Criteria 7 and 8). (Less than Significant)	LSS	N	LSS	LSS	LSS	LSS	LSS
Impact UTIL-6: The Project in combination with other past, present, existing, approved, pending, and reasonably foreseeable future projects within and around the Project would result in an increased demand for utilities services. (Less than Significant)	LSS	N	LSS	LSS	LSS	LSS	LSS
Other Less-than-Significant Impacts							
The Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency to non-agricultural use (Criterion 1).	N	N	N	N	N	N	N

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Other Less-than-Significant Impacts (cont.)							
The Project would not involve any changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use (Criterion 5).	N	N	N	N	N	N	N
The Project would not conflict with existing zoning for agricultural use, or a Williamson Act contract (Criterion 2).	N	N	N	N	N	N	N
The Project would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)); nor result in the loss of forest land or conversion of forest land to non-forest use (Criteria 3 or 4).	N	N	N	N	N	N	N
The Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; nor result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan (Criteria 1 and 2).	N	N	N	N	N	N	N
The Project would not displace substantial numbers of existing housing or people, necessitating the construction of replacement housing elsewhere in excess of that contained in the City's Housing Element (Criteria 2 and 3).	N	N	N	N	N	N	N
The Project does not include recreational facilities or require the construction or expansion of recreational facilities which might have a substantial adverse physical effect on the environment (Criterion 2).	N	N	N	N	N	N	N

N No Impact
LS Less than significant; no mitigation required
LSS Less than significant with Standard Conditions of Approval (SCA)
LSM Less than significant impact after mitigation
SU Significant and unavoidable
⇧⇩ Impact is more severe (⇧) or less severe (⇩) than the Project's impact, but impact determination is the same
Bold indicates impact differs from Project's impact

CHAPTER 6

Impact Overview and Growth Inducement

As required by the California Environmental Quality Act (CEQA), this chapter discusses the following types of impacts that could result from implementation of the Project: significant unavoidable impacts, growth-inducing impacts, significant irreversible changes, and effects found not to be significant.

6.1 Significant and Unavoidable Impacts

A significant and unavoidable impact would result if a project were to reach or exceed the defined threshold of significance and no feasible mitigation measure was available to reduce the significant impact to a less-than-significant level. The Project would result in the following significant and unavoidable (SU) impacts, as identified throughout Chapter 4 of this EIR.

- **Impact GHG-1: The Project would produce greenhouse gas emissions that exceed 1,100 metric tons of CO2e per year and that would exceed 4.6 metric tons of CO2e per service population annually.**

  As discussed in Section 4.6, *Greenhouse Gases and Climate Change*, in Chapter 4 of this EIR, the Project would exceed the quantitative GHG emissions significance thresholds and therefore would implement GHG SCA 1, *Greenhouse Gas Reduction Plan*. All feasible GHG reduction measures have been factored into or considered for the Project, and the purchase of carbon offsets by the project applicant is required to reduce the Project's incremental GHG emissions above 1,100 MT of CO_2e per year (approximately 411 MT CO_2e per year) and meet the requirements of GHG SCA 1. Because the ongoing feasibility of this measure to be implemented by the project applicant is cannot be certain in the future (due to the inability to foresee with certainty the future market for and cost of purchasing carbon credits over time), this impact is conservatively considered significant and unavoidable.

- **Impact TRANS-3: The Shops at Broadway Project would increase the v/c ratio for a critical movement by 0.05 or more (Significant Threshold #5) during the weekday PM peak hour and increase the total intersection v/c ratio by 0.03 or more and increase the v/c ratio for a critical movement by 0.05 or more during the Saturday peak hour (Significant Threshold #5) at the 27th Street/24th Street/Bay Place/Harrison Street (#11) intersection, which would operate at LOS F under 2035 conditions.**

  As discussed in Section 4.12, *Transportation and Circulation,* in Chapter 4 of this EIR, mitigation measures consistent with the recommendations of the Harrison Street/Oakland

Avenue Community-Based Transportation Plan (CBTP) completed in 2010 (as discussed in Section 4.12) are identified (Mitigation Measure TRANS-3). However, after its implementation, the intersection would continue to operate at conditions considered significant for LOS and for the v/c ratio for critical movements. No other feasible mitigation measures are available that would mitigate the project impacts.

6.2 Growth-Inducing Impacts

The Project does not propose to construct new housing that would induce direct population growth. The estimated increase in employment at the Project site (approximately 76 employees) is not so large as to induce substantial population growth, and employees for the Project can be found from within the existing available local labor force. The Project does not require the extension of any roads or other infrastructure that would lead to growth inducing impacts that were not previously considered or analyzed in the General Plan and its associated EIR.

6.3 Significant Irreversible Environmental Effects

An EIR must identify any significant irreversible environmental changes that could result from adoption and development under the Specific Plan. These may include current or future uses of non-renewable resources, and secondary or growth-inducing impacts that commit future generations to similar uses. CEQA dictates that irretrievable commitments of resources should be evaluated to assure that such current consumption is justified (CEQA Guidelines §15126.2(c)). The CEQA Guidelines identify three distinct categories of significant irreversible changes, each of which is addressed as follows:

(1) Changes in Land Use That Would Commit Future Generations

Because the Project would occur on an infill site on land designated for commercial uses, it would not commit future generations to a significant change in land use.

(2) Irreversible Changes from Environmental Accident

No significant environmental damage, such as what could occur as a result of an accidental spill or explosion of hazardous materials, is anticipated due to implementation of the proposed Project. Furthermore, compliance with federal, State and local regulations, the City of Oakland’s Standard Conditions of Approval, would reduce to a less-than-significant level the possibility that hazardous substances within the Project site would cause significant environmental damage (see Section 4.7, *Hazards and Hazardous Materials*, in Chapter 4 of this EIR).

(3) Consumption of Non-Renewable Resources

Consumption of non-renewable resources includes conversion of agricultural lands, loss of access to mining reserves, and use of non-renewable energy resources. The project site is located within an urban area of Oakland; no agricultural land would be converted to non-agricultural uses. The Project site does not contain known mineral resources, and does not serve as a mining reserve. (See *Agriculture and Forestry Resources* and *Mineral Resources*, discussed in Section 4.14, *Other Less-than-Significant Effects*, in Chapter 4 of this EIR.)

Construction of the Project would require the use of energy, including energy produced from nonrenewable sources. Energy consumption would also occur after the Project is operational, due to the use of automobiles and appliances associated with the Project. However, the Project would incorporate energy-conserving features, as required by the Uniform Building Code and the California Energy Code Title 24. Additionally, the location of the Project site near transit facilities would facilitate the increased use of public transit, further reducing non-renewable energy consumption associated with single-occupant vehicles.

6.4 Effects Found Not To Be Significant

The July, 27, 2012 Notice of Preparation (NOP) for this EIR (included in Appendix A to this EIR) did not include an Initial Study Checklist and therefore did not identify any environmental topics as being specifically screened out for potential adverse environmental effects. The NOP indicated there would likely be environmental effects on Air Quality, Cultural Resources, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Noise, and Traffic and Transportation. These environmental topics have been fully analyzed in Chapter 4 of this EIR.

The NOP did indicate that Agriculture and Forestry Resources; Mineral Resources; Population, Housing and Employment; Public Services; and Recreation were among several environmental factors that were not anticipated to have an environmental effect as a result of the Project, but that nevertheless would be analyzed in the EIR. These topics are addressed in Section 4.14, *Other Less-than-Significant Effects*, in Chapter 4 of this EIR because they were not anticipated to rise to a level of significance. Certain topics under Public Services (police services, and fire protection and emergency medical response) are addressed in Section 4.11, *Public Services*, in Chapter 4 of this document; the remaining public services topics addressed by the City of Oakland (public schools and parks usage) are addressed in Section 4.14.

6.5 References

City of Oakland, 2007. *Land Use and Transportation Element of the Oakland General Plan*, March 24, 1998, amended June 21, 2007.

City of Oakland, 1996. *Open Space, Conservation and Recreation (OSCAR), An Element of the Oakland General Plan*, adopted June 11, 1996.

California Department of Conservation, Map of Prime Farmland in Alameda County, 2011.

Stinson, M. C., M. W. Manson, J. J. Plappert, and others, Mineral Land Classification: Aggregate Materials in the San Francisco-Monterey Bay Area, Part II, Classification of Aggregate Resource Areas South San Francisco Bay Production-Consumption Region, California Division of Mines and Geology Special Report 146, 1982.

CHAPTER 7
Report Preparers

7.1 Lead Agency

City of Oakland
Department of Planning and Building
Planning and Zoning Division
250 Frank H. Ogawa Plaza, Suite 2114
Oakland, California 94612

Peterson A. Vollman, Planner III
Darin Ranelletti, Planner III

7.2 EIR Consultants

Environmental Science Associates
350 Frank H. Ogawa Plaza, Suite 300
Oakland, California 94612

Project Director: Crescentia Brown, AICP
Project Manager: Elizabeth Kanner — Deputy Project Manager: Nicole Proiette

ESA Technical Analysts:	Rebecca Allen, *Cultural Resources* Brad Brewster, *Cultural Resources* Crescentia Brown, AICP, *Aesthetics; Land Use, Plans, and Policies; Other Less-than-Significant Effects; Alternatives; Impact Overview and Growth Inducement* Jack Hutchison, *Traffic and Circulation peer review* Elizabeth Kanner, *Biological Resources; Geology, Soils and Geohazards; Hazardous Materials; Hydrology and Water Quality; Public Services; Utilities and Service Systems* Heidi Koenig, *Cultural Resources* Erin Higbee-Kollu, *Biological Resources; Geology, Soils and Geohazards; Hazardous Materials; Hydrology and Water Quality; Public Services; Utilities and Service Systems* Tim Rimpo, *Air Quality (Health Risk)* Chris Sanchez, *Air Quality; Greenhouse Gases; Noise* Joshua Smith, *Air Quality; Greenhouse Gases* Terrance Wong, *Roadway Noise; Greenhouse Gases (refrigerants)*
ESA Graphics, Production and Editing:	Lisa Bautista, Word Processing Anthony Padilla, Production Ron Teitel, Graphics

Transportation Consultant

Fehr & Peers
1333 Broadway
Oakland, CA 94612

Sam Tabibnia, PE, Traffic Engineer

APPENDIX A
Notice of Preparation and Summary of Scoping Comments

CITY OF OAKLAND

Department of Planning, Building and Neighborhood Preservation
250 Frank H. Ogawa Plaza, Suite 3315, Oakland, California, 94612-2032

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE SHOPS AT BROADWAY DEVELOPMENT PROJECT

The City of Oakland's Department of Planning, Building and Neighborhood Preservation is preparing a Draft Environmental Impact Report ("EIR") for **The Shops at Broadway** (the "Project") as identified below, and is requesting comments on the scope and content of the EIR. The EIR will address the potential physical, environmental effects for each of the environmental topics outlined in the California Environmental Quality Act ("CEQA"). The City has not prepared an Initial Study.

The City of Oakland is the Lead Agency for the Project and is the public agency with the greatest responsibility for approving the Project or carrying it out. This notice is being sent to Responsible Agencies and other interested parties. Responsible Agencies are those public agencies, besides the City of Oakland, that also have a role in approving or carrying out the Project. When the Draft EIR is published, it or a Notice of its Availability/Release will be sent to all Responsible Agencies and to others who respond to this Notice of Preparation ("NOP") or who otherwise indicate that they would like to receive a copy. Responses to this NOP and any questions or comments should be directed in writing to: Darin Ranelletti, Planner III, City of Oakland, Department of Planning, Building and Neighborhood Preservation, 250 Frank H. Ogawa Plaza, Suite 3315, Oakland, CA 94612; (510) 238-3663 (phone); (510) 238-6538 (fax); or dranelletti@oaklandnet.com (e-mail). The comment period for the NOP will begin on August 1, 2012. Comments on the NOP must be received by 5:00 p.m. on **August 31, 2012**. Please reference case number ER120007 in all correspondence. In addition, comments may be provided at the EIR Scoping Meeting to be held before the City Planning Commission. Comments should focus on discussing possible impacts on the physical environment, ways in which potential adverse effects might be minimized, and alternatives to the project in light of the EIR's purpose to provide useful and accurate information about such factors.

PUBLIC HEARING:

The City Planning Commission will conduct a public hearing on the scope of the EIR for the Project on **August 29, 2012**, at **6:00 p.m.** in the Sgt. Mark Dunakin Hearing Room (Hearing Room 1), Oakland City Hall, 1 Frank H. Ogawa Plaza, Oakland, CA.

PROJECT TITLE: The Shops at Broadway

PROJECT LOCATION: 3001-3039 Broadway, Oakland, CA (APNs 009-0705-004-00; 009-0705-005-00; 009-0705-006-00; & 009-0705-007-00; northwest corner of Broadway and 30th Street) (see map on reverse). The project site is located in the proposed Broadway Valdez District Specific Plan (BVDSP) area, which is currently undergoing its own separate and independent planning and CEQA process. However, the BVDSP will be considered in the cumulative analysis of the proposed Project.

PROJECT SPONSOR: Portfolio Development Partners LLC

EXISTING CONDITIONS: The approximately 83,000 sq. ft. project site is currently an asphalt-paved parking lot. The site is bound by Broadway to the east, 30th Street to the south, Webster Street to the west, and a car dealership to the north. The General Plan designation for the site is Community Commercial and the applicable zoning is CC-2/D-BR. The project site is not listed on the Cortese List of hazardous waste sites.

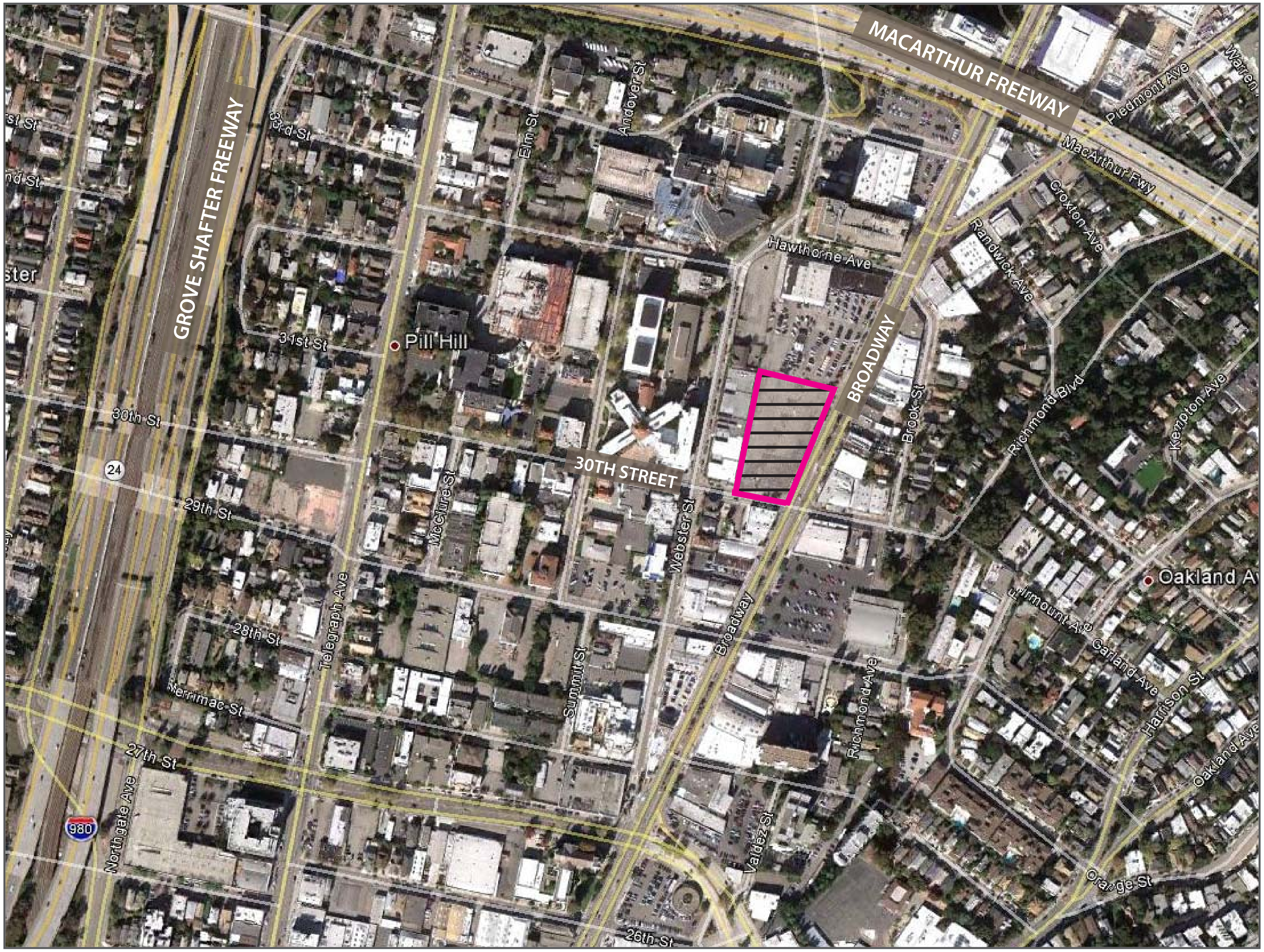
PROJECT DESCRIPTION: The proposed Project involves construction of an approximately 35,750 sq. ft. single-story commercial development consisting of an approximately 26,000 sq. ft. anchor tenant (grocery store) and approximately 9,750 sq. ft. of retail space (which may include up to 6,000 sq. ft. of restaurant space). 171 parking spaces are proposed.

PROBABLE ENVIRONMENTAL EFFECTS: It is anticipated that the proposed Project may have environmental effects related to Air Quality, Cultural Resources, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Noise, and Traffic and Transportation. The Project is expected to generate more than 100 p.m. peak hour net new vehicle trips. It is anticipated that the project will not have environmental effects related to Aesthetics, Agriculture and Forest Resources, Biological Resources, Geology and Soils, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Recreation, and Utilities and Service Systems. However these environmental factors will nevertheless be analyzed in the EIR.

The Draft EIR will also examine a reasonable range of alternatives to the Project, including the CEQA-mandated No Project Alternative, and other potential alternatives that may be capable of reducing or avoiding potential environmental effects.

July 27, 2012
File Number: ER120007

Scott Miller
Interim Planning and Zoning Director, Environmental Review Officer



Project Site

Source : Google Earth, 2012

Figure 1
Project Location

RECEIVED

AUG 13 2012

City of Oakland
Planning & Zoning Division

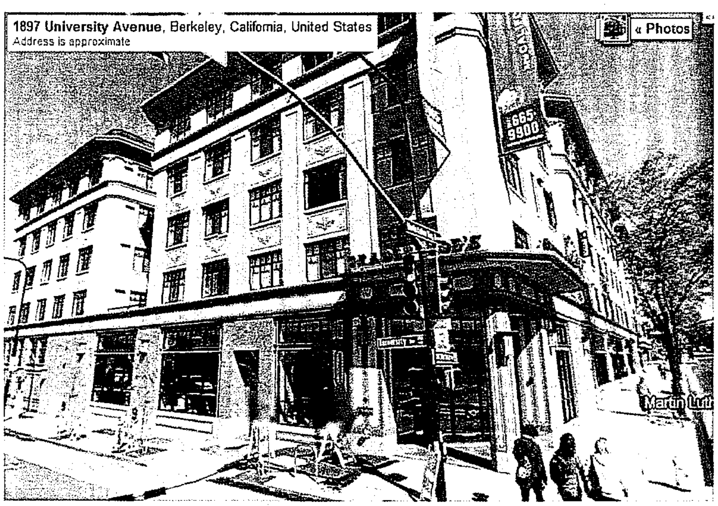
Darin Ranelletti

dranelletti@oaklandnet.com

The project known as "The Shops on Broadway" is inconsistent with the goal of developing the Broadway Valdez Specific Plan as a pedestrian friendly environment. The project as proposed is a squat single story building in the center of one of Oakland's greatest development intensive potential sites. The existing site is a surface parking lot and can easily accommodate development of a higher intensity and reduce the likely need to concentrate development in other areas of the plan which may be historically/architecturally significant.

The development is EXTREMELY auto-centric. This project allocates 171 parking spaces for an anchor tenant of 26k sq feet which means that people will get approximately one parking spot for every 152 square feet of development. Any parking facility weather surface parking or a parking structure requires approximately 400-500 square feet per auto accommodated, in addition to the parking slot this includes the driveways and approaches with defined clearances to access parking spots. An almost 3:1 ratio of the proposed development will go toward AUTOS instead of people.

The residents of this community along Broadway participated in multiple community outreach events which helped us define the types of developments appropriate for this area. This project is a slap in the face to everyone involved from the citizen's advisory to the planners assigned to work on that visioning project all the way to the expensive consultants paid to attend and guide those charretts.



A comparable commercial development which should be encouraged can be seen in Berkeley. It is the Trader Joes development at the corner of University and MLK. This site encourages housing above commercial which is in keeping with the Broadway Valdez specific plan in terms of height /bulk/density and the desired type of construction along Broadway. It also provides residents within the area and above the site easy access to the store within a short walking distance which significantly reduces the need for expensive parking (which associated costs are passed on to customers via more expensive products) . Allowing for a mix of both housing and commercial will foster synergy and a positive feedback loop between the residential and commercial tenants which will reduce the need for net parking.

As a resident who lives two blocks from this proposed development site, I would LOVE portfolio development partners to build something on this site, but too much is at stake here. This is a golden opportunity for the city to encourage the type of development which will make Oakland into a more desirable place to live. This area has great access to transit, it is close to downtown and several residential areas within walking distance such as Harry-Oak/West Lake, Pill hill, Northgate, Mosswood, Hoover Foster, Uptown and even parts of Piedmont and Adams Point.

The decisions made now by the Oakland PC will greatly impact this area for many decades to come. This is not a temporary project, it will become a permanent fixture/ part of or built environment and patrimony to future residents of the area.

Thank you,

Moises Aceves Email: Moyplanner@gmail.com

Ranelletti, Darin

From: bburrowsre@aol.com
Sent: Wednesday, August 15, 2012 10:10 AM
To: Ranelletti, Darin
Subject: Case Number: ER120007 The Shops at Broadway

Darin:

I am the owner of 3020 Broadway (and 250-30th Street) in Oakland, properties built by my grandfather in 1915.

I enthusiastically support the proposed Shops at Broadway, especially in inclusion of the anchor 26,000sf Sprout's Farmers Market. A retail development in this part of Upper Broadway is long overdue and this will be a catalyst for additional new development on the contiguous Hill/Linden property.

Lowney Architecture plans of the buildings are impressive in their design and utilization of the land. Parking access on 30th Street will relieve traffic flow on Broadway, and the roof top parking lot offers easy access and security. The roof plaza is a classic public element.

Regards

Bruce Burrows

The Burrows Company
6 Southpoint Road
Orinda, CA 94563
925-788-5213
bburrowsre@aol.com

EAST BAY
MUNICIPAL UTILITY DISTRICT

August 17, 2012

Darin Ranelletti, Planner III
City of Oakland
Department of Planning, Building, and Neighborhood Preservation
250 Frank H. Ogawa Plaza, Suite 3315
Oakland, CA 94612

Re: Notice of Preparation of a Draft Environmental Impact Report for the Shops at Broadway Development Project, Oakland

Dear Mr. Ranelletti:

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report (EIR) for the Shops at Broadway Development Project located in the City of Oakland (City). EBMUD has the following comments.

WATER SERVICE

EBMUD's Aqueduct Pressure Zone, with a service elevation range between 100 and 200 feet, will serve the proposed development. When the development plans are finalized, the project sponsor should contact EBMUD's New Business Office and request a water service estimate to determine costs and conditions of providing water service to the development. Engineering and installation of water mains and services require substantial lead-time, which should be provided for in the project sponsor's development schedule.

The project sponsor should also be aware that EBMUD will not inspect, install or maintain pipelines or services in contaminated soil or groundwater (if groundwater is present at any time during the year at the depth piping is to be installed) that must be handled as a hazardous waste or that may pose a health and safety risk to construction or maintenance personnel wearing Level D personal protective equipment. Nor will EBMUD install piping in areas where groundwater contaminant concentrations exceed specified limits for discharge to sanitary sewer systems or sewage treatment plants. Applicants for EBMUD services requiring excavation in contaminated areas must submit copies of existing information regarding soil and groundwater quality within or adjacent to the project boundary. In addition, the applicant must provide a legally sufficient, complete and specific written remedial plan establishing the methodology, planning and design of all necessary systems for the removal, treatment, and disposal of all identified contaminated soil and/or groundwater.

375 ELEVENTH STREET . OAKLAND . CA 94607-4240 . TOLL FREE 1-866-40-EBMUD

EBMUD will not design the installation of pipelines or services until such time as soil and groundwater quality data and remediation plans are received and reviewed and will not install pipelines until remediation has been carried out and documentation of the effectiveness of the remediation has been received and reviewed. If no soil or groundwater quality data exists or the information supplied by the applicant is insufficient EBMUD may require the applicant to perform sampling and analysis to characterize the soil being excavated and groundwater that may be encountered during excavation or perform such sampling and analysis itself at the applicant's expense.

WASTEWATER SERVICE

EBMUD's Main Wastewater Treatment Plant (MWWTP) and interceptor system are anticipated to have adequate dry weather capacity to treat the proposed wastewater flows from this project, provided that the project and the wastewater generated by the project meet the requirements of the current EBMUD Wastewater Control Ordinance. However, wet weather flows are a concern. EBMUD has historically operated three Wet Weather Facilities to provide treatment for high wet weather flows that exceed the treatment capacity of the MWWTP. On January 14, 2009, due to Environmental Protection Agency's (EPA) and the State Water Resources Control Board's (SWRCB) re-interpretation of applicable law, the Regional Water Quality Control Board (RWQCB) issued an order prohibiting further discharges from EBMUD's Wet Weather Facilities. Additionally, on July 22, 2009 a Stipulated Order for Preliminary Relief issued by EPA, the SWRCB, and RWQCB became effective. This order requires EBMUD to begin work that will identify problem infiltration/inflow areas, begin to reduce infiltration/inflow through private sewer lateral improvements, and lay the groundwork for future efforts to eliminate discharges from the Wet Weather Facilities.

Currently, there is insufficient information to forecast how these changes will impact allowable wet weather flows in the individual collection system subbasins contributing to the EBMUD wastewater system, including the subbasin in which the proposed project is located. As required by the Stipulated Order, EBMUD is conducting extensive flow monitoring and hydraulic modeling to determine the level of flow reductions that will be needed in order to comply with the new zero-discharge requirement at the Wet Weather Facilities. It is reasonable to assume that a new regional wet weather flow allocation process may occur in the East Bay, but the schedule for implementation of any new flow allocations has not yet been determined. In the meantime, it would be prudent for the lead agency to require the project applicant to incorporate the following measures into the proposed project: (1) replace or rehabilitate any existing sanitary sewer collection systems, including sewer lateral lines, to reduce infiltration/inflow and (2) ensure any new wastewater collection systems, including sewer lateral lines, for the project are constructed to prevent infiltration/inflow to the maximum extent feasible. Please include such provisions in the environmental documentation and other appropriate approvals for this project.

WATER CONSERVATION

The proposed project presents an opportunity to incorporate water conservation measures. EBMUD would request that the City include in its conditions of approval a requirement that the project sponsor comply with the Landscape Water Conservation Section, Article 10 of Chapter 7 of the Oakland Municipal Code. The project sponsor should be aware that Section 31 of EBMUD's Water Service Regulations requires that water service shall not be furnished for new or expanded service unless all the applicable water-efficiency measures described in the regulation are installed at the project sponsor's expense.

If you have any questions concerning this response, please contact David J. Rehnstrom, Senior Civil Engineer, Water Service Planning, at (510) 287-1365.

Sincerely,

William R. Kirkpatrick
Manager of Water Distribution Planning

WRK:ELE:sb
sb12_169.doc

cc: Portfolio Development Partners LLC
1840 San Miguel Drive, Suite 206
Walnut Creek, CA 94596

ALAMEDA
County Transportation Commission
1333 Broadway, Suites 220 & 300 ▪ Oakland, CA 94612 ▪ PH: (510) 208-7400
www.AlamedaCTC.org

August 17, 2012

Darin Ranelletti
Planner III
City of Oakland
Department of Planning, Building and Neighborhood Preservation
250 Frank H. Ogawa Plaza, Suite 3315
Oakland, CA 94612
dranelletti@oaklandnet.com

SUBJECT: Comments on the Notice of Preparation of a Draft Environmental Impact Report (DEIR) for the Shops at Broadway Development Project in the City of Oakland (Case Number ER 10007)

Dear Mr. Ranelletti:

Thank you for the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report (DEIR) being prepared by the City of Oakland. The project site is located at 3001-3039 Broadway in the proposed Broadway Valdez District Specific Plan area and is bounded by Broadway to the east, 30th Street to the south, Webster Street to the west and a car dealership to the north. The proposed project would construct approximately 35,750 square feet of single-story commercial development, including a grocery store, retail/restaurant space and 171 parking spaces.

The Alameda County Transportation Commission (Alameda CTC), on behalf of the Alameda County Congestion Management Agency (ACCMA) through the powers delegated to Alameda CTC by the joint powers agreement which created Alameda CTC, respectfully submits the following comments:

- The City of Oakland adopted Resolution No.69475 on November 19, 1992 establishing guidelines for reviewing the impacts of local land use decisions consistent with the Alameda County Congestion Management Program (CMP). If the proposed project is expected to generate at least 100 p.m. peak hour trips over existing conditions, the CMP Land Use Analysis Program requires the City to conduct a traffic analysis of the project using the Countywide Transportation Demand Model for projection years 2020 and 2035 conditions. Please note the following paragraph as it discusses the responsibility for modeling.
    - The CMP was amended on March 26th, 1998 so that local jurisdictions are responsible for conducting the model runs themselves or through a consultant. The Alameda CTC has a Countywide model that is available for this purpose. The City of Oakland and the Alameda CTC signed a Countywide Model Agreement on May 28, 2009. Before the

model can be used for this project, a letter must be submitted to the Alameda CTC requesting use of the model and describing the project. A copy of a sample letter agreement is available upon request.

- The DEIR should address all potential impacts of the project on the MTS roadway and transit systems. These include MTS roadways as shown in the attached map as well as BART and AC Transit. The MTS roads in the city of Oakland in the project study area are: I-980, San Pablo Avenue, Telegraph Avenue, Broadway, Harrison Street, West Grand Avenue and 14th Street. (See 2011 CMP Figure 2). Potential impacts of the project must be addressed for 2020 and 2035 conditions.

    - Please note that the Alameda CTC has *not* adopted any policy for determining a threshold of significance for Level of Service for the Land Use Analysis Program of the CMP. Professional judgment should be applied to determine the significance of project impacts (Please see chapter 6 of 2011 CMP for more information).

    - For the purposes of CMP Land Use Analysis, 2000 Highway Capacity Manual is used.

- The adequacy of any project mitigation measures should be discussed. On February 25, 1993, the Alameda CTC Board adopted three criteria for evaluating the adequacy of DEIR project mitigation measures:

    - Project mitigation measures must be adequate to sustain CMP service standards for roadways and transit;
    - Project mitigation measures must be fully funded to be considered adequate;
    - Project mitigation measures that rely on state or federal funds directed by or influenced by the CMA must be consistent with the project funding priorities established in the Capital Improvement Program (CIP) section of the CMP or the Regional Transportation Plan (RTP).

  The DEIR should include a discussion on the adequacy of proposed mitigation measures relative to these criteria. In particular, the DEIR should detail when proposed roadway or transit route improvements are expected to be completed, how they will be funded, and what would be the effect on LOS if only the funded portions of these projects were assumed to be built prior to project completion.

- Potential impacts of the project on CMP transit levels of service must be analyzed. (See 2011 CMP, Chapter 4). Transit service standards are 15-30 minute headways for bus service and 3.75-15 minute headways for BART during peak hours. The DEIR should address the issue of transit funding as a mitigation measure in the context of the Alameda CTC policies discussed above.

- The DEIR should also consider demand-related strategies that are designed to reduce the need for new roadway facilities over the long term and to make the most efficient use of existing facilities (see 2011 CMP, Chapter 5). The DEIR should consider the use of TDM measures, in conjunction with roadway and transit improvements, as a means of attaining acceptable levels of service. Whenever possible, mechanisms that encourage ridesharing, flextime, transit, bicycling, telecommuting and other means of reducing peak hour traffic trips should be considered. The Site Design Guidelines Checklist may be useful during the review of the development proposal. A copy of the checklist is enclosed.

- The DEIR should consider opportunities to promote countywide bicycle and pedestrian routes identified in the Alameda Countywide Bicycle and Pedestrian Plans, which were approved in October 2006. The approved Countywide Bike Plan is and Pedestrian Plan are available at http://www.actia2022.com/app_pages/view/58

- For projects adjacent to state roadway facilities, the analysis should address noise impacts of the project. If the analysis finds an impact, then mitigation measures (i.e., soundwalls) should be incorporated as part of the conditions of approval of the proposed project. It should not be assumed that federal or state funding is available.

- Local jurisdictions are encouraged to consider a comprehensive Transit Oriented Development (TOD) Program, including environmentally clearing all access improvements necessary to support TOD development as part of the environmental documentation.

Thank you for the opportunity to comment on this Notice of Preparation. Please do not hesitate to contact me at 510.208.7405 if you require additional information.

Sincerely,

Beth Walukas

Beth Walukas
Deputy Director of Planning

Cc: File: CMP – Environmental Review Opinions – Responses - 2012

Design Strategies Checklist
for the
Transportation Demand Management Element
of the
Alameda County CMP

The Transportation Demand Management (TDM) Element included in Alameda County Congestion Management Program requires each jurisdiction to comply with the Required Program. This requirement can be satisfied in three ways:

1) Adopting "Design Strategies for encouraging alternatives to using auto through local development review" prepared by ABAG and the Bay Area Quality Management District;
2) Adoption of new design guidelines that meet the individual needs of the local jurisdictions and the intent of the goals of the TDM Element or
3) Providing evidence that existing local policies and programs meet the intent of the goals of the TDM Element.

For those jurisdictions that have chosen to satisfy this requirement by Option 2 or 3 above, the following checklist has been prepared.. In order to insure consistency and equity throughout the County, this checklist identifies the components of a design strategy that should be included in a local program to meet the minimum CMP conformity requirements. The required components are highlighted in bold type and are shown at the beginning of each section. A jurisdiction must answer YES to each of the required components to be considered consistent with the CMP. Each jurisdiction will be asked to annually certify that it is complying with the TDM Element. Local jurisdictions will not be asked to submit the back-up information to the CMA justifying its response; however it should be available at the request of the public or neighboring jurisdictions.

Questions regarding optional program components are also included. You are encouraged but not required to answer these questions.

CHECKLIST

Bicycle Facilities

Goal: To develop and implement design strategies that foster the development of a countywide bicycle program that incorporates a wide range of bicycle facilities to reduce vehicle trips and promote bicycle use for commuting, shopping and school activities. (Note: examples of facilities are bike paths, lanes or racks.)

Note: Bold type face indicates those components that must be included the "Required Program" in order to be found in compliance with the Congestion Management Program.

Local Responsibilities:

1a. In order to achieve the above goal, does your jurisdiction have design strategies or adopted policies that include the following:

1a.1 Provides a system of bicycle facilities that connect residential and/or non-residential development to other major activity centers?

Yes O No O

1a.2 Bicycle facilities that provide access to transit?

Yes O No O

1a.3 That provide for construction of bicycle facilities needed to fill gaps, (i.e., gap closure), not provided through the development review process?

Yes O No O

1a.4 That consider bicycle safety such as safe crossing of busy arterials or along bike trails?

Yes O No O

1a.5 That provide for bicycle storage and bicycle parking for (A) multi-family residential and/or (B) non-residential developments?

Yes O No O

1b. How does your jurisdiction implement these strategies? Please identify.

Zoning ordinance: ______________________________
Design Review: ______________________________
Standard Conditions of Approval: ______________________________
Capital Improvement Program: ______________________________
Specific Plan: ______________________________
Other: ______________________________

Pedestrian Facilities

Goal: To develop and implement design strategies that reduce vehicle trips and foster walking for commuting, shopping and school activities.

Local Responsibilities

Note: Bold type face indicates those components that must be included the "Required Program" in order to be found in compliance with the Congestion Management Program.

2a. In order to achieve the above goal, does your jurisdiction have design strategies or adopted policies that incorporate the following:

2a.1 Provide reasonably direct, convenient, accessible and safe pedestrian connections to major activity centers, transit stops or hubs parks/open space and other pedestrian facilities?

Yes O No O

2a.2 Provide for construction of pedestrian paths needed to fill gaps, (i.e., gap closure), not provided through the development process?

Yes O No O

2a.3 Include safety elements such as convenient crossing at arterials?

Yes O No O

2a.4 Provide for amenities such as lighting, street trees, trash receptacles that promote walking?

Yes O No O

2a.5 That encourage uses on the first floor that are pedestrian oriented, entrances that are conveniently accessible from the sidewalk or transit stops or other strategies that promote pedestrian activities in commercial areas?

Yes O No O

2b. How does your jurisdiction implement these strategies? Please identify.

Zoning ordinance: ________________________________

Design Review: ________________________________

Standard Conditions of Approval: ________________________________

Capital Improvement Program: ________________________________

Specific Plan: ________________________________

Other: ________________________________

Transit

Goal: To develop and implement design strategies in cooperation with the appropriate transit agencies that reduce vehicle trips and foster the use of transit for commuting, shopping and school activities.

Local Responsibilities

Note: Bold type face indicates those components that must be included the "Required Program" in order to be found in compliance with the Congestion Management Program.

3a. In order to achieve the above goal, does your jurisdiction have design strategies or adopted policies that include the following:

3a.1 Provide for the location of transit stops that minimize access time, facilitate intermodal transfers, and promote reasonably direct, accessible, convenient and safe connections to residential uses and major activity centers?

Yes O No O

3a.2 Provide for transit stops that have shelters or benches, trash receptacles, street trees or other street furniture that promote transit use?

Yes O No O

3a.3 Include a process for including transit operators in development review?

Yes O No O

3a.4 Provide for directional signage for transit stations and/or stops?

Yes O No O

3a.5 Include specifications for pavement width, bus pads or pavement structure, length of bus stops, and turning radii that accommodates bus transit?

Yes O No O

3.b How does your jurisdiction implement these strategies? Please identify.

Zoning ordinance: ____________________
Design Review: ____________________
Standard Conditions of Approval: ____________________
Capital Improvement Program: ____________________
Specific Plan: ____________________
Other: ____________________

Carpools and Vanpools

Goal: To develop and implement design strategies that reduce the overall number of vehicle trips and foster carpool and vanpool use.

Local Responsibilities:

Note: Bold type face indicates those components that must be included the "Required Program" in order to be found in compliance with the Congestion Management Program.

4a. In order to achieve the above goal, does your jurisdiction have design strategies or adopted policies that include the following:

4a.1 For publicly owned parking garages or lots, are there preferential parking spaces and/or charges for carpools or vanpools?

Yes O No O

4a.2 That provide for convenient or preferential parking for carpools and vanpools in non-residential developments?

Yes O No O

4.b How does your jurisdiction implement these strategies? Please identify.

Zoning ordinance: ______________________
Design Review: ______________________
Standard Conditions of Approval: ______________________
Capital Improvement Program: ______________________
Specific Plan: ______________________
Other: ______________________

Park and Ride

Goal: To develop design strategies that reduce the overall number of vehicle trips and provide park and ride lots at strategic locations.

Local Responsibilities:
5a. In order to achieve the above goal, does your jurisdiction have design strategies or adopted policies that include the following:

5a.1 Promote park and ride lots that are located near freeways or major transit hubs?

Yes O No O

5a.2 A process that provides input to Caltrans to insure HOV by-pass at metered freeway ramps?

Yes O No O

5b. How does your jurisdiction implement these strategies? Please identify.

Zoning ordinance: ______________________
Design Review: ______________________
Standard Conditions of Approval: ______________________
Capital Improvement Program: ______________________
Specific Plan: ______________________
Other: ______________________

Note: Bold type face indicates those components that must be included the "Required Program" in order to be found in compliance with the Congestion Management Program.

C H A R O N N A T   D E S I G N

FROM:	**Leal Charonnat, Architect**	**August 28, 2012**
TO:	Darin Ranelletti, Planner III City of Oakland Department of Planning, Building, and Neighborhood Preservation 250 Frank H. Ogawa Plaza Ste 3315 Oakland, CA 94612	
PROJECT:	"The Shops at Broadway" sponsored by Portfolio Development Partners LLC	
CASE NUMBER:	ER120007	
SUBJECT:	**DRAFT EIR SCOPING REQUEST OF ITEMS TO BE STUDIED**	

"Just when I thought I was out... they pull me back in." – Michael Corleone, The Godfather: Part III

HISTORICAL OAKLAND ERRONEOUS DEVELOPMENT – The City of Oakland, pretty much since it tried to recover from the 1930's depression after World War II to the present day, has ignored the fact it is a city, and instead, has allowed suburban design principles for most major projects. This wholly erroneous approach to building a city has had disastrous affects on Oakland city life. While at the time each project is put forth to helping 'develop' Oakland, rather each time Oakland takes two steps back for any one step forward.

CURRENT AND FUTURE PROPERTY ZONING – The recent preparation of the **Broadway/Valdez District Specific Plan** (BVDSP) is attempting to change the approach and definition of this area, including raising the density of both commercially and residential uses. Under the current zoning (CC-2/D-BR) the possible commercial space FAR is 2.0 or and expected build out of 186,000 square feet; and or up to 150 regular residential units could be built. Future density may even be more along the Broadway Corridor, given its central location to both the downtown and local neighborhoods.

INADEQUATE PROPOSED PROJECT – The current proposed project for Broadway ignores the fact of time and place and is an inappropriate development for this location on Broadway in Oakland. _This project is a simply your typical suburban shopping center development – one story commercial surrounded with parking – with the deference to its location on Broadway that it has some parking on its roof. The lack of density will adversely affect adjacent properties development potential given that a more highly developed property (greater commercial space and or residential units) will provide neighboring uses more needed amenities.

INADEQUATE COMMERCIAL DENSITY PROPOSED - The proposed project of 35,750 square feet is only 20% usage. This is completely unacceptable and such under-utilization must be addressed in the EIR.

INADEQUATE RESIDENTIAL DENSITY PROPOSED – The project proposes no residential use. Given its central location, and need for urban living density, this is unacceptable. The lack of on site residential units must be addressed as opposed to the project proponents analysis that the intended served communities are expected to drive to this property.

IMPROPER TRANSPORTATION ANALYSIS – The project sponsor shows in their documents automobile traffic flow from distant surrounding neighborhoods already served by similar tenants, and ignores local transportation modes and locally served residents.

FUTURE USES – A quick look around Oakland and one can see the "bones" of past low density suburban development – the large store footprint surrounded by open parking. The location of this property is too central and important to be developed on the basis of some 1960's model of commercial development in Manteca.

EIR FINDINGS TO ADDRESS: Give the fore mentioned, the Draft EIR must address:

- Given the proposed under-utilized commercial density and lack of residential use; how such under utilization will impact other adjacent uses, creating a less dense commercial neighborhood;
- How lack of providing an essential amount of development (commercial building area and or residential use/units) such that other local properties, uses, transportation will be negatively affected;
- provide analysis of what how such a low density project will adversely affect the installation of [future] higher density transportation modes [trolley, subway, etc.] that require higher densities;
- how such low density projects will adversely affect ability for adjacent property and neighborhood from enjoying a higher density;
- Address affects such low density design will have an impact on Global Warming
- Provide a minimum of two alternative designs of MAXIMUM densities – in either or both commercial and residential densities and the impact on adjacent existing and (proposed or likely-to-be-proposed) local transportation systems (ie, trolley, subway, etc.)

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CHARONNATDESIGN@GMAIL.COM

Ranelletti, Darin

From: Kirk Peterson [kirk@kpaarch.com]
Sent: Wednesday, August 29, 2012 3:00 PM
To: Ranelletti, Darin
Cc: OHA Alliance
Subject: Broadway Sprouts. ER120007

Darin.

Development of a parking lot sounds good.

I look forward to seeing response to/discussion of the following comments:

- Study relief in main elevation, deep window recesses, aprons, cornices, projections, etc.

- Study proposed design as to context of continuous blocks of street wall: i.e traditional commercial buildings built to the property.

- Comment on big 'dent in proposed design that 'breaks' the street wall.

- Look at design alternate that has a continuous frontage on Broadway. Facade may be 'punctured' with openings/arcades to provide patio/vestibule area.

- Look at use of materials of quality found on Broadway: tile, concrete, stone, brick, terra cotta, divided light clerestory sash, sculptural ornament (figurative - abstract, moldings, brackets, panels pilasters).

- Retail spaces should be at street level, to allow for pedestrian window shopping, and to conform to existing development. This may not be a food store forever.

- Study solar panels over parking. To provide shading/ generate power, as part of sustainable building program. CIty's green ordinance comes into play here.

- The City's ordinances allow for creativity in signage, study cost and feasibility of appropriate signage (the Paramount Grand Lake and Fox signs are spectacular example. The Hill Castle Apts. and PG&E (unfortunately demolished) signs are simple.

- The nearby Whole Foods store features an historic structure, a well detailed new modernist entry foyer, and a suburban style stucco side wall on Harrison Street. The latter look cheap and inappropriate. Look into how having a lot of plan flat stucco (with it's little control joints) is going to be appropriate wall treatment in relation to the wide variety of high quality wall treatments in the Broadway commercial neighborhood.

- How will the presence of a retail food store effect the use and potential growth of auto related business in district.

Please call me if you have questions or would like some clarifications.

Thanks,

Kirk

Kirk E. Peterson & Assoc. Architects
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Oakland CA, 94618
ph: 510-547-0275 x 304
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111 GRAND AVENUE
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TTY 711

Flex your power!
Be energy efficient!

August 30, 2012

ALA980034
ALA-980-1.32
SCH#2012072062

Mr. Darin Ranelletti
City of Oakland
Community and Economic Development Agency
Planning Division
250 Frank H. Ogawa Plaza, Suite 3315
Oakland, CA 94612

Dear Mr. Ranelletti:

The Shops at Broadway – Notice of Preparation

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for The Shops at Broadway project. The following comments are based on the Notice of Preparation.

Traffic Impact Study

Caltrans is primarily concerned with impacts to the State Highway System. Please ensure that the environmental analysis evaluates the traffic impacts on State faculties by applying the following criteria to determine if a Traffic Impact Study is warranted:

1. The project will generate over 100 peak hour trips assigned to a State highway facility.

2. The project will generate between 50 to 100 peak hour trips assigned to a State highway facility, and the affected highway facilities are experiencing noticeable delay; approaching unstable traffic flow (level of service (LOS) "C" or "D") conditions.

3. The project will generate between 1 to 49 peak hour trips assigned to a State highway facility, and the affected highway facilities are experiencing significant delay; unstable or forced traffic flow (LOS "E" or "F") conditions.

We recommend using Caltrans' *Guide for the Preparation of Traffic Impact Studies* for determining which scenarios and methodologies to use in the analysis. It is available at the following website address:

http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf

Should you have any questions regarding this letter, please call Yatman Kwan, AICP of my staff at (510) 622-1670.

Sincerely,

ERIK ALM, AICP
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

Ranelletti, Darin

From: Moises Aceves [moyplanner@gmail.com]
Sent: Friday, August 31, 2012 12:26 PM
To: Ranelletti, Darin
Cc: Nadel, Nancy; jgatewood@xyzgraphics.com; joyceroy@earthlink.net; gloria@ebho.org
Subject: The Shops on Broadway Stripmall- August 31, 2012EIR Scope comments

August 31, 2012
The Shops On Broadway Scoping EIR comments

The EIR should discuss the economic impact of reducing the revenue generating potential of this site by downzoning it from the proposed maximum development under the Broadway Specific Plan. Meaning in addition to talking about the revenue it will generate in taxes for the city, the EIR should produce a comparison table which details how much tax revenue COULD be generated if this site were to be developed as a mixed use development. *Studies in Florida and North Carolina show that dense urban development pays off for local governments. Big-box retail doesn't.* At a time when local governments are struggling financially, two studies — one in Sarasota County, Florida, the other in Asheville, North Carolina — suggest that one of the best fiscal remedies is dense, mixed-use development.

The studies, by Public Interest Projects, a real estate development firm in downtown Asheville, show that on a per-acre basis, sprawling single-use developments such as strip mall stores such as the one proposed by "the shops on Broadway" do a poor job of providing governments with needed tax revenue. Dense, mixed-use development, usually downtown or adjacent to transit, is financially much more beneficial (http://bettercities.net/article/best-bet-tax-revenue-mixed-use-downtown-development-13144)

The EIR should also discuss how this reduced tax contribution will shift the burden of paying for necessary infrastructure investment onto other projects proposed within the Broadway Specific Plan. This shift could mean that other projects are pushed over the financial precipice thereby reducing the likelihood that they will pencil out and as a consequence result in a vacant non-project development.

The DEIR should attempt to meet several criteria required by the California Environmental Quality Act (CEQA); specifically, the evidence portrays this project as a part of the Broadway Valdez area plan, it should attempt to address the cumulative impacts of the reasonably foreseeable future development as proposed.

CEQA requires an EIR to discuss the cumulative effect on the environment of the subject project in conjunction with other closely related past, present and reasonably foreseeable probable future projects. The purpose of this requirement is obvious: consideration of the effects of a project or projects as if no others existed would encourage the piecemeal approval of several projects that, taken together, could overwhelm the natural environment and disastrously overburden the man-made infrastructure and vital community services. This would effectively defeat CEQA's mandate to review the actual effect of the projects upon the environment.

The requirements of CEQA cannot be avoided by **piecemeal** review that results from dividing a large project into many little ones - each with a minimal potential impact on the environment - which cumulatively may have disastrous consequences. See Rio Vista Farm Bureau Center et al. v. County of Solano et al.,5 Cal.App.4th 351, 370, 7 Cal.Rptr.2d 307 (1992); Bozung v. Local Agency Formation Com., 13 Cal.3d 263, 283-284, 118 Cal.Rptr. 249, 529 P.2d 1017 (1975); City of Antioch v. City Council 187 Cal.App.3d 1325, 1333, 232 Cal.Rptr. 507 (1986). Therefore, reasonably anticipated future projects must be considered in an EIR, and discussed in a cumulative analysis. See Rio Vista Farm Bureau Center et al.,supra 5 Cal.App.4th at 370; Laurel Heights Improvement Assn. v. Regents of University of California,47 Cal.3d 376, 394, 253 Cal.Rptr. 426, 764 P.2d 278 (1988); City of Santee v. County of San Diego,214 Cal.App.3d at 1452, 263 Cal.Rptr. 340.

An EIR must include an analysis of the environmental effects of future expansion or other action if two criteria are met. See Laurel Heights,supra, 47 Cal.3d at 394. First, it is a reasonably foreseeable consequence of the initial project. See id. Second, the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects. See id. Under this standard, the facts of each case will **determine whether and to what extent an EIR must analyze future expansion or other action**. See Rio Vista Farm Bureau Center et al.,supra, 5 Cal.App.4th at 372; Laurel Heights,supra, 47 Cal.3d at 396; see also Sacramento Old City Assn. v. City Council,229 Cal.App.3d at 1024-1025, 280 Cal.Rptr. 478. Therefore, we need to address this two-step process with respect to the facts of this project.

The first step involves whether or not a future project will be the consequence of this project. The DEIR should speak in full detail about project alternatives under the proposed full build alternative of the Broadway Valdez specific plan EIR. Also, the scope of the DEIR refers to the Shops on Broadway with little respect to Alternative Sites: thus, the Shops on Broadway is, at the minimum, a reasonably foreseeable project. Therefore, more than a reasonably foreseeable consequence of this project, this project is an integral part of the future expansion at Broadway.

The second step involves whether or not The shops on Broadway, will significantly effect this project and its environmental consequences. As the proposed parking garage access location is purported to be built along Broadway, the area plan's traffic study will impact the Broadway Specific Plan transportation study - certainly aggravate each other's environmental consequences. The roads to and from the Interstate will be shared by the projects. Thus, significant traffic issues pertain to both projects, not just one or the other. Also, the expansion on Broadway as a whole will increase auto fuel exhaust that is in the direct line of this parking garage. Therefore, the future expansion or action will be significant in that it will likely change the scope or nature of the initial project or its environmental effects.

The courts have been more stringent with respect to the cumulative effect requirement in CEQA on a public agency that prepares and approves the EIR for its own project. Here, the City of Oakland prepares and approves its own project (Broadway Specific Plan). Also, the courts have realized that the later the environmental review process of a future project, the more bureaucratic and financial momentum there is behind a proposed project, providing a strong incentive to ignore environmental concerns that could be dealt with more easily at an early stage of the project. The city of Oakland has fully recognized the strong possibility of a future developments within walking distance of this project. In fact, this is part of the evidence to support the need for the project itself. Because of the cumulative environmental effect of both projects, EIRs should be prepared as early in the planning process as possible to enable environmental considerations to influence project, program, and design. See Laurel Heights,supra, 229 Cal.App.3d at 1025. There are certainly traffic, noise, and air quality issues related to this project that will be exacerbated by the future proposed development.

Similar to this situation was the San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus et al. case. 27 Cal.App.4th 713, 32 Cal.Rptr.2d 704 (1994). This case dealt with existing or potential development projects within a five-mile radius of the proposed project. Id. at 720. The court found the DEIR failed to list and consider the cumulative effect of the other projects as "most clearly evidenced" by the traffic analysis, which failed to consider these proposed projects. Id. at 742. The court found that because the other projects are not adequately discussed, the DEIR was not supported by complete and accurate facts for its analysis. See id. The court found the cumulative discussion inadequate as a matter of law. See id.

The purposes set forth in this development proposal are a sham. The following addresses each of the four objectives laid out for this project:

1. The objective to promote a pleasant pedestrian real vibrant with activity. There is little evidence supports the conclusion that this project will meet this objective.

2. If this development is to meet the future expansion of Broadway, why does this project not fit in within that planned expansion? Is this not just a part of a project that should be completed in a joint EIR? Does not this project at the minimum need to address this expansion in the cumulative impacts?

3. This project is to provide revenue to the City of Oakland for continuation of its capital development program. There are no findings to support a future revenue stream to increase The City's capital. The proposed project will increase the number of parking spaces. There are already hundreds of spaces at this location. The capital costs of this project must be enormous compared with the future revenue stream. The costs include at the minimum the following: removing the two rental car lots (which is lost rental revenue or a cost to purchase the land), the cost of the traffic mitigation measures, and the cost of the structure itself. This is all prior to the generation of revenues from the "additional" parking spaces. In fact, it appears that it would be years before the capital costs from this project were recouped. Maybe not; but, there is no evidence to suggest otherwise.

In addition, DEIR should discuss in detail the impact that this parking garage will have on the air quality in Oakland. Will this project which aims to draw people by car instead of local residents contribute to the regional non-attainment status of the air basin? Id. Relying on RAQS/SIPS to mitigate vehicular emission levels is not a satisfactory remedy. Putting off the issues and passing the buck is not a remedy or a mitigation measure. Eventually, someone has to deal with this problem. This should not be news to the City of Oakland in light of its warning from the Air Resources Board to address air quality and to mitigate the identified air quality impacts.

Moving the pollution down the road does not reduce the problem, or even address the problem. Nobody lives at the airport. People do, on the other hand, live near this proposed project site.

"By far, the greatest project-related air quality concern derives from the mobile source emissions that will result from the hundreds of additional daily trips that will be generated at project completion." This is a huge concern. In addition to the vehicle emissions from the public using this parking garage, the EIR should point out mitigation measures that will be applicable to diesel powered shuttle buses and vans coming to and from the structure.

Under the current CEQA guidelines, cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." 14 Cal Code of Regs §15355. The guidelines further define the cumulative impact from several projects the change in the environment resulting from the incremental impact of the project in question "when added to other closely related past, present, and reasonably foreseeable probable future projects." 14 Cal Code of Regs §15355(b). Finally, decisions in this area have held that an analysis of projects with similar impacts is required, even in the event that those projects may not be considered as closely related. See Citizens to Preserve the Ojai v. County of Ventura, 176 Cal.App.3d 421 (1985).

In practice, CEQA guidelines require a brief discussion by the agency that it has considered the cumulative impacts of the proposed projects along with the planned project, even if they found them to not be significant. 14 Cal Code of Regs §15130(a)(2). Therefore, the city of Oakland must consider the cumulative impacts of those projects surrounding the proposed shops on Broadway

Of particular importance are the effects to traffic circulation and air quality. Given the proximity of the proposed Shops on Broadway to the planned Broadway specific plan. On a regular basis, such usage could result in hundreds of additional vehicles that only briefly use the proposed facility and then leave to be replaced by another individual using the facility in a similar manner. As such, this would have a significant impact far above the projection. The overwhelming volume of traffic will impact traffic circulation, noise, and the air quality.

In conclusion, The DEIR will need to fully discuss the aforementioned issues if it is to withstand judicial review. Currently the proposal fails to set forth the cumulative impacts of this project along with the proposed expansion of Broadway Specific Plan

Thank you for your time and considerations of our comments.

Sincerely,

Moises Aceves

Concerned resident living near the proposed shops on Broadway strip mall

formerly New Urban Network
CITIES&TOWNS ONLINE

Best bet for tax revenue: mixed-use downtown development

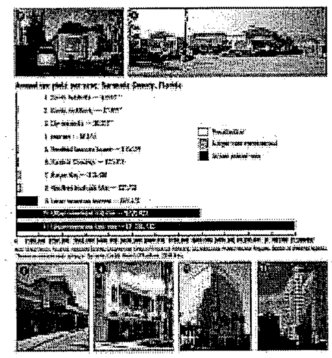
new urban news research development finance infill mixed-use policy

Author: Philip Langdon

New Urban News

Studies in Florida and North Carolina show that dense urban development pays off for local governments. Big-box retail doesn't.

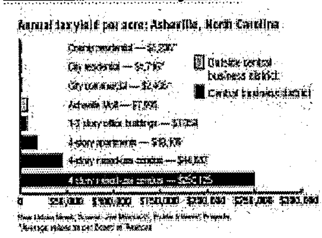
Sarasota County tax yield



At a time when local governments are struggling financially, two studies — one in Sarasota County, Florida, the other in Asheville, North Carolina — suggest that one of the best fiscal remedies is dense, mixed-use development.

The studies, by Public Interest Projects, a real estate development firm in downtown Asheville, show that on a per-acre basis, sprawling single-use developments such as big-box stores do a poor job of providing governments with needed tax revenue. Dense, mixed-use development, usually downtown or adjacent to transit, is financially much more beneficial.

Asheville tax yield



Peter Katz, director of smart growth/urban planning for Sarasota County, commissioned J. Patrick Whalen Jr. and Joseph Minicozzi of Public Interest Projects to analyze how much property tax is produced per acre by various kinds of development. Looking at specific properties — from high-rise buildings in the City of Sarasota's downtown to big-box stores and shopping malls across the county — the researchers discovered that dense, mixed-use urban development is far superior.

From a tax revenue-per-acre (versus per lot or per household) perspective, the properties that are typically occupied by retailers like Walmart, Costco, and Sam's Club turn out to be very disappointing. They generate about $8,350 per acre — "maybe $150 to $200 more per acre per year than single-family houses in the city like mine," Katz says.

The county's premier mall, Westfield Southgate, anchored by Macy's, Dillard's, and Saks Fifth Avenue, was found to produce almost $22,000 per acre — nearly three times as much as a big-box center. "This is not surprising, given that it's a higher-quality building in a better, close-in location (actually within the City of Sarasota)," Katz notes.

Yet even a top-of-the-line mall pales in comparison to the per-acre revenue obtainable from dense urban development. A 17 -story mixed-use building occupying .75 acres on Main Street downtown generates $1.01 million annually in city and county taxes, according to Katz. That building, completed in May 2007, which has retail in its base, several floors of offices, and then condominiums in the upper levels, produces $1.2 million per acre in county property taxes alone. "It would take about 145 acres of Walmarts — or five of them, to be precise — to equal the contribution of that one downtown building," says Katz.

"Even a mid-rise mixed-use building — about seven to nine Stories — in the downtown brings in a healthy amount per year, from the mid-$500,000s to just under $800,000," he says. "Low-rise construction — just two or three stories, with housing or offices over retail — the kind of 'town center' redevelopment now replacing many older suburban shopping areas, can bring in around $70-90,000 per acre. The high end of that range is more than four times that of the county's highest earning mall," Katz emphasizes.

Similar patterns were found in Asheville and Buncombe County, North Carolina. Per acre, the best generator of county property taxes in the Asheville area was urban residential buildings of six stories or more, says Minicozzi. Ranking below those as tax generators were mixed-use condos of 3 to 4 stories and urban mixed-use buildings of 2 to 4 stories.

Always higher return

"Downtowns achieve a higher rate of return than an acre of suburban development could ever do," Minicozzi says. The reason is simple: "Once you start getting two stories, you start getting twice as much value." As buildings go higher while covering much or all of their ground, the revenue escalates.

Minicozzi argues that a municipality should look at tax revenue per acre just as a farmer looks at income per acre: "Urban development produces a valuable yield, like that of a cash crop, while low-density suburban development is the equivalent of growing an acre of grass. By our estimates, suburban development doesn't even cover the cost of the infrastructure that serves it in a reasonable period of time."

When land and buildings are included, the suburban Asheville Mall produces taxes of $7,995 per acre for the county. That's slightly more than the yield from one- and two-story buildings in the central business district. But keep in mind that many downtown buildings surpass the mall in tax contributions. Two- to four-story apartment buildings downtown generate more than twice as much as the mall: $18,109 per acre.

The Asheville area's most productive development, in terms of paying for public services, is mixed-use and in a dense, walkable area. Three- to four-story, downtown mixed-use buildings containing condo units generate $44,887 — more than five times as much per acre as the mall. "A moderate high-rise, mixed-use development that was proposed in the downtown could have generated as much local property taxes as the 73-acre Asheville Mall plus the Asheville Walmart, plus the new 60-acre big-box power center near the airport," Minicozzi says. (The downtown building was approved and is awaiting financing.)

What's best is downtown mixed-use/condo construction that rises six stories or more. It produces more than $250,000 per acre in taxes to the county alone. Minicozzi believes the results are similar in other communities. "We feel that Asheville is a model for the entire country," he says.

Many states distribute a portion of their sales tax to the localities in which it was collected. This has encouraged some localities to pursue big-box and other sprawling retail projects no matter how bad an impact they exert on urban form.

Analysis reveals that the sales tax benefit is often smaller than local officials think. When a dollar of sales tax is collected in Asheville, the state gets a major portion, Minicozzi observes. Some of what's returned is distributed throughout the county. Ultimately only 27 cents reaches Asheville itself.

It's estimated that an average Walmart sells $77 million of merchandise per year. That volume would result in $1.6 million in retail sales tax being returned to Asheville. This amounts to about $47,500 of sales tax revenue per acre, Minicozzi points out. "Couple this with the $3,300 in property taxes per acre for the City, and we're looking at only about $51,000 per acre in total taxes for Asheville."

"When you compare that to the $248,000 per acre that the City gets for property taxes alone for 6-story mixed-use development downtown, the case is clear as to which form of development returns more to our tax base," Minicozzi says.

Furthermore, compact development costs less for roads, water, sewer, and other necessary infrastructure. A 1989 study by the Florida Department of Community Affairs found that the infrastructure cost per "compact" housing unit in downtown was $9,252, versus between $15,316 and $23,960 for more "scattered" suburban style housing units (amounts adjusted to today's dollars).

Minicozzi continues: "When one does the math on those costs against the tax revenues we were seeing in Sarasota County, it took a suburban multifamily housing development 42 years to pay off its infrastructure, while a mixed-use downtown tower (calculated for its residential portions only) was paying off its infrastructure costs in three years."

Lessons learned

Katz concludes: "A simple change of metric — from revenue per lot or unit or household to revenue per acre — makes a huge difference in assessing the fiscal impacts of alternative planning scenarios. What's most surprising to me is that it's taken planners so long to ask such questions and begin looking at the data in this way. Given the lean times we're in, I suspect this will increasingly be part of the conversation in many municipalities."

The findings from the two studies, Katz says, "reinforce a concept advanced in the mid- to late 1800s by Henry George: the idea that land is our most precious shared resource. Since land is the raw material from which government derives most of its working capital in the form of property taxes, it makes sense to evaluate different forms of development in terms of their potential for revenue return."

"For years, I've been trying to make this connection," says Sarasota County Administrator Jim Ley, who runs the county government. "As long as the economy and the tax base continued to grow," many found it easy to ignore the financial downside of sprawl, Ley says. Now, with the economy and tax base in trouble, Ley thinks Katz's study will help lead the county toward a more rational attitude on development.

"A blinding flash of the obvious" — as Ley characterizes the study — can make a difference.

Posted by Robert Steuteville on 13 Sep 2010

Comments

Ranelletti, Darin

From: Julian Prentice [julianyoko@gmail.com]
Sent: Friday, August 31, 2012 2:19 PM
To: Ranelletti, Darin
Subject: Public Comment on ER120007 - The Shops on Broadway

Dear Mr. Ranelletti,

I am writing to add comment to the new development proposed at Broadway & 30th (ER120007). I am a resident/homeowner in the Broadway Valdez District Plan Area. While I am pleased that there has been movement on development, I believe this project is in direct opposition to the Broadway Valdez Specific Plan that the city has drafted, which I strongly support. Speaking to the specific "Vision and Goals" section outlined on page 6 of the plan, this proposed project does not comply with the following:

2. A “Complete” Neighborhood. A “complete” mixed- use neighborhood that is economically and socially sustainable—providing quality jobs, diverse housing opportunities, and an appealing mix of retail, dining and entertainment uses.
Comment: This is a great site for housing. There are few or none with as much potential. The proposed development would undermine the goal of creating a “complete” neighborhood.
3. An Authentic Oakland Place. Adaptive reuse of historic buildings where feasible that maintains a connection to the neighborhood’s history and contributes to a distinctive character and identity.
Comment: The proposed development, a 1 story single use space, looks better suited to one of the nearby historic auto showroom buildings. We have seen this work nearby with Whole Foods.
7. Managed Parking. Carefully managed parking that addresses retail needs while not undermining walking, bicycling and public transit as preferred modes of transportation.
Comment: The large format retail stores should be at the southern end and closer to transit as called for in the district plan. Too much of this project land would be dedicated to parking, which does not seem like a good use of the only open lot in the area.
9. Leveraging Existing Assets. New uses and development that enhance the neighborhood’s social and economic vitality by building upon the area’s existing strengths and successes.
Comment: Again, I want to emphasize the fact that this is a unique parcel in this neighborhood. This plan does not fit the vision that the city has laid out for this area of dense mixed use buildings. It appears this lot was chosen because it would be the easiest to build on. This is one of our best existing assets to be leveraged. We should not give away the lowest hanging fruit for so little return. As the first development in this neighborhood, allowing this project to proceed would undermine the city's and my vision for my neighborhood.

Developing a neighborhood is challenging, especially in a historic city and area with existing structures. Some people seem grateful for any and all development due to a perceived dearth of development interest. The reality is that while housing development is currently depressed, multi-family housing is something of an exception. It is not time to betray the vision of the neighborhood and give up on a dense mixed use future.

Thank you,

Julian Prentice

8/31/2012

Ranelletti, Darin

From: sam postel [sampostel@gmail.com]

Sent: Friday, August 31, 2012 2:27 PM

To: Ranelletti, Darin

Subject: Public Comment on Proposed Development at 30th and Broadway (The Shops at Broadway Project) ER120007

Dear Mr. Ranelletti

As a resident of the district plan area, I feel that the proposed development (ER120007) sells us short. The Broadway Valdez specific plan correctly identifies this site as one of the three major redevelopment opportunities in the north end of the district, and an ideal location for housing on upper levels. Due to it's size, this is one of the few sites that can easily accommodate efficient parking layouts, making it one of the few sites that can easily accommodate a new medium density mixed use building. The site is vital to achieving the specific plans housing goals and creating a complete neighborhood. Oakland needs housing. I want neighbors. This key corridor should be populated. Misusing this site, one of our few prime development opportunities, could cripple the Broadway Corridor for years to come.

Sincerely,

Sam Postel

1600 Franklin Street, Oakland, CA 94612 - Ph. 510/891-4798

August 31, 2012

Darin Ranilletti
Planner III
City of Oakland
Department of Planning, Building and Neighborhood Preservation
250 Frank Ogawa Plaza, Suite 3315
Oakland, Ca. 94612

Subject: Notice of Preparation of a Draft Environmental Impact Report for the Shops at Broadway (3001-3039 Broadway)

Dear Mr. Ranilletti:

AC Transit is writing to express its concerns about the "Shops at Broadway" project at 3001-3039 Broadway. While we are pleased that development is proposed in this long dormant area along one of our most important trunk corridors, we are concerned about the parking and land use impacts of the project.

As you are aware, this segment of Broadway is served by AC Transit trunk line 51A. Line 51A operates every ten minutes during the morning and afternoon peaks and every twelve (12) minutes midday. This frequent service links the community to many key destinations, including Fruitvale BART, City of Alameda, Old Oakland, Downtown Oakland, Uptown, Kaiser and Alta Bates Medical Centers, Macarthur BART, College Street retail, and Rockridge BART. Line 51A also provides the community a convenient link to Line 51B for continued service though Berkeley, including U.C. Berkeley, Downtown Berkeley, University Avenue, 4th Street retail, and the Berkeley Marina.

AC Transit, in cooperation with the Cities of Oakland, Alameda, and Berkeley, recently received a $10.5 million grant from MTC to improve operations of the 51A and 51B. With this in mind, we submit the following concerns about the proposed "Shops at Broadway" project described in the City's Notice of Preparation (NOP).

The Shops at Broadway would consist of a single story 35,750 square foot retail building on an 83,000 square foot lot. Most of the built space—approximately 26,000 square feet—would be occupied by an as yet unnamed grocery store, leaving 9,750 square feet available for retail and restaurant use. The great majority of the lot would be devoted to parking-- 171 surface parking spaces.

The NOP does not illustrate the parking lot design. AC Transit urges that all parking be accessed from streets other than Broadway (either 30th Street or Webster Street). Large numbers of cars accessing the site from Broadway has great potential to slow down and disrupt AC Transit trunk line 51A. This transit line has already been impacted by hundreds of additional parking spaces in the Kaiser Hospital parking structure with a midblock entrance and exit on Broadway. AC Transit would like to work with the City to minimize the impact of parking at this site. The EIR should analyze the potential congestion impact of cars accessing the parking space.

Given the very small scale of the proposed development, the proposed parking ratio is needlessly high--4.8 spaces per 1,000 square feet of retail space. While it is generally acknowledged that grocery stores use larger amounts of parking than other retailers, 4.8 spaces per 1,000 is above even grocery store norms.

Abundant parking encourages visitors and employees to drive to this site, even as the City, MTC, and AC Transit are trying to improve transit options and encourage their use on this corridor. This location is easily accessible from Line 51A on Broadway, Line 1/1R on Telegraph Avenue, and line 57 at Broadway & Macarthur. All three lines provide a convenient link between the site and nearby BART stations.

In addition, thousands of people work and live close to the site—they could access it by walking or biking. The EIR should analyze what steps could be taken to reduce the drive alone mode share among customers and employees accessing the site. Transportation demand management could include an AC Transit's Easypass program, providing steeply discounted bus passes for all employees at the site, and reduced parking supply to encourage transit, biking, and walking over automobile usage.

The site is located with the Broadway Valdez Specific Plan area. Unfortunately, the proposed development does not support the goals of the draft Plan. On p. 8, the draft Plan describes the goal for the North End of the planning area where this project is located as "...creating a high-density mixed use boulevard that caters to adjoining medical complexes and residential neighborhoods with a mix of office, retail, residential, and professional services." The proposed project is not mixed use, and would detract from, rather than add to, a multi-story boulevard type urban design concept. At a minimum, the EIR should include Alternatives which support the plan's boulevard and mixed-use concepts.

Overall, the proposed development is disappointingly small for a site of this importance. The proposed Floor Area Ratio (FAR)—the ratio of built space to land- of the project is just over 0.4. That is a ratio more typical of suburban strip development than of recent development in central Oakland.

The City has expressed great interest in intensifying transit service to the Broadway/Valdez plan area. The City will soon begin a study—the Broadway Transit Alternatives Study-- analyzing alternative approaches to transit improvements in this area and along Broadway. The proposed project does little to support improved transit or increased transit ridership. To the greatest extent possible, the EIR should incorporate the information developed for and the findings of the Transit Study. The EIR should also analyze the degree to which different types of project are likely to provide ridership and support for improved transit.

Thank you for your interest in AC Transit's comments. If you have any questions about this letter, please contact Nathan Landau (nlandau@actransit.org, 891-4792). We look forward to working with the City to support positive development along Broadway

Sincerely,

Dennis Butler
Chief Planning and Development Officer

Cc: Robert del Rosario, Nathan Landau, Stephen Newhouse

EBHO GREENBELT ALLIANCE Open Spaces & Vibrant Places SIERRA CLUB FOUNDED 1892 ULTRA OAKLAND

Darin Ranelletti
Planner III, City of Oakland
Department of Planning, Building and Neighborhood Preservation
250 Frank H. Ogawa Plaza, Suite 3315
Oakland, CA 94612

Cc: Vien Truong, Chair, Oakland Planning Commission

Re: Scope of EIR for 3001-3039 Broadway proposal

Dear Mr. Ranelletti:

Thank you for the opportunity to comment on the scope of the Environmental Impact Report for the 3001-3039 Broadway proposal. East Bay Housing Organizations, ULTRA, Greenbelt Alliance and Sierra Club-Northern Alameda County Group urge that a robust set of alternatives be included in the EIR for this proposed development, which could help to define the pattern of development along the upper Broadway corridor. The undersigned organizations have been actively engaged in the public process for the Broadway Valdez District Specific Plan, and have seen clear support emerge for mixed-use, compact, transit-oriented, and equitable development. <u>We urge that the EIR for the "Shops on Broadway" proposal analyze mixed-use, affordable residential, and transit-rich alternatives that adhere to the Specific Plan concept of a inclusive, sustainable and vibrant area</u>.

This proposal has some positive elements, including neighborhood-serving commercial development; active public space and street frontage; and sustainable building materials. However, we are disappointed to see a one-story, solely commercial development at a site that could be well-suited for dense mixed-use development. <u>We are concerned that this proposal and EIR process are moving forward without real connection to the Broadway Valdez District Specific Plan process</u> (although we note that the Specific Plan will be considered as part of the EIR). While this proposal aligns with current interim zoning, it does not meet the Draft Concept Plan guidelines, which clearly aim to shape the North End of the plan area as a "mixed-use boulevard" characterized by four- to six-story buildings and significant density. This site is also designated in the plan area as a "major development opportunity" site with a "mixed-use designation" and "potential for residential development," including affordable housing development. Given the prominence of this site, and community input expressing the desire for a dense and vibrant Broadway, this is a prime opportunity to set a precedent for equitable development in the plan area.

EBHO members, allies, and local residents are also concerned about the impact of this development on other local-serving grocery stores, especially the Grocery Outlet, and about whether the amount of parking proposed (171 spaces) is excessive, given the vision of the Plan as a walkable, transit-rich corridor.

While we are pleased to see that the scope of the EIR will include a mixed-use alternative, we hope this analysis will robust and fully studied. It should examine the impact of higher-density mixed-use development on the site (i.e. housing units above the commercial space in a 4-6 story building), as intended in the draft concept plan land use designation.

Given the need for housing accessible to the nearby workforce at different income levels, the <u>EIR should also analyze the impact of multi-family affordable residential development</u> on the site, including that of larger, family-sized units (noting that lower-income residents are more likely to be transit-dependent and less likely to drive cars).

The EIR should include an alternative that includes <u>robust and improved transit</u>, including the extension of the B shuttle route and enhanced bus shelters, both requests often made by senior residents of nearby apartment buildings. <u>The EIR should also examine the impact of reduced parking on the site</u>.

Finally, the EIR should include a health impact assessment (HIA) on the proposed single story commercial development, as well as a separate HIA on the "mixed-use" and "neighborhood-serving" development alternatives.

The city has invested considerable resources into the development of the Broadway Valdez District Specific Plan, not only to spur development, but to create a cohesive corridor, meet resident needs and desires, and ensure some predictability for developers and property owners. A full analysis of alternatives for the site, honoring the intent of the District Specific Plan, will better allow the public to assess whether this proposal helps meet those goals. Thank you for your consideration of these comments and do not hesitate to contact us with any questions.

Sincerely,

Gloria Bruce, Deputy Director, East Bay Housing Organizations (EBHO)

John Gatewood, Co-founder, Urbanists for a Livable Temescal Rockridge Area (ULTRA)

Kent Lewandowski, Sierra Club Northern Alameda County Group

Matt Vander Sluis, Senior Field Representative-East Bay, Greenbelt Alliance

Ranelletti, Darin

From: Joyce Roy [joyceroy@earthlink.net]
Sent: Friday, August 31, 2012 4:58 PM
To: Ranelletti, Darin
Subject: Scoping for 'Shops on Broadway'

Darin Ranelletti, Planner III
City of Oakland
Department of Planning, Building and Neighborhood Preservation

Re: Scoping for EIR for 'Shops on Broadway

Dear Mr. Ranelletti,

This one-story retail project with 171 parking spaces is really at odds with the Broadway/Valdez Specific Plan and would start it off on the wrong foot. Much of Broadway already has the characteristics of a strip mall and this one story retail development would add to it.

In the spirit of the Broadway/Valdez Specific Plan, this site calls for a four to six story mixed-use project, and that should be studied as an alternative.

The market for housing is improving, and may even be good by the time this is ready for construction. It could be more profitable than retail alone. If the developer does not have experience with housing, he could team with one who does.

Please, include all scoping comments in the EIR.

Thanks,

Joyce Roy
258 Mather St.
Oakland, CA 94611

APPENDIX B

City of Oakland Major Projects List – May 2013

CITY OF OAKLAND - ACTIVE MAJOR DEVELOPMENT PROJECTS
May 2013

	PROJECT NAME	APPLICANT CONTACT	LOCATION (ADDRESS AND/OR APN)	COUNCIL DISTRICT	DESCRIPTION	CITY CONTACT	STATUS
RESIDENTIAL PROJECTS							
Pre-Application Discussions							
1	**~Merrill Gardens @ South Rockridge**	Chad Lorents Urbal Architecture (206)257-0972	4901-4939 Broadway, 311-313 51st Street, 4964-4974 Desmond Street APN: 013 -1136-008-04, 013 -1136-011-00, 013 -1136-012-00, 013 -1136-010-00, 013 -1136-009-02, 013 -1106-005-05, 013 -1136-004-02, 013 -1136-022-01, 013 -1106-021-	1	▪161 residential care units ▪10,000 S.F. of commercial space ▪93 parking spaces	Mike Rivera 238-6417	Pre-application filed.
2	**~Merrill Gardens @ North Rockridge**	Rob Zirkle Brick, LLP (510)516-0167	5107, 5117, 5175 Broadway APN: 014 -1241-009-00, 014 -1241-008-00, 014 -1241-005-01	1	▪139 residential units ▪11,250 S.F. of commercial space ▪151 parking spaces	Mike Rivera 238-6417	Pre-application filed.
3	**51st & Telegraph, Civiq**	Roy Alper 5110 Telegraph, LLC (510)550-7175	5110 Telegraph Ave APN: 014 -1226-009-02	3	▪ retain previously approved entitlements *Option 2* ▪increase ground floor retail to 19,600 S.F. ▪100 residential units ▪60,000 SF of office	Catherine Payne 238-6168	Pre-application filed.
4	**~1331 Harrison Project***	Yves Ghiai (415)775-2113	1331 Harrison Street APN: 002-0065-006-01	2	▪25-story ▪125 resdiential units	Catherine Payne 238-6168	Pre-application filed. See also project number 43.
5	**377 2nd Street***	Marge Vincent Vanguard Properties (415) 321-7077	377 2nd Street APN: 001 -0143-008-00 001 -0143-007-00 001-0143-010-00	3	▪6 story building ▪98 units ▪2 retail spaces ▪114 parking spaces	Aubrey Rose 238-2071	LPAB 06/12/06. LPAB for design review 10/16/06. Planning Commission approval 12/13/06. Extension granted 1/12/09. Extension granted 12/12. See project number 43.
Application Submitted – Under Review							
6	**Felton Acres**	Robert Felton (510)548-4637	Devon Way APN: 048H-7600-007-00	1	▪Subdivision into 25 units and two new roads	Lynn Warner 238-6983	Application submitted.
7	**~4311-4317 Macarthur Blvd**	Pacific Companies/AMG (818)317-4168	4311- 4317 Macarthur Blvd APN:030 -1982-121-00 030 -1982-122-00	4	▪115 apartment senior housing facility ▪3,446 S.F. retail	Lynn Warner 238-6983	Application filed. NOP published 05/18/11. PC scoping hearing 06/15/11. DEIR published in 10/2012. FEIR preparation underway.
8	**~Uptown Parcel 4 (Telegraph/19th Street)***	Forest City Residential, Inc. Susan Smartt (415) 836-5980	Telegraph/19th Street/New Street/Williams Street	3	▪370 residential units	Catherine Payne, 238-6168	Application filed. Design Review Committee 07/25/07. Temporary Art Garden approved 7/6/12. Art garden completed.

*** 10K PROJECT (project includes residential units located in Downtown)**
~Denotes new project, a recent change to the project description, or status.
Complied by Planning and Zoning, (510) 238-3941.

CITY OF OAKLAND - ACTIVE MAJOR DEVELOPMENT PROJECTS
May 2013

9	**1443 Alice Street***	The Real Estate Transformation Group Mark Borsuk (415)922-4740	1443 Alice Street / 1434 Harrison Street APN: 008 -0626-016-00 008 -0626-023-00	2	▪245 residential units	Darin Ranelletti 238-3663	Design Review Committee 05/23/07. Project inactive.
10	**Emerald Views * (formerly19th Street Residential Condominiums)**	Ian Birchall (415)512-9660	222 19th Street APN: 008-0634-003-00	3	▪370 residential units ▪933 S.F. café	Heather Klein 238-3659	Application filed. NOP published 11/09/07. DEIR preparation underway. LPAB for design review 04/14/08. Design Review Committee 04/23/08. DEIR published 10/05/11. FEIR preparation underway.
11	**~Cities Lines LLC**	Daniel Altman 510-517-6094	10920 MacArthur Blvd APN: 047-5583-008-02	7	▪5-story/50,000 S.F.. office building	Aubrey Rose 238-2071	Application withdrawn.
12	**Fruitvale Point**	Terra Linda Development Carlos Plazola (510)207-7238	880 Fruitvale Ave	5	▪47residential units ▪49 live/work units ▪4,000 S.F. commercial	Catherine Payne, 238-6168	Project inactive.
Application Approved							
13	**Lion Creek Crossing (formerly Coliseum Gardens)**	EBALDC Carlos Castellmos (510) 287-5335	66th Ave. at San Leandro Street APN-Multiple	6	*Phase V* ▪128 rental senior housing units	Catherine Payne 238-6168	Project approved 5/2/12.
14	**9400 International Blvd**	Acts Community Development Colby Northridge (949)660-7272	9400-9500 International Blvd APN: 046 -5423-022-00 046 -5423-001-01 046 -5423-018-002	7	▪ 59 affordable units ▪3,500 s.f. commercial space.	Peterson Vollmann 238-6167	Project approved 2/12/2012.
15	**325 7th Street***	YHLA Yui Hay Lee (510)836-6688	325 7th Street APN:001 -0189-005-00 001 -0189-013-00 001 -0189-014-01	2	▪382 residential units ▪ 9,000 S.F. commercial	Heather Klein 238-3659	Design Review Committee 11/0707. NOP published 12/18/07. DEIR published 10/18/10. LPAB DEIR hearing 11/8/10. PC DEIR hearing 12/1/10. FEIR published 06/30/11. Planning Commission approval and certification of the FEIR 07/20/11.
16	**~116 E 15th Street**	Satellite Housing, Inc. (510)647-0700	116 E 15th Street, 1507 2nd Ave, 1521 2nd Ave APN: 020 -0181-016-00 020 -0181-013-01 020 -0181-005-01	3	▪92 affordable senior units	Aubrey Rose 238-2071	Planning Commission approval 04/27/11. Grading permit issued 4/29/2013.
17	**California Hotel**	EBALDC Natalie Bonnewit (510)287-5353	3501 San Pablo Ave APN: 005 -0479-002-01	3	▪Rehabilitation and conversion of the existing studio and affordable units and ground floor commercial into 137 affordable apartments	Jason Madani 238-4790	Approved 03/14/11. Building Permit #B1102582. Under construction.

*** 10K PROJECT (project includes residential units located in Downtown)**
~Denotes new project, a recent change to the project description, or status.
Complied by Planning and Zoning, (510) 238-3941.

CITY OF OAKLAND - ACTIVE MAJOR DEVELOPMENT PROJECTS
May 2013

18	**~Fruitvale Village Phase II**	Unity Council/Signature Properties Patrick Van Ness (925) 463-1122	Block bounded by 35th and 37th Avenues, East 12th Street and BART tracks APN: 033-2197-019 and 033-2177-02	5	▪Phased multifamily residential development with 275 residential units ▪Parking garage	Darin Ranelletti 238-3663	NOP published 12/22/08. DEIR published 01/12/10. FEIR published 04/2810. Planning Commission approval and certification of the FEIR 05/19/10. Extension granted 3/18/13.
19	**Cathedral Gardens ***	AEH Housing Benny Kwong (415)295-8857	2126 M L King Jr Way 616 21st St. 620 21st St. APN:008 -0659-023-00 008 -0647-016-00 008 -0647-017-00	3	▪100 affordable housing ▪Rehabilitation of the Rectory building	Peterson Vollmann 238-6167	Planning Commission project and Tentative Tract Map approval 07/20/10. Building permits issued (B1104230, B1104231, B1202305) and under construction
20	**1032 39th Street**	Madison Park Financial (510)452-2944	1032 39th Street APN: 012 -0953-027-00	1	▪25 residential units in Oakland ▪75 residential units in Emeryville	Catherine Payne, 238-6168 Miroo Desai Emeryville Senior Planner Senior Planner (510) 596-3785	Oakland Planning Commission 12/3/08. Emeryville City Council approval 01/20/08. Extension granted 11/22/10. Extension granted 08/19/11. Extension granted 10/12/12.
21	**~Creekside Mixed Use Project**	George Hauser Hauser Architects (415)519-5398	5132 Telegraph Ave APN: 014 -1226-013-00	1	▪120 residential units ▪7,700 S.F. of commercial	Darin Ranelletti 238-3663	Application filed. Design Review Committee 03/28/07 and 05/23/07. EIR Scoping Session 01/09/08. NOP published 12/21/07. DEIR published 08/15/08. Planning Commission approval 11/19/08. Extension granted 12/14/12.
22	**~1431 Jefferson Street***	Menlo Capital group LLC (415) 762-8200	1417-1431 Jefferson Street APN: 003 -0071-018-00 003 -0071-017-00	5	▪54 residen♦ial units ▪3,000 S.F. ground floor commercial	Ulla-Britt Jonsson, 238-3322	Approval 07/09/08. NEPA completed. Building Permit #B1101888. Extension granted 01/15/13.
23	**~Wattling Street**	Phil Lesser (650)347-6014	3927 Wattling Street APN: 033-2170-003-00	5	▪18 condominium units ▪61 townhome units	Heather Klein 238-3659	Application filed. Environmental scoping underway. Design Review Committee 10/24/07. Planning Commission approval 06/18/08. Revisions submitted 10/20/10. Revisions approved 1/18/11. Extension granted until 12/31/2013.
24	**St Joseph's**	BRIDGE Housing Corp Smitha Seshadri (415) 989-1111	2647 International Blvd APN: 025 -0701-004-01	5	▪Rehabilitation of the historic building ▪84 units senior housing ▪15,000 S.F. office	Joann Pavlinec 238-6344	Application filed. LPAB 08/13/07 and 09/24/07. Planning Commission certification of the FEIR and project approval 12/19/07. Building permit for Phase I #B0705698. Planning Commission approval of Phase II 08/05/09. Building Permit#B1101899 for phase II and III. Under construction.

*** 10K PROJECT (project includes residential units located in Downtown)**
~Denotes new project, a recent change to the project description, or status.
Complied by Planning and Zoning, (510) 238-3941.

CITY OF OAKLAND - ACTIVE MAJOR DEVELOPMENT PROJECTS
May 2013

25	**2985 Ford Street**	8855 San Leandro St. LLC (510)465-3700	2985 Ford Street APN:025 -0673-007-00	5	▪56 condominium units ▪15 work/live units	Neil Gray 238-3878	Application filed. Planning Commission approval of project and TPM 11/07/07. Extension granted 2/19/10.
26	**~Bakery Lofts**	Madison Park Financial Frank Flores (510)452-2944	945 53rd Street APN: 049 -1173-002-00	1	*Phase III* ▪61 units ▪3161 S.F. of commercial	Lynn Warner 238-6983	Application filed. Design Review Committee 03/28/07. Planning Commission approval 08/01/07. Extension granted. Grading permit #GR0800085. Building permit #B0705781 expired. Building permit #RB1100834 to demolish warehouse issued. Project under construction.
27	**Courthouse Condominiums (formerly 2935 Telegraph Ave.)**	MBH Architects (510) 865-8663	2935 Telegraph Ave.	3	▪142 residential units ▪3,000 S.F. retail	Joann Pavlinec 238-6344	Application filed. NOP and Initial Study published 10/06/06. DEIR published 03/19/07; Design Review Committee 03/28/07 and 05/23/07. Planning Commission certification of the FEIR and project approval 08/01/07. Planning Commission 04/01/09 for revisions to Conditions of Approval. Applicant withdrew request for revisions 04/20/09. Extension granted. Building Permit #B0901385. Extension granted on 10/13/11. Extension granted on 10/25/12. Pre-Application filed for a potential alternate project see project number 61.
28	**~4801 Shattuck Ave**	Steven Tiffin (510)550-4200	4801 Shattuck Ave APN: 013-1162-009-01 013-1162-009-02 013-1162-010-00	1	▪44 units	Peterson Vollmann 238-6167	Design Review Committee 01/24/07. Planning Commission approval 04/04/07. Appeal denied by City Council 07/17/07. Litigation ruling in favor of project. Extension granted 09/11/08. Extension granted 02/04/10. Extension granted 12/2011. Extension granted 12/2012.
29	**~1538 Broadway***	Forum Design Marc DiGiacomo (415)252-7063	1538 Broadway APN: 008-0622-007	3	▪69 residential units ▪Ground floor food sales	Peterson Vollmann 238-6167	Administrative approval 03/07/07. Extension granted 03/03/09.

*** 10K PROJECT (project includes residential units located in Downtown)**
~Denotes new project, a recent change to the project description, or status.
Complied by Planning and Zoning, (510) 238-3941.

CITY OF OAKLAND - ACTIVE MAJOR DEVELOPMENT PROJECTS
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30	**~2116 Brush Street**	AGI Capital Tom Holt (415) 775-7005	2101-2116 Brush Street; 760 22nd Street APN: 003 -0025-010-00 thru 011-00 003-0035-006-00 thru 005-00 003-0023-007-01 thru 011-02	3	*Parcel A* ▪63 residential units *Parcel B* ▪18 residential units *Parcel C* ▪65 residential units	Heather Klein 238-3659	Design Review Committee 10/25/06. Planning Commission approval 02/07/07. Extension granted 07/25/07. Extension granted 01/20/10. Extension granted 08/11. Extension granted 12/08/12.
31	**~459 23rd Street**	Toby Levy (415)777-0561	459 23rd Street APN: 008 -0658-004-01 008 -0658-002-01	3	▪70 residential units ▪Ground floor retail	Peterson Vollmann 238-6167	Approved 12/28/06. Revision to increase the number of units to 70 approved 08/14/07. Grading permit expired. Extension granted 12/18/08.
32	**~1614 Campbell Street**	Madison Park Frank Flores (510)452-2944	1614 Campbell Street APN:007 -0560-001-02	3	▪92 live/work conversion	Peterson Vollmann 238-6167	Planning Commission approval 12/13/06. Revised to include only live/work units. Revision approved 07/29/08. Building permit in B1201003 issued.
33	**3250 Hollis**	Bill Lightner (415)267-2900	3250 Hollis Entire Block of 007-0593	3	▪46 live/work units ▪74 residential units	Peterson Vollmann 238-6167	Design Review Committee 08/23/06. Planning Commission approval 10/18/06. Extension granted 12/21/06. Extension granted until 08/13/09.
34	**~Hollis 34**	Dogtown Development (510)428-1714	3241 Hollis Entire Block of 007-0619	3	▪124 live/work units	Peterson Vollmann 238-6167	Application filed. Design Review Committee 08/23/06. Planning Commission approval 10/18/06. TPM approval 10/18/06. Extension granted 01/16/09. Extension granted on 11/17/2011. Extension granted 12/2012.
35	**721-741 Broadway ***	Carona Engineering Debo Sodipo (510)444-8311	721-741 Broadway APN: 001-0201-015-00	3	▪48 residential units ▪5 live/work units ▪2,300 S.F. retail	Joann Pavlinec 238-6344	LPAB 06/12/06. Planning Commission approval 8/16/06. Planning Commission approval for administrative design review 10/04/06. TPM approval 05/24/07. Extension granted 08/16/09.
36	**~460 Grand Ave**	Bridge Housing Joseph McCarthy (415)989-1111	460 Grand Ave APN: 010-0779-012-00 010-0779-014-01 010-0779-015-01	3	▪ 74 residential units	Darin Ranelletti, 238-3663	Design Review Committee 02/22/06. Planning Commission approval 06/07/06. Appeal denied by City Council 07/18/06. Extension granted 05/20/09. Extension granted 09/07/11. Extension granted 07/20/12.

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37	**~2538 Telegraph Ave***	Rina Davis 2538 Telegraph LLC (510)390-4408	2538 Telegraph Ave 437 26th St APN: 009 -0683-021-01 009 -0683-024-00	3	▪ 97 residential units ▪ 9,000 S.F. of commercial space	Catherine Payne, 238-6168	Design Review Committee 11/16/05.; Planning Commission approval 01/04/06. Extension granted 12/10/08. TPM granted 02/19/09. Extension granted 08/08/11. Extension granted 10/01/2012.
38	**~51st & Telegraph, Civiq**	Roy Alper 5110 Telegraph, LLC (510)550-7175	Area bounded by Telegraph, 51st and Clark Streets APN: - Multiple	3	▪ 68 residential units ▪Less than 3,000 S.F. of commercial space ▪4 buildings built over, ▪Subterranean Parking	Darin Ranelletti 238-3663	Design Review Committee 11/16/05. Planning Commission approval 1/18/06. Appealed to City Council. Appeal withdrawn at City Council 03/21/06. Extension granted 09/08/08. Extension granted 02/14/11. Extension granted 01/14/13. Major Revisions filed see pre-application for 5110 Telegraph Ave, project number 1.
39	**~Valdez & 23rd Street Project***	The Enterprise Group Walter Cohen (415) 221-2534	Valdez St./Webster/23rd St./24th Streets APN: 008-0668-004-00 008-0668-009-07 008-0668-005-00	3	▪281 residential units ▪500 car parking structure including 250 public spaces ▪12,000 S.F. retail	Heather Klein 238-3659	Design Review Committee 10/26/05; Planning Commission approval 12/07/05. TPM approval 02/28/06. Extension granted 09/19/07. Extension granted 01/21/09. Extension granted 11/2011. Extension granted 12/12.
40	**Emerald Parc**	Tom Dolan (510) 839-7200	2400 Filbert Street APN: 005-0433-018-04	3	▪55 townhomes	Peterson Vollmann 238-6167	Planning Commission approval. 11/16/05. Appeal denied by City Council 02/21/06. Extension granted 02/14/08, 02/19/09, and 11/2011.
41	**Red Star**	National Affordable Communities David Booker (949) 222-9119	1396 5th Street APN: 004-0069-004-00	3	▪119 affordable senior units ▪3,300 S.F. commercial space	Darin Ranelletti 238-3663	Design Review Committee 04/27/05. Planning Commission approval 06/17/05. Revised project submitted 04/16/08. Design Review Committee 05/28/08. Extension granted 06/06/08 and 06/15/09. Building Permit # B1004649. Project under construction.
42	**~2501 Chestnut Street**	Bridge Housing Kristy Wang (415) 989-1111	2501 Chestnut Street APN: 005-0436-002-00	3	▪50 live/work units	Heather Klein 238-3659	Design Review Committee 08/11/04. Planning Commission approval 10/06/04. Vesting TPM submitted 08/21/06. Extensions granted 09/29/06, 11/13/07, 10/15/08, and 10/15/10. Site cleanup occurring. Extension granted 09/29/11. Extension granted 01/08/13.

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43	**Jackson Center Two***	EBOP Associates, LLC	11th, 12th, and Alice Streets APN: 002-0075-002-00	2	▪110 condominium units ▪5,000 S.F. retail	Heather Klein 238-3659	Design Review Committee 07/23/03; Planning Commission approval 09/03/03. Application filed for revisions to project. Design Review Committee 07/27/05; Administrative approval 09/16/05. TPM approval 02/14/06. Building permit #B0504575 expired. Extension granted 08/20/09.
44	**~377 2nd Street***	Marge Vincent Vanguard Properties (415) 321-7077	377 2nd Street APN: 001 -0143-008-00 001 -0143-007-00 001-0143-010-00	3	▪96 units	Heather Klein 238-3659	LPAB 06/12/06. LPAB for design review 10/16/06. Planning Commission approval 12/13/06. Extension granted 1/12/09. Extension granted 12/13/12. See project number 3 for revisions to approved plans.
45	**~1331 Harrison Project***	Toby Levy (415)777-0561	14th and Harrison Street APN: 002-0065-006-01	2	▪98 condominium units ▪9,000 S.F. commercial ▪Structured parking	Heather Klein 238-3659	Planning Commission approval 12/3/03. Design Review Committee approval for revisions 03/23/05. Project revisions approved administratively 04/25/05. Foundation permit #B0504335 expired. Extension granted 04/20/09. An application to re-establish a previous parking lot on the site filed 09/16/09 (Case File Number CU09-197). City Council approval of parking lot 07/20/10. Tentative Parcel Map approval 06/16/11. Extension granted 12/2011. Pre-application filed 01/2013, see project number 2.
46	**~3884 Martin Luther King Jr. Way**	Neil Cotter (650) 259-9303	3884 Martin Luther King Jr. Way APN: 012-0968-031-00	1	▪40 residential units	Darin Ranelletti 238-3663	Planning Commission approval 9/20/06. Extension granted 6/18/09. Extension granted 11/07/12.
47	**~188 11th Street ***	Lakeshore Partners Tom Peterson (510) 444-7191	176 11th Street, 198 11th Street, 1110 Jackson APN: 002 -0081-008-00 002-0081-007-00 002-0081-002-00	2	n99 affordable apartment units n18,000 S.F. health clinic and ground floor commercial	Peterson Vollmann 238-6167	Approved administratively 11/24/10. Extension granted 01/14/13.
48	**2847 Peralta Street**	William Lightner (415)267-2900	2847 Peralta Street APN: 007 -0589-018-02 007 -0589-023-00	3	▪76 dwelling units and 24 live work units	Peterson Vollmann 238-6167	Planning Commission approval 01/18/06. Grading permit #GR0600068. Extension granted 05/05/08. Extension granted 09/22/09. Extension granted 11/2011.

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49	**~Siena Hills**	Hillside Homes Edward Patmont (925) 946-0583	Between Rilea Way and Greenridge Drive on Keller Ave. APN: 04A-3457-033-01	6	▪22 single-family homes	Heather Klein 238-3659	DEIR published 01/05/05; FEIR published 2/18/05; Planning Commission certification of the FEIR and approval of the project 03/02/05; TTM approval 06/1/05. Grading permit #GR0500061. Building permits # RB0501810-13 and 15-18. City Council GHAD approval 12/05/06. Project under construction. Extension granted 06/18/08. Extension granted 02/10. Extension granted 08/12. Extension granted 01/13.
50	**Monte Vista Villas (formerly Leona Quarry)**	The DeSilva Group David Chapman (925) 828-7999	7100 Mountain Boulevard APN: 037A-3151-001-01	6	▪477 residential units	Bill Quesada, Building Services, 238-6345	City Council approval 12/03/02; City Council re-approval 02/17/04; Grading permit #GR0400025. Project under construction.

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MIXED-USE PROJECTS							
Pre-Application Discussions							
Application Submitted - Under Review							
51	**~Oak Knoll Redevelopment Project**	SunCal Oak Knoll LLC Pat Kelliher (510)251-0711	167 acre site 8750 Mountain Blvd. APN: Multiple	7	▪960 residential units (408 SFD, 248 townhomes, 304 condominiums) ▪82,000 S.F. commercial	Scott Miller 238-2235	Request for General Plan conformity 05/06. Director's determination of General Plan conformity 05/16/06. Request for amended General Plan conformity 12/06. Director's determination of amended General Plan conformity 12/20/06. NOP and Initial Study to prepare a Supplemental EIR issued 02/08/07. Environmental Scoping Session 02/28/07. Planning Commission denied the Appeal and upheld the General Plan determination 03/07/07. SEIR was published 09/06/07. Public hearing for the Draft SEIR 10/10/07. Design Review Committee 09/26/07. SunCal requests no further work fall of 08. Discussions with staff and developer about restarting entitlement and CEQA process - 2013.
52	**Mandela Grand Mixed Use Project**	KS Properties, LLC Peter Sullivan (415)362-1700	13.3 acre site bounded by Mandela, W. Grand, Poplar, and 18th Street	3	▪1,577 residential units ▪approx. 300,000 non-residential S.F.	Scott Miller 238-2235	Environmental application filed. NOP published 04/06/06. Environmental Scoping Session before LPAB 04/17/06 and Planning Commission 04/19/06. DEIR published 12/18/06. DEIR hearings before Planning Commission 01/17/07 and LPAB 01/29/07. FEIR and response to comments published 06/29/07. Project inactive.
53	**Gateway Community Development Project (The Gateway)**	Pacific Thomas Capital Randall Whitney (925) 939-7401	East 12th St. between 25th Ave. and Derby St.; APN - multiple	5	▪810 residential units ▪26,000 S.F. commercial	Darin Ranelletti 238-3663	Application filed. NOP published 11/23/05.Environmental Scoping Session 12/07/05. DEIR published 08/10/07. DEIR hearing session 09/05/07. Project inactive.

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Application Approved							
54	**Mandela Transit Village**	Capital Stone Group Dr. Thomas Casey (510) 689-8094	1357 5th Street APN 000O-0390-010-07	3	▪120 residential units ▪38,500 S.F. commercial	Darin Ranelletti 238-3663	Originally approved by Planning Commission on 8/6/03. Re-approved by Planning Commission on 2/18/09. Extension granted 02/18/10.
55	**Macarthur BART Transit Village**	Macarthur Transit Community Partners, LLC Deborah Castles (510) 273-2002	7 acre site located between Telegraph, 40th, and Macarthur and Highway 24	1	▪624 residential units ▪42,500 S.F. retail/commercial space	Catherine Payne 238-6168	Planning Commission certification of the FEIR and project approval 06/04/08. City Council approval of the Rezoning on 07/15/08. Owner Participation Agreement and Development Agreement approval by City Council 07/21/09. Stage 1 FDP pending approval of the City council 12/21/10. Stage 2 FDP application filed 12/17/10. Planning Commission approval Stage 2 FDP 04/06/11. City Council approval of Stage 2 FDP 05/17/11. Stage 1 under construction.
56	**Oak to Ninth Mixed Use**	Oakland Harbor Partners, LLC Patrick Van Ness (925) 463-1122	64.2 acre waterfront site bounded by Fallon Street, Embarcadero Road, 10th Ave., and the Oakland Estuary APN: 0430-001-02, 0430-001-04 (por), 0460-003,004,0465-002, 0470-002 (por).	3 & 2	▪ General Plan Amendment from ▪Central City East Redevelopment Plan Amendment and Central District Urban Renewal Plan Amendment ▪ New Planned Waterfront Zoning District ▪ Zoning Map Amendments ▪3,100 residential units ▪200,000 S.F. commercial ▪3,950 structured parking spaces ▪29.9 acres public open space ▪2 renovated marinas; 170 boat slips ▪wetlands restoration area	Scott Miller 238-2235	DEIR published 09/01/05. Design Review Committee 01/25/06. FEIR published 02/01/06. PRAC 02/08/06. LPAB 02/27/06. Planning Commission approval 03/15/06. Appeal filed 3/24/06. City Council denial of the appeal and approval of the project, amendments, rezoning, etc 06/20/06 and 07/18/06. Under litigation. Revised EIR published 09/30/08. Revised EIR certified by City Council on 1/20/2009.

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57	**Wood Street (formerly Central Station) Mixed-Use Project**	Carol Galante BUILD West Oakland, LLC PCL Associates, LLC (415) 989-1111 Andy Getz HFH Central Station Village, LLC Central Station Land, LLC (510) 652-4191	West Oakland Station Site – 16th and Wood Streets APN: various	3	▪1557 residential units (including 186 live/work units) ▪13,000 S.F. commercial ▪1.39 acres public open space ▪2.82 acres private open space ▪Renovation of train station	Maurice Brenyah-Addow 238-6342	General Plan and Zoning Amendments required. DEIR published; Planning Commission certification of the FEIR and approval of the project 03/16/05. Appeal denied by City Council 05/17/05. Individual projects:Pacific Cannery Lofts, 14th Street Apartments, Zephyr Gate, HFH Apartments approved. Planning Commission zoning text amendments approved 07/20/11. City Council pending 10/18/11.City Council adoption 11/01/11. Ordinance No. 13093
58	**~Jack London Square Redevelopment**	Jack London Square Partners, Dean Rubinson, (415)391-9800	Eight Development areas within Jack London Square bounded by Alice, 2nd, Harrison, and Embarcadero. APN - Multiple	3	*Master Plan-* 1.2 million S.F. of mixed-use retail, commercial, and office Sites A-B,D,E,H, I: (1,700 seat movie theater, 250 room hotel, supermarkets, restaurants, and offices) Site C (10 Clay Street/505 Embarcadero West) (Ferry Landing) Site F (65 Harrison Street) (Jack London Market) Site G (255-2nd Street) (Jack London Parking Garage) 66 Franklin (Haslett Building)	Catherine Payne 238-6168	DEIR published 09/08/03; FEIR published 2/11/04. Planning Commission approval 03/17/04. City Council approval 04/04. Site C, F, and G completed. Pre-application 11/2012.
59	**1640 Broadway Mixed Use Project***	1640 Broadway Associates Marge Cafarelli (415) 512-8118	17th and Broadway 1640 Broadway APN: 008-0622-001-01	3	▪177,600 S.F. of office ▪4,710 S.F. ground floor retail ▪Structured parking ▪Alternative approved for 254 residential units with ground floor retail	Heather Klein 238-3659	Project approved 10/00; all residential alternative approved by Planning Commission 10/01. Administrative extension of approval granted for one year 10/04. Planning Commission re-approval 05/04/05. Vesting TPM approved 11/21/06. Extension granted 05/21/08.
60	**~Broadway West Grand (formerly known as Negherbon Mixed Use Project)***	Signature Properties Doug Park (925) 463-1122	2345 Broadway APN: 008 –0666-007-00	3	*Parcel B* ▪367 residential units ▪8,500 S.F. retail	Catherine Payne 238-6168	DEIR published 08/26/04. LPAB hearing 09/20/04. Planning Commission approval 10/06/04. TTM approval 06/20/06. Parcel B seeking amendments to the project. Design Review Committee 04/23/08. Planning Commission approval 06/04/08.PUD Application 03/2013.

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COMMERCIAL, INDUSTRIAL, CIVIC PROJECTS							
Pre-Application Discussions							
61	**Skilled Nursing Facility/ Medical Office/ Retail Sales**	Doug Davis (510)538-9991	1230 37th Ave APN: 033-2156-023	5	▪74,600 snf/med offices ▪3,100 sf of retail	Neil Gray (510)238-3878	Pre-application filed.
62	**Spanish Speaking Citizens Foundation**	Joe DeCredico (510)883-1521	1470 Fruitvale Ave APN: 033 -2121-023-00	5	▪40,000 S.F. 5-story civic building	Robert Merkamp 238-6283	Pre-application filed.
63	**Courthouse Condominiums (formerly 2935 Telegraph Ave.)**	MBH Architects (510) 865-8663	2935 Telegraph Ave.	3	▪95,000 sf medical office building	Maurice Brenyah-Addow 238-6342	Pre-Application filed for a potential alternate project see project number 26.
Application Submitted - Under Review							
64	**~Head Royce School**	Dennis Malone (510) 531-1300	4315 Lincoln Ave. APN: 029A-1367-006-01	4	Amendments to the PUD	Heather Klein 238-3659	Application filed. Under review.
65	**~Children's Hospital**	Doug Nelson (510) 428-3066	5714 Martin Luther King Jr. Way Bounded by Martin Luther King Jr. Way, 53rd St, and Highway 24. APN: multiple	2	Demolition of 11-residences, trailers, and helipad structure Construction of: ▪90,000 SF out-patient building ▪12,000 SF central plant ▪9,500 SF family residence ▪17,250 SF admin building ▪15,000 SF link building ▪120,000 SF Acute Care Pavilion ▪4 level parking structure with 324 stalls ▪Interior renovations	Heather Klein 238-3659	Application filed. Under review.
66	**~Shops at Broadway**	Lowney Architects (510)548-4637	3001-3039 Broadway APN: 009 -0705-004-00, 009 -0705-005-00, 009 -0705-007-00	3	▪35,750 s.f. retail ▪171 parking space n3 bike parking (10 in short-term)	Darin Ranelletti 238-3663	Application filed. NOP published 07/27/12. Planning Commission scoping hearing 08/29/12.
67	**~1800 San Pablo**	Sunfield Development LLC (510)452-5555	1800 San Pablo Ave APN: 008 -0642-006-00	3	▪120,000 S.F. commercial ▪309 auto fee parking spaces	Lynn Warner 238-6983	NOP published 10/7/11.DEIR published 7/6/12. FSEIR certified 1/14/12. Project has not been approved.
68	**~Safeway (Broadway @ Pleasant Valley)**	Benner Stange Associates Architects L. Owen Chrisman (530) 670-0234	5050-5100 Broadway APN: 014-1242-002-03, 014-1242-005-07	1	▪Redevelopment of existing shopping center with new 323,000 SF shopping center	Darin Ranelletti 238-3663	Application filed. NOP published 06/26/09. Environmental Scoping Session before Planning Commission 07/15/09. DEIR published 01/11/13. PC DEIR hearing 02/20/13.
69	**633 Hegenberger (formerly Coliseum Center)**	City of Oakland Redevelopment Agency	633 Hegenberger APN: 042-4218-001-16	7	▪Retail facility containing approx. 139,000 S.F.	Darin Ranelletti 238-3663	Application filed. Environmental scoping underway. Design Review Committee 08/13/08. Application revised 06/08/09. Project inactive.
Application Approved							
70	**~Oakland Army Base**	CCIG Prologis; City of Oakland; Doug Cole (510)238-7661	Maritime St. and W. Grand Ave. APN: multiple	3	Redevelop 160 acres with approx. 1.5 million sq. ft. of new industrial space.	Darin Ranelletti, 510-238-3663; Doug Cole, 510-238-7661	Master Plan and LDDA approved June 2012. Proposed rezoning under review.

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71	**St. John's Episcopal Church Parking and New Sanctuary**	St. John's Episcopal Church Jerry Moran (510)557-1015	5928 Thornhill Dr, 1707 Gouldin Rd APN: 048F-7390-003-03 048F-7390-004-09	4	▪Demolition of house at 5928 Thornhill Drive ▪new access bridge over creek ▪creek rehabilitation/bank stabilization ▪5,500 S.F. sanctuary	Caesar Quitevis 238-6343	Application filed. NOP and Initial Study published 03/06/08. DEIR published 11/17/10. PC DEIR hearing 12/15/10. FEIR published 5/23/12. PC approval and certification of the FEIR 6/6/12. Appeal #A12090 filed 06/18/12. Pending approval. Draft Facility Use Policy and Parking Policy Plan submitted 5.7.13 . Easement proposals between applicant and appellant neighbors filed with City.
72	**~Safeway (College Ave)**	Ken Lowney (510)836-5400	6310 College Ave APN: 048A-7070-001-01	3	▪New 50,000 SF grocery story and ground floor retail	Peterson Vollmann 238-6167	Application filed. NOP published 10/30/09. Environmental Scoping Session before Planning Commission 11/18/09. DEIR published 07/1/11. FEIR published 7/6/12. Approved 7/25/12. Appealed to City Council. City Council approved revised project 12/18/12.
73	**Replacement of Embarcadero Bridge**	City of Oakland (510)883-1521	80 Fallon Street, 1 5th Ave APN: 000O-0430-001-04 000O-0430-001-02	5	▪Replacement of the Embarcadero Bridge over Lake Merritt Channel	Michael Bradley 238-6935	Creek Protection Permit approved 01/03/11.
74	**Foothill Square Redevelopment Project**	Jay-Phares Corp. John Jay (510)562-9500	10700 Mac Arthur Boulevard APN: 047 -5589-001-00 047 -5589-001-06 047 -5589-001-05 047 -5589-001-04	7	▪Redevelopment of a commercial shopping center approx. 13.8 acres ▪72,000 S.F. supermarket	Aubrey Rose 238-2071	Planning Commission approval 05/04/11. Building permit #B1004457 issued. Under construction.
75	**~Alta Bates Summit Medical Center- Summit Campus Master Plan**	Alta Bates Summit Medical Center Shahrokh Sayadi (415)203-6345	23-acre campus generally between Telegraph and Webster, and between 30th Street and 34th Street APN - Multiple	3	ABSMC Master Plan Phase 1 nDemolition of the Merritt Classroom and other small buildings nConstruction of a new 230,000 S.F. (11-story) acute care hospital n1,090-space (7-story) parking garage. Phase 2 nLonger-term campus-wide improvements, new medical office buildings, classrooms and closure of a portion of Summit Street for development of a new campus plaza.	Scott Gregory (contract planner) (510) 535-6690	Application filed. NOP published 01/23/09. DEIR published 12/21/09. FEIR published 5/7/10. Planning Commission approval 05/19/10. Appealed to City Council. Council denial of the appeal and approval of the project 07/06/10. Under construction.

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76	**City Center T12 (2005)***	Shorenstein Realty Investors Tom Hart (415) 772-7000	11th/12th/MLK/Jefferson APN: 002-0027-007-00	3	▪Revision in program from 450 residential units to 600,000 S.F. office.	Lynn Warner 238-6983	Revision from residential units to office square footage. Design Review Committee 09/26/07. Planning Commission approval and Addendum certification 12/05/07. Building permit #B0803952. Project stopped construction. Redevelopment Agency renegotiated City Center DDA extending the completion requirements.
77	**~1100 Broadway**	Steven Wolmark SKS Investments (415)421-8200	1100 Broadway APN:002-0051-006-02	2	▪Rehabilitation of the Key System Building ▪310,285 S.F. of office ▪9,810 S.F. of retail.	Heather Klein 238-3659	LPAB on 11/5/07 and 12/10/07. Design Review Committee on 10/24/07. Planning Commission approval and Addendum certification 02/13/08. Extension granted 08/17/09. Extension granted 01/12. Extension granted 01/13.
78	**Lake Merritt Channel Wetland and Widening Project**	City of Oakland	Lake Merritt Channel between Lake Merritt and I-880 APN: 000O-0450-001, 002, 000O-0455-001-01, 001-07, 008-05,012, 013, 015-02	2	▪Widening and tidal restoration improvements along Lake Merritt in association with the 12th Street Reconstruction Project, 10th Street Bridge Project, and Lake Merritt Channel Improvement Project at the 7th Street Flood Control Station.	Lesley Estes, Watershed Improvement Program Supervisor, 238-7431	DEIR published 04/14/05; Planning Commission hearing DEIR 5/17/05. Planning Commission certification of the FEIR and project approval 07/05/06. This project also is included in the Measure DD EIR. The DEIR for Measure DD was published 07/20/07. The Planning Commission certification of the FEIR 02/13/08. Appeal denied by City Council 04/01/08. Project under construction.

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Complied by Planning and Zoning, (510) 238-3941.

79	**Kaiser Permanente**	Kaiser Permanente Judy DeVries (510) 752-2004	Generally the area surrounding the intersection of Broadway and Macarthur Boulevard.	1 and 3	▪Master Plan for new Hospital *Phase II* ▪ 1,216 space parking structure ▪ Hospital building (346 beds, approx. 1.06 MSF) ▪ Central utility plant *Phase III* n Demolition of existing hospital tower and low-rise (except for recent Emergency Department addition and Fabiola Building) ▪ Conversion of ground-floor parking on Site 7 (38 spaces) to accommodate an additional 6,000 SF. of retail ▪ Conversion of Emergency Department addition to temporary medical services use ▪ Construction of parking lot of approximately 189 spaces ▪ Construction of a new Central Administration MSB (approx. 60,000 SF)	Scott Gregory (contract planner) (510) 535-6690	Planning Commission certification of the FEIR and approval of the project 06/07/06. City Council approval of GPA, RPA and re-zoning 6/27/06. Planning Commission approval of the design of Phase I MOB 11/1/06. Design Review Committee for Phase II Hospital 12/12/07 and 5/28/08. Planning Commission approval of Design review for Phase 2 Hospital 11/19/08. Building Permits for hospital sent to OSHPD review. Demolition permit, Grading permit, and Building permit for garage issued. Project under construction.
80	**City Center T5/T6 (2005)**	Shorenstein Realty Investors Nick Loukianoff (415) 772-7062	11th/12th/Clay/Broadway APN: 002-0097-038-00 through 002-0097-040-00	3	▪600,000 S.F. office ▪7,500 S.F. commercial	Patrick Lane 238-7362	Planning Commission approval of PPUD 4/00.

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SUCCESSFUL COMPLETIONS							
Residential Projects							
1	**720 E 11th Street**	Robert Stevenson (415)786-6631	720 E 11th Street APN: 019 -0033-010-02	2	▪55 affordable units	Moe Hackett 238-3973	Project completed
2	**~116 6th St***	Affordable Housing Associates Adam Deromedi (510) 649-8500	116 6th Street 609 6th Street APN: 001-0173-009-00	2	▪70 senior affordable apartment units	Heather Klein 238-3659	Project completed.
3	**~Arcadia Park**	Pulte Homes Andy Cost (925) 249-3200	98th Ave. at San Leandro St., APN - multiple	7	▪168 residential units (previously approved for 366 residential units)	Darin Ranelletti 238-3663	Project completed.
4	**Lion Creek Crossing (formerly Coliseum Gardens)**	EBALDC Carlos Castellmos (510) 287-5335	66th Ave. at San Leandro Street APN-Multiple	6	*Phase IV* ▪72 residential units	Catherine Payne 238-6168	Project completed
5	**HFH Apartments**	Andy Getz (510)652-4191	1401-1405 Wood Street APN: 000O-0310-012-00	3	▪*Phase I* 159 apartments ▪*Phase II* 142 apartments	Don Smith, Bldg. Permits, 238-4778	Project completed.
6	**Tassafaronga Village**	Housing Authority of the City of Oakland Bridget Galka (510)587-2142	68–81st Ave. & 1001 83rd Ave. APN:042 -4281-007-04 042 -4280-001-01 041 -4206-001-00	7	▪General Plan Amendment from Business Mix to Mixed Housing Type ▪Redevelopment Plan Amendment from Industrial to Residential ▪Rezoning ▪179mixed housing residential (apartment, live/work, for sale, and affordable)	Aubrey Rose 238-2071	Project completed.
7	**City Walk City Center T10 (2005)***	Alta City Walk, LL (415)888-8075	13th/14th/MLK/Jefferson APN: 002-0029-001-00	3	▪3,000 S.F. retail ▪252 residential units	Patrick Lane, Redevelopment Agency 238-7362 Don Smith, Bldg. Permits, 238-4778	Project completed.
8	**Ironhorse Apartments at Central Station (formerly 14th Street Apartments -Wood Street)**	Bridge Housing Ben Metcalf (415)989-1111	Portions of APN: 0006-0029-001 and 0000-0315-006.	3	▪99 Affordable housing units	Don Smith, Bldg. Permits 238-4778	Project completed.
9	**Altenheim Senior Housing**	Citizens Housing Corporation Kaori Tokunhea (415) 421-8605	1720 Macarthur Boulevard APN: 023-0494-001-07	5	*Phase II* ▪ 83 apartments units (new construction)	Joann Pavlinec 238-6344	Project completed.

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10	**Housewives Market***	A. F. Evans Steve Kuklin (415) 591-2204	8th/9th/Clay and Jefferson 801-807 Clay Street APN: 001-0209-001, 002, 003, 004	3	*Phase II* ▪72-86 condominium units ▪14,000 S.F. flexible space	Don Smith, Bldg. Permits 238-4778	Project completed.
11	**630 Thomas Berkley Square Housing ***	SUDA/ Alan Dones (510) 715-3491	630 Thomas L. Berkley Way APN: N/A - TPM7541 Parcel 3	3	▪88 residential condominium units ▪3 commercial spaces	Heather Klein, Major Projects, 238-3659	Project completed.
12	**1755 Broadway***	1755 Broadway LLC Andrew Brog (310)963-7878	1755 Broadway APN:008 -0640-005-00	3	▪Conversion of floors 2-5 of office to 24 live/work condominiums.	Mike Rivera, 238-6417	Project completed.
13	**Fox Courts**	Deni Adaniya (510) 841.4410, ext.19	Uptown Parcel 6 555-19th Street, 550-18th Street APN 008-0642-017	3	80 residential units; 2500 S.F.; childcare; art space	Catherine Payne, Major Projects, 238-6168	Project completed.
14	**311 2nd St***	Embarcadero Pacific Michael Reynolds (510) 444-4064	311 2nd Street APN:001 -0149-007-00	3	▪105 residential condominium units	Heather Klein, Major Projects, 238-3659	Project completed.
15	**100 Grand***	Essex Property Trust John Eudy (650) 849-1600	124 Grand Ave and 2264 Webster St. APN: 008-0655-007-00 & 008-0655-009-01	3	▪241 residential units	Darin Ranelletti, Major Projects, 238-3663	Project completed.
16	**Siena Hills**	Hillside Homes Edward Patmont (925) 946-0583	Between Rilea Way and Greenridge Drive on Keller Ave. APN: 04A-3457-033-01	6	▪10 single-family homes	Heather Klein, Major Projects, 238-3659	Project completed.
17	**Pacific Cannery Lofts**	PCL Associates Cal Inman (510)547-2122	1111-1119 Pine Street APN: 006-0029-002-00	3	▪99 condo warehouse lofts ▪45 live/work lofts ▪15 townhouse lofts ▪4 work/live lofts (part Wood Street Development)	Don Smith, Bldg. Permits 238-4778	Project completed.
18	**Zephyr Gate -Wood Street**	Pulte Homes (925) 249-3268	Wood Street APN: 006-0029-001-00	3	▪130 residential condominium units	Don Smith, Bldg. Permits 238-4778	Project completed.
19	**3860 Martin Luther King Jr. Way**	Neil Cotter (650) 259-9303	3860 & 3880 Martin Luther King Jr. Way APN: 012-0968-030-01 012-0968-031-00	1	▪34 residential units	Darin Ranelletti, Major Projects, 238-3663 Kathy Kleinbaum, Redevelopment Division, 238-7185	Project completed.
20	**Jackson Courtyard Condominiums***	Gerald Green (415)377-5286	210 – 14th Street APN 008 –0627-020-00	3	▪45 condominium units	Heather Klein, Major Projects, 238-3659	Project completed.

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21	**Uptown Project ***	Forest City Residential, Inc. Susan Smartt (415) 836-5980	Area bounded by San Pablo, Telegraph, 18th and 20th Streets APN - Multiple	3	▪Parcel I ▪Parcel II ▪Parcel III ▪Park	Catherine Payne, Major Projects, 238-6168	Project completed.
22	**Lion Creek Crossing (formerly Coliseum Gardens)**	EBALDC Carlos Castellmos (510) 287-5335	66th Ave. at San Leandro Street APN-Multiple	6	▪283 residential units ▪7,500 S.F. of civic and commercial space ▪park	Catherine Payne, Major Projects, 238-6168	Phase I-III completed
23	**Monte Vista Villas (formerly Leona Quarry)**	The DeSilva Group David Chapman (925) 828-7999	7100 Mountain Boulevard APN: 037A-3151-001-01	6	▪209 residential units ▪3,350 S.F. community center	Bill Quesada, Building Services, 238-6345	Project completed.
24	**Packard Lofts* (formerly 2355 Broadway)**	2355 Broadway LLC John Protopappas (510) 452-2944	2355 Broadway APN: 008-0666-006-00	6	▪Adaptive re-use of historic building into 24 condominiums and ground floor retail	Heather Klein, Major Projects, 238-3659	Project completed.
25	**46th Street Lofts (formerly Flecto Project)**	Levin, Menzies, Kelly Paul Menzies (925) 937-4111	47th and Adeline; land area is in both Oakland and Emeryville. 119 Linden Street APN: 049-1172-002 013-1172-003 013-1172-004	1	▪79 units and 3,000 S.F. commercial space ▪Adaptive reuse of and addition to the former Flecto building.	Catherine Payne, Major Projects 238-6168	Project completed.
26	**The Ellington* (formerly 3rd/Broadway Mixed Use)**	The Enterprise Group Walter Cohen (415) 221-2534	200/210/228 Broadway APN: 001 –0141-002-01 001 –0141-011-00	3	▪134 residential units ▪11,000 S.F. retail	Heather Klein, Major Projects 238-3659 Don Smith, Bldg. Permits 238-4778	Project completed.
27	**901 Jefferson***	Pyatok Architects Inc Gary Struthers (510)465-7010	901& 907 Jefferson Street APN: 002-0025-007-00 through 002-0025-009-00	3	▪75 condominium units ▪1,030 S.F. retail	Darin Ranelletti, Major Projects, 238-3663	Project completed.
28	**Madison Lofts***	Affordable Housing Associates Mark Garrel (510) 649-8500	160 14th St. APN: 008-0628-005-01	3	▪Approximately 76 condominium units ▪2,666 S.F. of retail	Neil Gray 238-3878	Project completed.
29	**8 Orchids***	BayRock Residential Marilyn Ponte (510) 594-8811	620-636 Broadway APN: 001-0197-002-00	2	▪3,600 S.F. retail ▪157 condominium units	Heather Klein, Major Projects, 238-3659	Project completed.
30	**Mandela Gateway Townhomes**	Bridge Housing Kristy Wang (415) 989-1111	1431 8th Street APN: 004-0067-021-00	3	▪14 condominiums	Heather Klein, Major Projects, 238-3659	Project completed.
31	**66th & San Pablo**	The Olson Company (925) 242-1050	6549 San Pablo Ave APN: 016-1506-001-02	1	▪72 condominium units	Lynn Warner, Major Projects, 238-6983	Project completed.

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32	**288 Third Street* (formally 300 Harrison Street)**	Signature Properties Chris Weekley (925) 463-1122	300 Harrison Street APN: 001-0153-016	3	▪91 condominiums units	Joann Pavlinec, Major Projects, 238-6344	Project completed.
33	**Altenheim Senior Housing**	Citizens Housing Corporation Kaori Tokunhea (415) 421-8605	1720 Macarthur Boulevard APN: 023-0494-001-07	5	▪ 93 apartment units ▪ Rehabilitation of existing historic buildings	Joann Pavlinec, Major Projects, 238-6344	Phase I completed.
34	**206 Second Street***	MV Jackson Robison Brown (415) 284-1200	206 Second Street APN: 001-0157-003-00	3	▪2,380 S.F. of live/work ▪1,310 S.F. of retail space ▪75 condominium units	Heather Klein, Major Projects, 238-3659	Project completed.
35	**1511 Jefferson ***	Meritage Homes of California Randall Harris (925) 256-6042	1511 Jefferson Street APN:003-0071-006-00	3	▪78 condominium units	Robert Merkamp 238-6283	Project completed.
36	**Wheelink Project***	Jordan Real Estate Wayne Jordan (510) 663-3865	4th and Alice Street; JLS District 426 Alice Street APN 001 –0155-001-00	3	▪94 residential units ▪9,800 S.F. office	Scott Miller,238-2235 Don Smith, Bldg. Permits 238-4778	Project completed.
37	**Ford Street Lofts**	Signature Properties (905) 436-9350	3041, 3061, and 3065 Ford Street APN: 025-0666-002-00	5	▪81 condominium residential units	Scott Miller 238-2235	Project completed.
38	**Lincoln Court Senior Housing**	Domus Development 415-558-9500	2400 Macarthur Blvd APN: 029 -0993-020-01	4	▪82 senior housing apartment units	Robert Merkamp 238-6283	Project completed.
39	**Housewives Market***	A.F. Evans Steve Kuklin (415) 591-2204	8th/9th/Clay and Jefferson 801-807 Clay Street APN: 001-0209-001, 002, 003, 004	3	*Phase I* ▪Between 102 -111 condominium units ▪11,000 S.F. flexible space n3,000 S.F. of retail ▪Structured parking	Don Smith, Bldg. Permits 238-4778	Project completed
40	**Aqua Via* (Harbor View or Second Street Lofts)**	Urban Developments Marge Cafarelli (415) 512-8118	121-129 2nd Street APN: 001-0165-015-00	3	▪100 condominium units ▪5,190 S.F. of commercial / office	Heather Klein, Major Projects, 238-3659	Project completed.
41	**Cotton Mill Studios**	Tom Dolan Architects (510) 839-7200	1091 Calcot Place APN: 019-0055-001-04	5	▪74 unit live/work conversion	Joann Pavlinec, Major Projects, 238-6344	Project completed.
42	**Glascock Residential Project "The Estuary"**	Signature Properties Patrick Van Ness (925) 463-1122	2893 Glascock at Derby 4.1 Acres APN: 025-0674-001-00 025-0674-002-00 025-0674-003-00	5	▪100 residential units	Scott Miller 238-2235	Project completed.

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43	**Green City Loft Project**	Green City Development Martin Samuels (510) 635-7698	41st and Adeline; land area is in both Oakland and Emeryville. 1007 41st Street APN: 012 –1022-001-00	1	▪62 lot units on former office/warehouse site	Don Smith, Bldg. Permits 238-4778	Project completed
44	**City Limits Project (Formerly FABCO)**	Pulte Homes Dennis O'Keefe (925)249-3218	1165 and 1249 67th Street west of San Pablo Ave. APN: 049-1507-004-00 016 –1507-008-03 016 –1507-009-02	1	▪92 condominium residential units	Scott Miller 238-2235	Project completed.
45	**Palm Villas Residential Project**	Em Johnson Interest (510) 839-3057	9001-9321 MacArthur Blvd. APN: 047-5484-006-04, 007-03, 010-02, 011, 012, 013, 022-01, 022-02, 023	7	▪78 single family homes	Don Smith, Bldg. Permits, 238-4778	Project completed.
46	**Ettie Street/Mandela Parkway**	David Baker Architects (415) 896-6700	2818 Mandela Parkway APN: 007-0587-002-05	3	▪91 live/work units	Don Smith, Bldg. Permits, 238-4778	Project completed
47	**Arioso Project***	SNK Development (415) 896-1186	901 Franklin Street APN: 002-0096-004-00	2	▪88 condominium units ▪6,000 S.F. commercial structured parking	Don Smith, Bldg. Permits 238-4778	Project completed
48	**Mandela Gateway Gardens (formerly Westwood Gardens)**	Oakland Housing Authority and Bridge Housing Pete Nichol (415) 989-1111	1431 7th Street APN: 004-0067-021-00	3	▪200 residential units (40 units in replacement of existing Westwood Gardens) 15,000 S.F. of retail space - combination rental and ownership; Some live/work units.	Heather Klein, Major Projects, 238-3659	Project completed.
49	**Telegraph Gateway Project ***	Tom Dolan Architects Scott Galka (510) 839-7200	Telegraph Ave. and 24th Street 2401 Telegraph Avenue APN: 008-0675-004-00	3	▪50 new residential lots ▪5,300 S.F. ground floor retail	Don Smith, Bldg. Permits 238-4778	Project completed.
50	**Durant Square**	Signature Properties (925) 463-1122	International Blvd. And Durant Ave. 10970 International Blvd. APN: 047-5519-043-00	7	▪43 new single family ▪168 new townhouses ▪40 new live/work (60 total) ▪Food 4 Less ▪Renovated building with continued commercial uses	Heather Klein, Major Projects, 238-3659 Bill Quesada, Building Permits, 238-6345	Project completed.
51	**Preservation Park III***	Signature Properties (905) 436-9350	11th – 12th and MLK on a vacant parcel 655 12th Street APN: 002-0021-011-01 002-0021-012-00	3	▪92 residential townhouses	Don Smith, Bldg. Permits, 238-4778	Project completed.

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52	**San Pablo Affordable Senior Housing**	Oakland Community Housing Inc. (510) 763-7676	3255 San Pablo Avenue between 32nd and 34th Streets APN: 005-0470-017-01	3	▪ 50+ residential units	Don Smith, Bldg. Permits 238-4778	Project completed.
53	**Bridge Housing – Linden Court**	Bridge Housing (415) 989-1111	1089 26th Street. Near McClymonds High School in West Oakland APN: 005-0435-001-00	3	▪Low-income housing (approx. 79 units)	Don Smith, Bldg. Permits 238-4778	Project completed.
54	**Bridge Housing - Chestnut Court**	Bridge Housing (415) 989-1111	2240 Chestnut Street, at West Grand APN: 005-0428-001-00	3	▪Hope IV project in conjunction with OHA ▪58 affordable rental housing units ▪6 affordable for sale housing units ▪14 loft units, 4,000 S.F. retail ▪4,000 S.F. supportive services	Don Smith, Bldg. Permits 238-4778	Project completed.
55	**The Essex - Lake Merritt***	Lakeshore Partners Tom Peterson (510)-444-7191	17th and Lakeshore 108 - 17th Street APN: 008-0633-002-01	2	▪270 residential units	Don Smith, Bldg. Permits 238-4778	Project completed.
56	**Safeway Building***	Reynolds & Brown Dana Perry (925) 674-8400	4th and Jackson Streets 201 4th Street APN: 001-0155-008-00	3	▪Reuse existing warehouse and add new top floor for approximately 46 live/work units ▪4,500 S.F. ground floor commercial ▪6,500 S.F. office	Don Smith, Bldg. Permits, 238-4778	Project completed.
57	**Allegro Project***	SNK Development (415) 896-1186	3rd and Jackson Streets 208 Jackson Street APN:001-0159-006-00	3	▪312 units ▪13,500 S.F. commercial ▪4 new buildings	Don Smith, Bldg. Permits, 238-4778	Project completed.
Mixed-Use Projects							
58	**Kaiser Center**	Tomas Schoenberg The SWIG Company (415)291-1100	300 Lakeside Drive Area bounded by 20th and 21st Streets and Webster and Harrison Streets	3	▪Demolition of 280,000 S.F. ▪2 new towers:42-stories with 780,000 S.F. office 34-stories with 565,000 S.F. office and 22,000 S.F. retail	Heather Klein 238-3659	Project completed.
59	**Seven Directions**	Pyatok Architects Inc, Curtis Caton, (510)465-7010	2946 International Boulevard APN: 025-0716-012-00	3	▪38 housing units ▪20,115 S.F. clinic space	Joann Pavlinec, Major Projects, 238-6344	Project completed.
59	**Broadway West Grand (formerly known as Negherbon Mixed Use Project)***	Signature Properties Doug Park (925) 463-1122	2345 Broadway APN: 008 –0666-007-00	3	*Parcel A* ▪132 residential units ▪21,300 S.F. retail	Catherine Payne, Major Projects, 238-6168	Project completed.

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60	**Dreyer's Site Residential Lofts* The Sierra**	COD Builders Kava Massih (510)644-1920	311 Oak Street APN: 001-0163-012-00	3	▪220 units ▪30,000 S.F. commercial	Don Smith, Bldg. Permits 238-4778	Project completed.
61	**Fruitvale Transit Village Phase I**	FDC, Evelyn Johnson, (510) 535-6911	Fruitvale BART Station	5	▪Masterplan for residential and commercial/civic use and new parking structure	Darin Ranelletti, Major Projects, 238-3663	Project completed.
Commercial, Industrial, and Civic Projects							
62	**Aspire Public Schools**	Charles Robitaille 925-698-1118	1009 66th Ave APN:041-4056-003-00	6	▪Demolish vacant industrial building/construct a school with 420 students	Aubrey Rose 238-2071	Project completed.
63	**East Oakland Sports Center**	City of Oakland Community and Economic Development Agency Project Delivery Division Lyle Oehler (510) 238-3389	9175 Edes Avenue APN: 044-5053-001-06	7	▪Phased Master Plan for a sports center at Ira Jinkins Park. *Phase 1* ▪26,000:indoor swimming pool/water slide (natatorium), a dance/exercise room, a multi-purpose room/learning center, and other accessory activities. If funded a fitness/weight room and two outdoor basketball courts *Phase II* ▪23,000 square foot facility and outdoor amenities	Lynn Warner 238-6983	Project completed.
64	**Auto Chlor System**	Tulloch Construction Brian Tulloch (510) 655-3400	1325 14th Street APN: 005-0375-002-01, 005-0373-010-03, 005-0373-005-	3	▪64,512 S.F. concrete tiltup light manufacturing building	Ulla-Britt Jonsson, 238-3322	Project completed.
65	**Kaiser Permanente**	Kaiser Permanente Judy DeVries (510) 752-2004	Generally the area surrounding the intersection of Broadway and Macarthur Boulevard.	1 and 3	*Phase I* West Broadway Medical Services Building and Garage	Scott Gregory (contract planner) (510) 535-6690	Project completed.
66	**Jack London Square Redevelopment**	Jack London Square Partners, Stuart Richard, (415)391-9800	Eight Development areas within Jack London Square bounded by Alice, 2nd, Harrison, and Embarcadero. APN - Multiple	3	▪commercial, office, and parking	Catherine Payne, Major Projects, 238-6168	Site C, G and F completed.
67	**Fox Theater**	City of Oakland Redevelopment Agency	1807-1829 Telegraph Ave APN: 008 -0642-001-00	3	▪Rehabilitation of the historic theater ▪20,000 S.F. addition	Joann Pavlinec, Major Projects, 238-6344	Project completed.
68	**Head Royce School**	John Malick & Associates John Malick (510)595-8042	4315 Lincoln Ave APN: 029A-1367-004-04	4	▪Development of the Masterplan	Heather Klein, Major Projects, 238-3659	Project completed.
69	**Cathedral of Christ the Light**	CMA Eileen Ash (415) 597-8414	2121 Harrison Street and Grand Avenue APN:008-0653-024	3	■ 255,000 S.F. Cathedral	Catherine Payne, Major Projects, 238-6168	Project completed.

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70	**Center 21**	John Sutton Prentiss Properties (510)465-2101	2100 Franklin Street APN:008 -0651-003-01	3	▪15,000 S.F. retail ▪218,000 S.F. office	Catherine Payne, Major Projects, 238-6168	Project completed.
71	**Cox Cadillac Mixed Use**	Bond Company Robert Bond (312) 853-0070	Intersection of Harrison St., 27th and Bay Place 230 Bay Place APN 010 –0795-027-01	3	▪56,000 S.F. commercial ▪Renovation of historic Cadillac Showroom	Joann Pavlinec, Major Projects, 238-6344 Don Smith, Bldg. Permits, 238-4778	Project completed.
72	**66 Franklin Street***	Komorous-Towey Klara Komorous (510)446-2244	66 Franklin Street APN:001-0060-322	3	▪Renovation of existing building with approximately 95 S.F. of commercial	Joann Pavlinec, Major Projects, 238-6344	Project completed.
73	**17th Street Parking Garage**	California Commercial Investments Phil Tagami (510) 268-8500	16th and 17th Streets and San Pablo Avenue 1630 San Pablo APN: 008 –0620-015-00 008 -0620-014-00 008 –0620-009-01	3	▪+330 -space parking garage	Heather Klein, Major Projects, 238-3659 Patrick Lane, Redevelopment, 238-7362	Project completed.
74	**Thomas Berkley Square**	SUDA/ North County Center for Self Sufficiency Alan Dones (510) 715-3491	San Pablo Ave between MLK Jr. Way, Thomas L. Berkley Way, and 21st Street. 630 20th Street APN: 008-0645-015-01 008-0645-01801 and 02 0080645-019 through 025	3	▪ 114,000 S.F. office for the Alameda County Social Services Division and the North County Self Sufficiency Center ▪ 5,000 S.F. of retail	Heather Klein, Major Projects, 238-3659 Don Smith, Bldg. Permits 238-4778	Project completed.
75	**Infiniti of Oakland**	Hendricks Automotive Ron Tye (925) 463-9074	Oakport Road at Hassler Way APN: 034-2295-005-04	7	▪ New automotive dealership	Heather Klein, Major Projects, 238-3659	Project completed.
76	**Perkins Street Residential Care**	A.F. Evans John Rimbach (510) 891-444-7191	468-484 Perkins St. APN: 010-0767-014-00	3	▪56 room care facility for elderly residents	Don Smith, Bldg. Permits 238-4778	Project completed.
77	**Rainin Instruments**	Carl Groch, (415) 592-3950	Edgewater Drive & Hassler Road 7500 Edgewater Drive	7	▪180,000 S.F. office/manufacturing/R&D facility	Tanya Boyce, Redevelopment, 238-7322	Project completed.
78	**Lexus Dealership**	Lance Gidel (408) 370-0280	Oakport St. at Hassler Way APN: 034-2295-005-04	7	▪22,000 S.F. building for auto sales, service, repair of parts ▪Outdoor auto sales lot for 275-290 cars	Heather Klein, Major Projects, 238-3659	Project completed.
79	**Zhone Technologies**	Joe Ernst (510) 864-5985	66th Avenue and Oakport Street 7195 Oakport	7	▪300,000 S.F. high-tech research and development campus	Don Smith, Bldg. Permits, 238-4778	Project completed.

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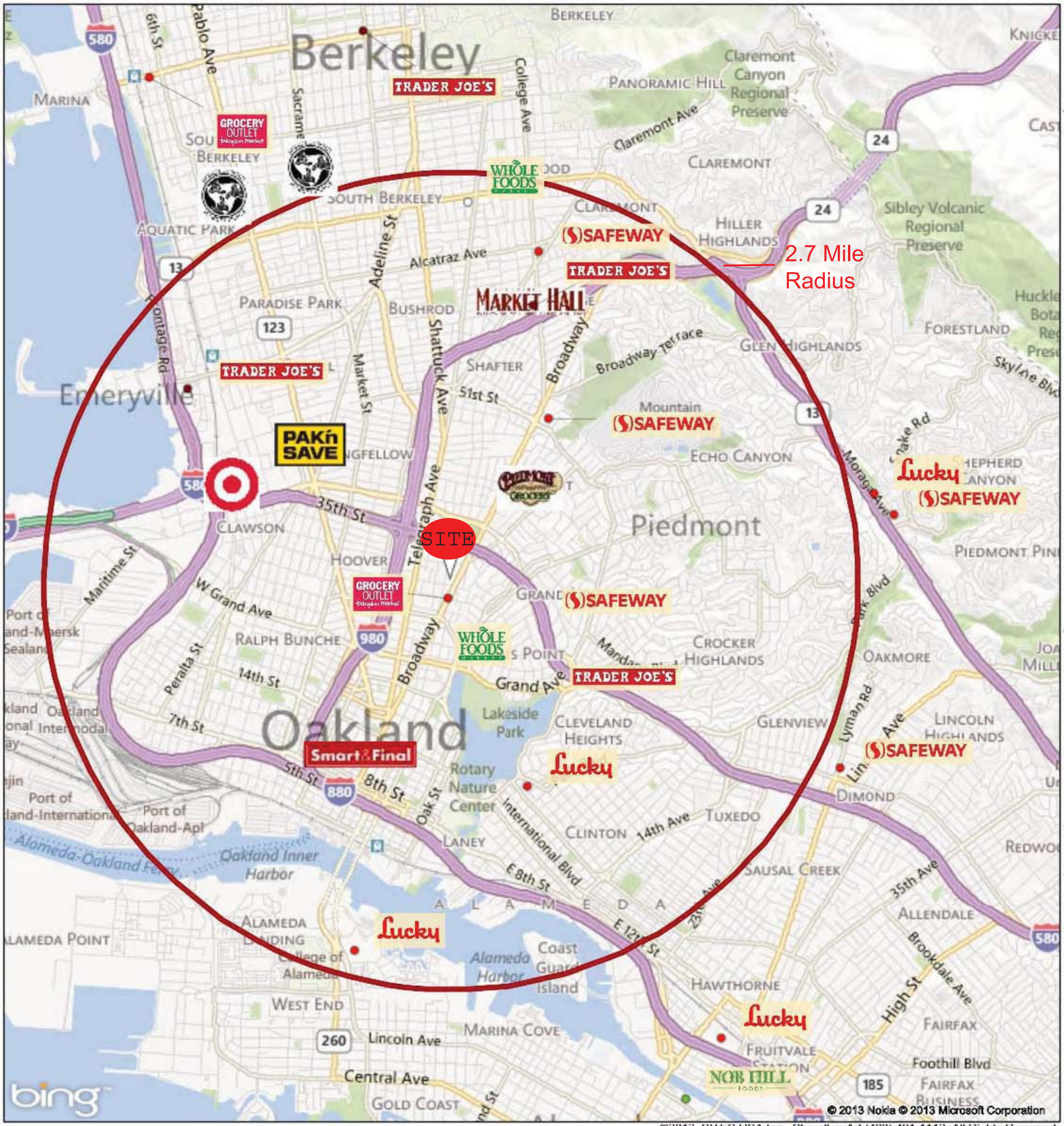
May 2013

80	**Just Desserts**	Just Desserts John Schmiedel (415) 864-6450	550 85th Avenue APN: 042 –4313-001-00	7	▪64,525 S.F. bakery and warehouse	Don Smith, Bldg. Permits, 238-4778	Project completed.
81	**City Center T9 (2000)**	Shorenstein Realty Investors Nick Loukianoff (415) 772-7062	$11^{th}/12^{th}$/Clay/Jefferson APN: 002-0033-006-00 through 015-00	3	▪450K office ▪7,500 S.F. retail	Don Smith, Bldg. Permits 238-4778	Project completed.
82	**Extended Stay American Hotel – OTR Site**	Extended Stay America Dan Stearns (425) 603-1530	Yerba Buena and Mandela Parkway APN: 007-0617-014-01	3	▪149 hotel rooms	Don Smith, Bldg. Permits, 238-4778	Project completed.
83	**Courtyard by Marriott Hotel**	Marriott, Don Celli (916) 369-4050	350 Hegenberger Road	7	▪154-room hotel	Don Smith, Bldg. Permits, 238-4778	Project completed.
84	**Oakland Garden Hotel (Courtyard Marriott)**	Michael Chan Oakland Garden Hotel (510) 251-6440	9^{th} and Broadway 900 Broadway APN: 002-0094-002-00	2	▪150-room hotel	Don Smith, Bldg. Permits 238-4778	Project completed.
85	**1111 Jackson Street – Phase I**	Peter Wong (510) 628-9060	1111 Jackson Street APN 002-75-002-00	2	▪Renovation of existing 111,000 S.F. State office building	Don Smith, Bldg. Permits, 238-4778	Project completed.
86	**Rotunda Building Reuse**	Phil Tagami (510) 268-8500	1500 Broadway APN: 008-0619-004-01	3	▪Rehabilitation of historic building for office & commercial uses ▪187,000 S.F. office ▪50,000 S.F. retail	Don Smith, Bldg. Permits, 238-4778	Project completed.
87	**IKEA Parking Structure**	Ikea Property, Inc. Doug Pass (925) 249-0317	Shellmound at I-80 4300 Shellmound Street	3	▪Additional 3-level parking structure for 800 cars in portion of existing surface parking lot	Don Smith, Bldg. Permits, 238-4778	Project completed.
88	**Best Buy Retail Store**	Best Buy – Architects MBH – Sherry Fraiser (510) 865-8663	Yerba Buena and Mandela Parkway (Portion of OTR site) APN: 007-0617-014-01	3	▪45,000 S.F. Best Buy retail store proposed	Don Smith, Bldg. Permits, 238-4778	Project completed.
89	**Expo Design Center**	Mike Abate (714) 940-5810	Horton St., East Bay Bridge Shopping Center. Part of Oakland/Emeryville JPA	3	▪KMART vacating present store ▪Home Expo Center has assumed lease. ▪Exterior / interior remodeling	Don Smith, Bldg. Permits, 238-4778	Project completed.
90	**Edgewater Distribution Center**	AMB Property Corp.	7200 Edgewater Drive APN: 041 –3902-003-17	7	▪406,700 S.F. warehouse/industrial use	Port of Oakland Commercial Real Estate 627-1210	Project completed.
91	**~Oakland Zoo (Master Plan Amendment)**	East Bay Zoological Society Nik Haas-Dejehia (510) 623-9525 x138	9777 Golf Links Rd APN - multiple	7	▪Revisions to the Oakland Zoo Master Plan previously approved in 1998	Darin Ranelletti 238-3663	Project completed.

*** 10K PROJECT (project includes residential units located in Downtown)**
~Denotes new project, a recent change to the project description, or status.
Complied by Planning and Zoning, (510) 238-3941.

APPENDIX C

Air Quality Technical Background



Lat: 37.82095 Long: -122.25282 Zoom: 7.00 mi

Logos are for identification purposes only and may be trademarks of their respective companies.

3001 Broadway

Competition Map

June 2013

30th and Broadway

This map was produced using data from private and government sources deemed to be reliable. The information herein is provided without representation or warranty

Prior 12 months water use in gallons	115940
(Sunnyvale Sprouts)	144364
	96492
	187000
	141372
	125664
	74052
	38896
	202708
	332112
	287980
	114444
Total:	1,861,024

Assume 3% outdoor ude (CalEEMod default)

Out door	55830.72
Indoor	1,805,193

Prior 12 months natuural gas use in therms	419	
(Sunnyvale Sprouts)	760	
	1504	
	1606	
	1137	
	554	
	223	
	242	
	201	
	205	
	251	
	231	
Total:	7,333	Therms
	733,300	kBTU
	28.20	k btu/sf

Assume 67% Title 24 use (CalEEMod default)

Title 24	18.90	
Non-Title 24	9	

APPENDIX D

Biological Resources Supplemental Information

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S3	WL
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	SSC
Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070	None	None	G2?	S2?	1B.2
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Archoplites interruptus Sacramento perch	AFCQB07010	None	None	G3	S1	SSC
Arctostaphylos pallida pallid manzanita	PDERI04110	Threatened	Endangered	G1	S1	1B.1
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T2	S2	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC
Atriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Branta hutchinsii leucopareia cackling (=Aleutian Canada) goose	ABNJB05035	Delisted	None	G5T4	S2	
California macrophylla round-leaved filaree	PDGER01070	None	None	G2	S2	1B.1
Calochortus pulchellus Mt. Diablo fairy-lantern	PMLIL0D160	None	None	G2	S2	1B.2
Calystegia purpurata ssp. saxicola coastal bluff morning-glory	PDCON040D2	None	None	G4T2	S2.2	1B.2
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2.1
Chloropyron maritimum ssp. palustre Point Reyes bird's-beak	PDSCR0J0C3	None	None	G4?T2	S2.2	1B.2
Chorizanthe cuspidata var. cuspidata San Francisco Bay spineflower	PDPGN04081	None	None	G2T2	S2.2	1B.2
Chorizanthe robusta var. robusta robust spineflower	PDPGN040Q2	Endangered	None	G2T1	S1	1B.1
Cicindela hirticollis gravida sandy beach tiger beetle	IICOL02101	None	None	G5T2	S1	
Cicuta maculata var. bolanderi Bolander's water-hemlock	PDAPI0M051	None	None	G5T3T4	S2	2.1
Circus cyaneus northern harrier	ABNKC11010	None	None	G5	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Cirsium andrewsii Franciscan thistle	PDAST2E050	None	None	G2	S2.2	1B.2
Clarkia concinna ssp. automixa Santa Clara red ribbons	PDONA050A1	None	None	G5?T3	S3.3	4.3
Clarkia franciscana Presidio clarkia	PDONA050H0	Endangered	Endangered	G1	S1	1B.1
Danaus plexippus monarch butterfly	IILEPP2010	None	None	G5	S3	
Dipodomys heermanni berkeleyensis Berkeley kangaroo rat	AMAFD03061	None	None	G3G4T1	S1	
Dirca occidentalis western leatherwood	PDTHY03010	None	None	G2G3	S2S3	1B.2
Egretta thula snowy egret	ABNGA06030	None	None	G5	S4	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eriogonum luteolum var. caninum Tiburon buckwheat	PDPGN083S1	None	None	G5T2	S2	1B.2
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S2S3	SSC
Euphydryas editha bayensis Bay checkerspot butterfly	IILEPK4055	Threatened	None	G5T1	S1	
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Geothlypis trichas sinuosa saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T2	S2	SSC
Gilia capitata ssp. chamissonis blue coast gilia	PDPLM040B3	None	None	G5T2	S2.1	1B.1
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S2	FP
Helianthella castanea Diablo helianthella	PDAST4M020	None	None	G2	S2	1B.2
Helminthoglypta nickliniana bridgesi Bridges' coast range shoulderband	IMGASC2362	None	None	G2T1	S1	
Hemizonia congesta ssp. congesta white seaside tarplant	PDAST4R065	None	None	G5T2T3	S2S3	1B.2
Hoita strobilina Loma Prieta hoita	PDFAB5Z030	None	None	G2	S2	1B.1
Holocarpha macradenia Santa Cruz tarplant	PDAST4X020	Threatened	Endangered	G1	S1	1B.1

Selected Elements by Scientific Name

California Department of Fish and Game

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Horkelia cuneata var. sericea Kellogg's horkelia	PDROS0W043	None	None	G4T2	S2?	1B.1
Hydroprogne caspia Caspian tern	ABNNM08020	None	None	G5	S4	
Isocoma arguta Carquinez goldenbush	PDAST57050	None	None	G1	S1	1B.1
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G5	S3S4	
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4?	
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G4T1	S1	FP
Layia carnosa beach layia	PDAST5N010	Endangered	Endangered	G2	S2	1B.1
Leptosiphon rosaceus rose leptosiphon	PDPLM09180	None	None	G1	S1	1B.1
Masticophis lateralis euryxanthus Alameda whipsnake	ARADB21031	Threatened	Threatened	G4T2	S2	
Meconella oregana Oregon meconella	PDPAP0G030	None	None	G2G3	S1	1B.1
Melospiza melodia maxillaris Suisun song sparrow	ABPBXA301K	None	None	G5T2	S2	SSC
Melospiza melodia pusillula Alameda song sparrow	ABPBXA301S	None	None	G5T2?	S2?	SSC
Melospiza melodia samuelis San Pablo song sparrow	ABPBXA301W	None	None	G5T2?	S2?	SSC
Microcina leei Lee's micro-blind harvestman	ILARA47040	None	None	G1	S1	
Microtus californicus sanpabloensis San Pablo vole	AMAFF11034	None	None	G5T1T2	S1S2	SSC
Monolopia gracilens woodland woollythreads	PDAST6G010	None	None	G2G3	S2S3	1B.2
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Northern Maritime Chaparral Northern Maritime Chaparral	CTT37C10CA	None	None	G1	S1.2	
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S3	
Nyctinomops macrotis big free-tailed bat	AMACD04020	None	None	G5	S2	SSC
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S3	WL

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFG SSC or FP
Plagiobothrys chorisianus var. chorisianus Choris' popcornflower	PDBOR0V061	None	None	G3T2Q	S2.2	1B.2
Plagiobothrys diffusus San Francisco popcornflower	PDBOR0V080	None	Endangered	G1Q	S1	1B.1
Rallus longirostris obsoletus California clapper rail	ABNME05016	Endangered	Endangered	G5T1	S1	FP
Rana boylii foothill yellow-legged frog	AAABH01050	None	None	G3	S2S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G4T2T3	S2S3	SSC
Reithrodontomys raviventris salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP
Sanicula maritima adobe sanicle	PDAPI1Z0D0	None	Rare	G2	S2.2	1B.1
Scapanus latimanus parvus Alameda Island mole	AMABB02031	None	None	G5T1Q	S1	SSC
Serpentine Bunchgrass Serpentine Bunchgrass	CTT42130CA	None	None	G2	S2.2	
Sorex vagrans halicoetes salt-marsh wandering shrew	AMABA01071	None	None	G5T1	S1	SSC
Sternula antillarum browni California least tern	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2S3	FP
Streptanthus albidus ssp. peramoenus most beautiful jewel-flower	PDBRA2G012	None	None	G2T2	S2.2	1B.2
Stuckenia filiformis slender-leaved pondweed	PMPOT03090	None	None	G5	S1S2	2.2
Suaeda californica California seablite	PDCHE0P020	Endangered	None	G1	S1	1B.1
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Trachusa gummifera San Francisco Bay Area leaf-cutter bee	IIHYM80010	None	None	G1	S1	
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2G3	S2S3	
Valley Needlegrass Grassland Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G5	S2.3	2.3
Xanthocephalus xanthocephalus yellow-headed blackbird	ABPBXB3010	None	None	G5	S3S4	SSC

Record Count: 84

CNPS Inventory of Rare and Endangered Plants

Status: Plant Press Manager window with 34 items - Fri, Jan. 11, 2013 20:11 c

Reformat list as: Standard List - with Plant Press controls

ECOLOGICAL REPORT

scientific	family	life form	blooming	communities	elevation	CNPS
Amsinckia lunaris	Boraginaceae	annual herb	Mar-Jun	•Coastal bluff scrub (CBScr) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)	3 - 500 meters	List 1B.2
Arctostaphylos pallida	Ericaceae	perennial evergreen shrub	Dec-Mar	•Broadleafed upland forest (BUFrs) •Closed-cone coniferous forest (CCFrs) •Chaparral (Chprl) •Cismontane woodland (CmWld) •Coastal scrub (CoScr)/siliceous shale, sandy or gravelly	185 - 465 meters	List 1B.1
Astragalus tener var. tener	Fabaceae	annual herb	Mar-Jun	•Playas (Plyas) •Valley and foothill grassland (VFGrs)(adobe clay) •Vernal pools (VnPls)/alkaline	1 - 60 meters	List 1B.2
Atriplex joaquinana	Chenopodiaceae	annual herb	Apr-Oct	•Chenopod scrub (ChScr) •Meadows and seeps (Medws) •Playas (Plyas) •Valley and foothill grassland (VFGrs)/alkaline	1 - 835 meters	List 1B.2
Balsamorhiza macrolepis	Asteraceae	perennial herb	Mar-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/sometimes serpentinite	90 - 1555 meters	List 1B.2
California macrophylla	Geraniaceae	annual herb	Mar-May	•Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/clay	15 - 1200 meters	List 1B.1
Calochortus pulchellus	Liliaceae	perennial bulbiferous herb	Apr-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Riparian woodland (RpWld) •Valley and foothill	30 - 840 meters	List 1B.2

				grassland (VFGrs)		
Calystegia purpurata ssp. saxicola	Convolvulaceae	perennial herb	Apr-Sep	•Coastal bluff scrub (CBScr) •Coastal dunes (CoDns) •Coastal scrub (CoScr) •North Coast coniferous forest (NCFrs)	10 - 105 meters	List 1B.2
Chloropyron maritimum ssp. palustre	Orobanchaceae	annual herb hemiparasitic	Jun-Oct	•Marshes and swamps (MshSw)(coastal salt)	0 - 10 meters	List 1B.2
Chorizanthe cuspidata var. cuspidata	Polygonaceae	annual herb	Apr-Jul(Aug), Months in parentheses are uncommon.	•Coastal bluff scrub (CBScr) •Coastal dunes (CoDns) •Coastal prairie (CoPrr) •Coastal scrub (CoScr)/sandy	3 - 215 meters	List 1B.2
Chorizanthe robusta var. robusta	Polygonaceae	annual herb	Apr-Sep	•Chaparral (Chprl)(maritime) •Cismontane woodland (CmWld)(openings) •Coastal dunes (CoDns) •Coastal scrub (CoScr)/sandy or gravelly	3 - 300 meters	List 1B.1
Cirsium andrewsii	Asteraceae	perennial herb	Mar-Jul	•Broadleafed upland forest (BUFrs) •Coastal bluff scrub (CBScr) •Coastal prairie (CoPrr) •Coastal scrub (CoScr)/mesic, sometimes serpentinite	0 - 150 meters	List 1B.2
Clarkia franciscana	Onagraceae	annual herb	May-Jul	•Coastal scrub (CoScr) •Valley and foothill grassland (VFGrs)(serpentinite)	25 - 335 meters	List 1B.1
Dirca occidentalis	Thymelaeaceae	perennial deciduous shrub	Jan-Mar(Apr), Months in parentheses are uncommon.	•Broadleafed upland forest (BUFrs) •Closed-cone coniferous forest (CCFrs) •Chaparral (Chprl) •Cismontane woodland (CmWld) •North Coast coniferous forest (NCFrs) •Riparian forest	25 - 425 meters	List 1B.2

				(RpFrs) •Riparian woodland (RpWld)/mesic		
Eriogonum luteolum var. caninum	Polygonaceae	annual herb	May-Sep	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Coastal prairie (CoPrr) •Valley and foothill grassland (VFGrs)/serpentinite, sandy to gravelly	0 - 700 meters	List 1B.2
Fritillaria liliacea	Liliaceae	perennial bulbiferous herb	Feb-Apr	•Cismontane woodland (CmWld) •Coastal prairie (CoPrr) •Coastal scrub (CoScr) •Valley and foothill grassland (VFGrs)/Often serpentinite	3 - 410 meters	List 1B.2
Gilia capitata ssp. chamissonis	Polemoniaceae	annual herb	Apr-Jul	•Coastal dunes (CoDns) •Coastal scrub (CoScr)	2 - 200 meters	List 1B.1
Helianthella castanea	Asteraceae	perennial herb	Mar-Jun	•Broadleafed upland forest (BUFrs) •Chaparral (Chprl) •Cismontane woodland (CmWld) •Coastal scrub (CoScr) •Riparian woodland (RpWld) •Valley and foothill grassland (VFGrs)	60 - 1300 meters	List 1B.2
Hoita strobilina	Fabaceae	perennial herb	May-Jul(Aug),(Oct), Months in parentheses are uncommon.	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Riparian woodland (RpWld)/usually serpentinite, mesic	30 - 860 meters	List 1B.1
Holocarpha macradenia	Asteraceae	annual herb	Jun-Oct	•Coastal prairie (CoPrr) •Coastal scrub (CoScr) •Valley and foothill grassland (VFGrs)/often clay, sandy	10 - 220 meters	List 1B.1
Horkelia cuneata var. sericea	Rosaceae	perennial herb	Apr-Sep	•Closed-cone coniferous forest (CCFrs) •Chaparral (Chprl)(maritime) •Coastal dunes (CoDns) •Coastal scrub	10 - 200 meters	List 1B.1

				(CoScr)/sandy or gravelly, openings		
Lathyrus jepsonii var. jepsonii	Fabaceae	perennial herb	May-Jul(Sep), Months in parentheses are uncommon.	•Marshes and swamps (MshSw)(freshwater and brackish)	0 - 4 meters	List 1B.2
Meconella oregana	Papaveraceae	annual herb	Mar-Apr	•Coastal prairie (CoPrr) •Coastal scrub (CoScr)	250 - 620 meters	List 1B.1
Micropus amphibolus	Asteraceae	annual herb	Mar-May	•Broadleafed upland forest (BUFrs) •Chaparral (Chprl) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/rocky	45 - 825 meters	List 3.2
Monardella antonina ssp. antonina	Lamiaceae	perennial rhizomatous herb	Jun-Aug	•Chaparral (Chprl) •Cismontane woodland (CmWld)	500 - 1000 meters	List 3
Monolopia gracilens	Asteraceae	annual herb	(Feb),Mar-Jul Months in parentheses are uncommon.	•Broadleafed upland forest (BUFrs)(openings) •Chaparral (Chprl)(openings) •Cismontane woodland (CmWld) •North Coast coniferous forest (NCFrs)(openings) •Valley and foothill grassland (VFGrs)/Serpentine	100 - 1200 meters	List 1B.2
Plagiobothrys chorisianus var. chorisianus	Boraginaceae	annual herb	Mar-Jun	•Chaparral (Chprl) •Coastal prairie (CoPrr) •Coastal scrub (CoScr)/mesic	15 - 160 meters	List 1B.2
Plagiobothrys diffusus	Boraginaceae	annual herb	Mar-Jun	•Coastal prairie (CoPrr) •Valley and foothill grassland (VFGrs)	60 - 360 meters	List 1B.1
Sanicula maritima	Apiaceae	perennial herb	Feb-May	•Chaparral (Chprl) •Coastal prairie (CoPrr) •Meadows and seeps (Medws) •Valley and foothill grassland (VFGrs)/clay, serpentinite	30 - 240 meters	List 1B.1
Streptanthus albidus ssp. peramoenus	Brassicaceae	annual herb	(Mar),Apr-Sep(Oct), Months in parentheses are uncommon.	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Valley and foothill grassland (VFGrs)/serpentinite	94 - 1000 meters	List 1B.2
				•Marshes and		

Stuckenia filiformis	Potamogetonaceae	perennial rhizomatous herb aquatic	May-Jul	swamps (MshSw)(assorted shallow freshwater)	300 - 2150 meters	List 2.2
Suaeda californica	Chenopodiaceae	perennial evergreen shrub	Jul-Oct	•Marshes and swamps (MshSw)(coastal salt)	0 - 15 meters	List 1B.1
Trifolium hydrophilum	Fabaceae	annual herb	Apr-Jun	•Marshes and swamps (MshSw) •Valley and foothill grassland (VFGrs)(mesic, alkaline) •Vernal pools (VnPls)	0 - 300 meters	List 1B.2
Viburnum ellipticum	Adoxaceae	perennial deciduous shrub	May-Jun	•Chaparral (Chprl) •Cismontane woodland (CmWld) •Lower montane coniferous forest (LCFrs)	215 - 1400 meters	List 2.3

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Amphibians	California tiger Salamander	U.S.A. (CA - Sonoma County)	Endangered	Sacramento Fish And Wildlife		
Amphibians	California red-legged frog (Rana	Entire	Threatened	Sacramento Fish And Wildlife	Recovery Plan for the California	Final
Birds	Western snowy plover	Pacific coastal pop.	Threatened	Arcata Fish And Wildlife Office	Final Recovery Plan for the	Final
Crustaceans	Conservancy fairy shrimp		Endangered	Sacramento Fish And Wildlife	Recovery Plan for Vernal Pool	Final
Crustaceans	Longhorn fairy shrimp		Endangered	Sacramento Fish And Wildlife	Recovery Plan for Vernal Pool	Final
Crustaceans	Vernal pool tadpole shrimp		Endangered	Sacramento Fish And Wildlife	Recovery Plan for Vernal Pool	Final
Fishes	Delta smelt (Hypomesus		Threatened	San Francisco Bay - Delta Fish	Recovery Plan for the	Final
Flowering Plants	Pallid manzanita		Threatened	Sacramento Fish And Wildlife	Draft Recovery Plan for	Draft
Flowering Plants	Presidio clarkia (Clarkia		Endangered	Sacramento Fish And Wildlife	Recovery Plan for Serpentine	Final
Flowering Plants	Palmate-bracted bird's beak		Endangered	Sacramento Fish And Wildlife	Recovery Plan for Upland	Final
Insects	Mission blue butterfly (Icaricia		Endangered	Sacramento Fish And Wildlife	Recovery Plan for San Bruno	Final
Insects	Callippe silverspot butterfly		Endangered	Sacramento Fish And Wildlife		
Mammals	San Joaquin kit fox (Vulpes	U.S.A(CA)	Endangered	Sacramento Fish And Wildlife	Recovery Plan for Upland	Final
Mammals	Salt marsh harvest mouse	U.S.A.(CA)	Endangered	Sacramento Fish And Wildlife	Draft Recovery Plan for the	Draft
Mammals	Salt marsh harvest mouse	U.S.A.(CA)	Endangered	Sacramento Fish And Wildlife	Salt Marsh Harvest Mouse and	Final
Reptiles	Alameda whipsnake (=striped	Entire	Threatened	Sacramento Fish And Wildlife	Draft Recovery Plan for	Draft
Reptiles	Giant garter snake (Thamnophis	Entire	Threatened	Sacramento Fish And Wildlife	Draft Recovery Plan for the	Draft

APPENDIX E
Greenhouse Gases Technical Background

Shops at Uptown Retail Project BAU

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Bank (with Drive-Through)	3	1000sqft
Quality Restaurant	4.3	1000sqft
Strip Mall	2.7	1000sqft
Supermarket	26	1000sqft

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Utility Company** Pacific Gas & Electric Company

Climate Zone 5 **Precipitation Freq (Days)** 63

1.3 User Entered Comments

Project Characteristics - This Run is Buisness as Usual scenario for GHG only. Assume year 2005 operations to remove pavley & LCFS benefits

Land Use - The total site area is 1.9 acres. The project buildings have a total square footage of 36,000 square feet.

Construction Phase - Adjusted construction phase start and end dates to align with applicant schedule.

Off-road Equipment - Updated Equipment List based on applicant information. Also updated load factors to reflect CARB recommendation (2/3 of CalEEMod defaults).

Off-road Equipment - Updated Equipment List based on applicant information. Also updated load factors to reflect CARB recommendation (2/3 of CalEEMod defaults).

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Off-road Equipment - Updated Equipment List based on applicant information. Also updated load factors to reflect CARB recommendation (2/3 of CalEEMod defaults).

Demolition - No structures on-site.

Grading - Material exported and imported adjusted based on applicant information.

Architectural Coating - VOC levels adjusted to match GBC.

Vehicle Trips - Weekday Trip Rates adjusted based on Fehr & Peers Trip Generation Figures. Non Res C-C Trip Length adjusted to 2.7 miles for supermarket and o.5 for other retail uses based on estimates of the transportation consultant.

Energy Use -

Area Coating - Adjust ROG factor to match upper end of GBC

Water And Wastewater -

Construction Off-road Equipment Mitigation -

Energy Mitigation -

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	1.36	6.65	4.58	0.01	0.14	0.46	0.60	0.00	0.46	0.46	0.00	713.38	713.38	0.08	0.00	714.97
Total	**1.36**	**6.65**	**4.58**	**0.01**	**0.14**	**0.46**	**0.60**	**0.00**	**0.46**	**0.46**	**0.00**	**713.38**	**713.38**	**0.08**	**0.00**	**714.97**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	1.36	6.65	4.58	0.01	0.00	0.46	0.46	0.00	0.46	0.46	0.00	713.38	713.38	0.08	0.00	714.97
Total	**1.36**	**6.65**	**4.58**	**0.01**	**0.00**	**0.46**	**0.46**	**0.00**	**0.46**	**0.46**	**0.00**	**713.38**	**713.38**	**0.08**	**0.00**	**714.97**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.17					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.01	0.09	0.08	0.00		0.00	0.01		0.00	0.01	0.00	445.41	445.41	0.02	0.01	448.18
Mobile	3.12	5.54	26.67	0.04	0.93	0.14	1.08	0.04	0.14	0.18	0.00	1,153.62	1,153.62	0.16	0.00	1,156.88
Waste						0.00	0.00		0.00	0.00	31.71	0.00	31.71	1.87	0.00	71.06
Water						0.00	0.00		0.00	0.00	0.00	8.04	8.04	0.15	0.00	12.32
Total	**3.30**	**5.63**	**26.75**	**0.04**	**0.93**	**0.14**	**1.09**	**0.04**	**0.14**	**0.19**	**31.71**	**1,607.07**	**1,638.78**	**2.20**	**0.01**	**1,688.44**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.17					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.01	0.09	0.08	0.00		0.00	0.01		0.00	0.01	0.00	445.41	445.41	0.02	0.01	448.18
Mobile	3.12	5.54	26.67	0.04	0.93	0.14	1.08	0.04	0.14	0.18	0.00	1,153.62	1,153.62	0.16	0.00	1,156.88
Waste						0.00	0.00		0.00	0.00	31.71	0.00	31.71	1.87	0.00	71.06
Water						0.00	0.00		0.00	0.00	0.00	8.04	8.04	0.15	0.00	12.32
Total	**3.30**	**5.63**	**26.75**	**0.04**	**0.93**	**0.14**	**1.09**	**0.04**	**0.14**	**0.19**	**31.71**	**1,607.07**	**1,638.78**	**2.20**	**0.01**	**1,688.44**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

3.2 Demolition - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.00	0.02	0.02	0.00		0.00	0.00		0.00	0.00	0.00	2.76	2.76	0.00	0.00	2.77
Total	**0.00**	**0.02**	**0.02**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**2.76**	**2.76**	**0.00**	**0.00**	**2.77**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.00	0.00	0.23
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.23**	**0.23**	**0.00**	**0.00**	**0.23**

3.2 Demolition - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.00	0.02	0.02	0.00		0.00	0.00		0.00	0.00	0.00	2.76	2.76	0.00	0.00	2.77
Total	**0.00**	**0.02**	**0.02**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**2.76**	**2.76**	**0.00**	**0.00**	**2.77**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.00	0.00	0.23
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.23**	**0.23**	**0.00**	**0.00**	**0.23**

3.3 Site Preparation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.00	0.03	0.02	0.00		0.00	0.00		0.00	0.00	0.00	3.32	3.32	0.00	0.00	3.33
Total	**0.00**	**0.03**	**0.02**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**3.32**	**3.32**	**0.00**	**0.00**	**3.33**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.00	0.00	0.23
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.23**	**0.23**	**0.00**	**0.00**	**0.23**

3.3 Site Preparation - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.00	0.03	0.02	0.00		0.00	0.00		0.00	0.00	0.00	3.32	3.32	0.00	0.00	3.33
Total	**0.00**	**0.03**	**0.02**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**3.32**	**3.32**	**0.00**	**0.00**	**3.33**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.00	0.00	0.23
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.23**	**0.23**	**0.00**	**0.00**	**0.23**

3.4 Grading - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.05	0.33	0.24	0.00		0.02	0.02		0.02	0.02	0.00	34.24	34.24	0.00	0.00	34.32
Total	**0.05**	**0.33**	**0.24**	**0.00**	**0.00**	**0.02**	**0.02**	**0.00**	**0.02**	**0.02**	**0.00**	**34.24**	**34.24**	**0.00**	**0.00**	**34.32**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.01	0.15	0.07	0.00	0.12	0.01	0.12	0.00	0.01	0.01	0.00	23.48	23.48	0.00	0.00	23.49
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44	2.44	0.00	0.00	2.45
Total	**0.01**	**0.15**	**0.09**	**0.00**	**0.12**	**0.01**	**0.12**	**0.00**	**0.01**	**0.01**	**0.00**	**25.92**	**25.92**	**0.00**	**0.00**	**25.94**

3.4 Grading - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.05	0.33	0.24	0.00		0.02	0.02		0.02	0.02	0.00	34.24	34.24	0.00	0.00	34.32
Total	**0.05**	**0.33**	**0.24**	**0.00**	**0.00**	**0.02**	**0.02**	**0.00**	**0.02**	**0.02**	**0.00**	**34.24**	**34.24**	**0.00**	**0.00**	**34.32**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.01	0.15	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.00	23.48	23.48	0.00	0.00	23.49
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44	2.44	0.00	0.00	2.45
Total	**0.01**	**0.15**	**0.09**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**25.92**	**25.92**	**0.00**	**0.00**	**25.94**

3.5 Building Construction - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.86	5.98	4.05	0.01		0.42	0.42		0.42	0.42	0.00	619.35	619.35	0.07	0.00	620.81
Total	**0.86**	**5.98**	**4.05**	**0.01**		**0.42**	**0.42**		**0.42**	**0.42**	**0.00**	**619.35**	**619.35**	**0.07**	**0.00**	**620.81**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.01	0.08	0.05	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	13.00	13.00	0.00	0.00	13.01
Worker	0.01	0.01	0.07	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	10.26	10.26	0.00	0.00	10.28
Total	**0.02**	**0.09**	**0.12**	**0.00**	**0.01**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**23.26**	**23.26**	**0.00**	**0.00**	**23.29**

3.5 Building Construction - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.86	5.98	4.05	0.01		0.42	0.42		0.42	0.42	0.00	619.35	619.35	0.07	0.00	620.81
Total	**0.86**	**5.98**	**4.05**	**0.01**		**0.42**	**0.42**		**0.42**	**0.42**	**0.00**	**619.35**	**619.35**	**0.07**	**0.00**	**620.81**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.01	0.08	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.00	13.00	0.00	0.00	13.01
Worker	0.01	0.01	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.26	10.26	0.00	0.00	10.28
Total	**0.02**	**0.09**	**0.12**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**23.26**	**23.26**	**0.00**	**0.00**	**23.29**

3.6 Paving - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.01	0.03	0.02	0.00		0.00	0.00		0.00	0.00	0.00	3.07	3.07	0.00	0.00	3.08
Paving	0.00					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.01**	**0.03**	**0.02**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**3.07**	**3.07**	**0.00**	**0.00**	**3.08**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.00	0.00	0.29
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.29**	**0.29**	**0.00**	**0.00**	**0.29**

3.6 Paving - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.01	0.03	0.02	0.00		0.00	0.00		0.00	0.00	0.00	3.07	3.07	0.00	0.00	3.08
Paving	0.00					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.01**	**0.03**	**0.02**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**3.07**	**3.07**	**0.00**	**0.00**	**3.08**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.00	0.00	0.29
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.29**	**0.29**	**0.00**	**0.00**	**0.29**

3.7 Architectural Coating - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.42					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.00	0.01	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.64	0.64	0.00	0.00	0.64
Total	**0.42**	**0.01**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.64**	**0.64**	**0.00**	**0.00**	**0.64**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.05
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.05**	**0.05**	**0.00**	**0.00**	**0.05**

3.7 Architectural Coating - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.42					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.00	0.01	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.64	0.64	0.00	0.00	0.64
Total	**0.42**	**0.01**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.64**	**0.64**	**0.00**	**0.00**	**0.64**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.05
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.05**	**0.05**	**0.00**	**0.00**	**0.05**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.12	5.54	26.67	0.04	0.93	0.14	1.08	0.04	0.14	0.18	0.00	1,153.62	1,153.62	0.16	0.00	1,156.88
Unmitigated	3.12	5.54	26.67	0.04	0.93	0.14	1.08	0.04	0.14	0.18	0.00	1,153.62	1,153.62	0.16	0.00	1,156.88
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Bank (with Drive-Through)	368.55	368.55	368.55	113,534	113,534
Quality Restaurant	321.25	321.25	321.25	147,877	147,877
Strip Mall	95.45	95.45	95.45	63,310	63,310
Supermarket	2,599.74	2,599.74	2599.74	1,611,217	1,611,217
Total	3,384.99	3,384.99	3,384.99	1,935,939	1,935,939

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
Bank (with Drive-Through)	9.50	0.50	7.30	6.60	74.40	19.00

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
Quality Restaurant	9.50	0.50	7.30	12.00	69.00	19.00
Strip Mall	9.50	0.50	7.30	16.60	64.40	19.00
Supermarket	9.50	2.70	7.30	6.50	74.50	19.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.00	0.00		0.00	0.00	0.00	348.17	348.17	0.02	0.01	350.35
Electricity Unmitigated						0.00	0.00		0.00	0.00	0.00	348.17	348.17	0.02	0.01	350.35
NaturalGas Mitigated	0.01	0.09	0.08	0.00		0.00	0.01		0.00	0.01	0.00	97.25	97.25	0.00	0.00	97.84
NaturalGas Unmitigated	0.01	0.09	0.08	0.00		0.00	0.01		0.00	0.01	0.00	97.25	97.25	0.00	0.00	97.84
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
Bank (with Drive-Through)	77040	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	4.11	4.11	0.00	0.00	4.14
Quality Restaurant	731043	0.00	0.04	0.03	0.00		0.00	0.00		0.00	0.00	0.00	39.01	39.01	0.00	0.00	39.25
Strip Mall	12960	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.69	0.69	0.00	0.00	0.70
Supermarket	1.00126e+006	0.01	0.05	0.04	0.00		0.00	0.00		0.00	0.00	0.00	53.43	53.43	0.00	0.00	53.76
Total		**0.01**	**0.09**	**0.07**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**97.24**	**97.24**	**0.00**	**0.00**	**97.85**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
Bank (with Drive-Through)	77040	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	4.11	4.11	0.00	0.00	4.14
Quality Restaurant	731043	0.00	0.04	0.03	0.00		0.00	0.00		0.00	0.00	0.00	39.01	39.01	0.00	0.00	39.25
Strip Mall	12960	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.69	0.69	0.00	0.00	0.70
Supermarket	1.00126e+006	0.01	0.05	0.04	0.00		0.00	0.00		0.00	0.00	0.00	53.43	53.43	0.00	0.00	53.76
Total		**0.01**	**0.09**	**0.07**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**97.24**	**97.24**	**0.00**	**0.00**	**97.85**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
Bank (with Drive-Through)	24810					7.22	0.00	0.00	7.26
Quality Restaurant	130032					37.83	0.00	0.00	38.06
Strip Mall	31347					9.12	0.00	0.00	9.18
Supermarket	1.01062e+006					294.00	0.01	0.01	295.84
Total						**348.17**	**0.01**	**0.01**	**350.34**

Mitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
Bank (with Drive-Through)	24810					7.22	0.00	0.00	7.26
Quality Restaurant	130032					37.83	0.00	0.00	38.06
Strip Mall	31347					9.12	0.00	0.00	9.18
Supermarket	1.01062e+006					294.00	0.01	0.01	295.84
Total						**348.17**	**0.01**	**0.01**	**350.34**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.17					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	0.17					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.03					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.14					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.17**					**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

6.2 Area by SubCategory

<u>Mitigated</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.03					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.14					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.17**					**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					8.04	0.15	0.00	12.32
Unmitigated					8.04	0.15	0.00	12.32
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
Bank (with Drive-Through)	0.118869 / 0.072855					0.26	0.00	0.00	0.37
Quality Restaurant	1.30519 / 0.0833103					2.15	0.04	0.00	3.31
Strip Mall	0.199996 / 0.122578					0.44	0.01	0.00	0.62
Supermarket	3.20497 / 0.0991229					5.18	0.10	0.00	8.02
Total						**8.03**	**0.15**	**0.00**	**12.32**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
Bank (with Drive-Through)	0.118869 / 0.072855					0.26	0.00	0.00	0.37
Quality Restaurant	1.30519 / 0.0833103					2.15	0.04	0.00	3.31
Strip Mall	0.199996 / 0.122578					0.44	0.01	0.00	0.62
Supermarket	3.20497 / 0.0991229					5.18	0.10	0.00	8.02
Total						**8.03**	**0.15**	**0.00**	**12.32**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
	tons/yr				MT/yr			
Mitigated					31.71	1.87	0.00	71.06
Unmitigated					31.71	1.87	0.00	71.06
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Bank (with Drive-Through)	2.8					0.57	0.03	0.00	1.27
Quality Restaurant	3.92					0.80	0.05	0.00	1.78
Strip Mall	2.84					0.58	0.03	0.00	1.29
Supermarket	146.64					29.77	1.76	0.00	66.71
Total						**31.72**	**1.87**	**0.00**	**71.05**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
Bank (with Drive-Through)	2.8					0.57	0.03	0.00	1.27
Quality Restaurant	3.92					0.80	0.05	0.00	1.78
Strip Mall	2.84					0.58	0.03	0.00	1.29
Supermarket	146.64					29.77	1.76	0.00	66.71
Total						**31.72**	**1.87**	**0.00**	**71.05**

9.0 Vegetation

R-407A Refrigerant Emissions

Equipment Type	Capacity (lbs of R-407A)	lbs of R-407A/year (15% leak rate)	CO_2e (Tonnes/Year)
Refrigeration Unit	740	111	**106.0666667**

1 Tonne =	2,205	lbs
R-407A Global Warming Potential (GWP) =	2,107	

APPENDIX F

Noise Technical Background

Traffic Noise Level Estimates Saturday rev 06/11/13

ROAD SEGMENT	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Auto	Medium Truck %	MT	Heavy Truck %	HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	calveno factors Auto	MT	HT	(15 meters from roadway center)
51st west of Broadway																	
Existing (2012)	1,495	95	1,420	3	45	2	30	30	48	30	48	30	48	63.9	59.5	64.9	68.1
Existing + Project	1,507	95	1,432	3	45	2	30	30	48	30	48	30	48	63.9	59.5	64.9	68.1
Cumulative (2035)	2,008	95	1,908	3	60	2	40	30	48	30	48	30	48	65.2	60.8	66.2	69.4
Cumulative (2035) + Project	2,020	95	1,919	3	61	2	40	30	48	30	48	30	48	65.2	60.8	66.2	69.4
Broadway north of 40th																	
Existing (2012)	1,488	95	1,414	3	45	2	30	30	48	30	48	30	48	63.9	59.5	64.9	68.1
Existing + Project	1,543	95	1,466	3	46	2	31	30	48	30	48	30	48	64.0	59.6	65.0	68.2
Cumulative (2035)	2,755	95	2,617	3	83	2	55	30	48	30	48	30	48	66.6	62.2	67.5	70.7
Cumulative (2035) + Project	2,810	95	2,670	3	84	2	56	30	48	30	48	30	48	66.6	62.2	67.6	70.8
Telegraph south of Macarthur																	
Existing (2012)	1,102	95	1,047	3	33	2	22	30	48	30	48	30	48	62.6	58.2	63.6	66.8
Existing + Project	1,135	95	1,078	3	34	2	23	30	48	30	48	30	48	62.7	58.3	63.7	66.9
Cumulative (2035)	2,407	95	2,287	3	72	2	48	30	48	30	48	30	48	66.0	61.6	67.0	70.1
Cumulative (2035) + Project	2,440	95	2,318	3	73	2	49	30	48	30	48	30	48	66.0	61.6	67.0	70.2
Macarthur East of Telegraph																	
Existing (2012)	787	95	748	3	24	2	16	30	48	30	48	30	48	61.1	56.7	62.1	65.3
Existing + Project	791	95	751	3	24	2	16	30	48	30	48	30	48	61.1	56.7	62.1	65.3
Cumulative (2035)	1,756	95	1,668	3	53	2	35	30	48	30	48	30	48	64.6	60.2	65.6	68.8
Cumulative (2035) + Project	1,760	95	1,672	3	53	2	35	30	48	30	48	30	48	64.6	60.2	65.6	68.8
Broadway south of Macarthur																	
Existing (2012)	946	95	899	3	28	2	19	30	48	30	48	30	48	61.9	57.5	62.9	66.1
Existing + Project	1,010	95	960	3	30	2	20	30	48	30	48	30	48	62.2	57.8	63.2	66.4
Cumulative (2035)	1,976	95	1,877	3	59	2	40	30	48	30	48	30	48	65.1	60.7	66.1	69.3
Cumulative (2035) + Project	2,040	95	1,938	3	61	2	41	30	48	30	48	30	48	65.3	60.9	66.2	69.4
Piedmont south of Macarthur																	
Existing (2012)	477	95	453	3	14	2	10	30	48	30	48	30	48	58.9	54.5	59.9	63.1
Existing + Project	526	95	500	3	16	2	11	30	48	30	48	30	48	59.4	55.0	60.3	63.5
Cumulative (2035)	931	95	884	3	28	2	19	30	48	30	48	30	48	61.8	57.4	62.8	66.0
Cumulative (2035) + Project	980	95	931	3	29	2	20	30	48	30	48	30	48	62.1	57.7	63.1	66.2
Piedmont east of Broadway																	
Existing (2012)	394	95	374	3	12	2	8	30	48	30	48	30	48	58.1	53.7	59.1	62.3
Existing + Project	443	95	421	3	13	2	9	30	48	30	48	30	48	58.6	54.2	59.6	62.8
Cumulative (2035)	851	95	808	3	26	2	17	30	48	30	48	30	48	61.5	57.1	62.4	65.6
Cumulative (2035) + Project	900	95	855	3	27	2	18	30	48	30	48	30	48	61.7	57.3	62.7	65.9
30th west of Broadway																	
Existing (2012)	126	95	120	3	4	2	3	30	48	30	48	30	48	53.2	48.8	54.1	57.3
Existing + Project	294	95	279	3	9	2	6	30	48	30	48	30	48	56.8	52.4	57.8	61.0
Cumulative (2035)	228	95	217	3	7	2	5	30	48	30	48	30	48	55.7	51.3	56.7	59.9
Cumulative (2035) + Project	396	95	376	3	12	2	8	30	48	30	48	30	48	58.1	53.7	59.1	62.3
29th east of Broadway																	
Existing (2012)	333	95	316	3	10	2	7	30	48	30	48	30	48	57.4	53.0	58.4	61.6
Existing + Project	350	95	333	3	11	2	7	30	48	30	48	30	48	57.6	53.2	58.6	61.8
Cumulative (2035)	673	95	639	3	20	2	13	30	48	30	48	30	48	60.4	56.0	61.4	64.6
Cumulative (2035) + Project	690	95	656	3	21	2	14	30	48	30	48	30	48	60.5	56.1	61.5	64.7

27th east of Telegraph																			
Existing (2012)	630		95	599	3	19	2	13		30	48	30	48	30	48	60.2	55.8	61.1	64.3
Existing + Project	645		95	613	3	19	2	13		30	48	30	48	30	48	60.3	55.9	61.2	64.4
Cumulative (2035)	1,265		95	1,202	3	38	2	25		30	48	30	48	30	48	63.2	58.8	64.2	67.4
Cumulative (2035) + Project	1,280		95	1,216	3	38	2	26		30	48	30	48	30	48	63.2	58.8	64.2	67.4
27th east of Broadway																			
Existing (2012)	674		95	640	3	20	2	13		30	48	30	48	30	48	60.4	56.0	61.4	64.6
Existing + Project	720		95	684	3	22	2	14		30	48	30	48	30	48	60.7	56.3	61.7	64.9
Cumulative (2035)	1,434		95	1,362	3	43	2	29		30	48	30	48	30	48	63.7	59.3	64.7	67.9
Cumulative (2035) + Project	1,480		95	1,406	3	44	2	30		30	48	30	48	30	48	63.9	59.5	64.8	68.0
Broadway south of Grand																			
Existing (2012)	940		95	893	3	28	2	19		30	48	30	48	30	48	61.9	57.5	62.9	66.1
Existing + Project	968		95	920	3	29	2	19		30	48	30	48	30	48	62.0	57.6	63.0	66.2
Cumulative (2035)	1,882		95	1,788	3	56	2	38		30	48	30	48	30	48	64.9	60.5	65.9	69.1
Cumulative (2035) + Project	1,910		95	1,815	3	57	2	38		30	48	30	48	30	48	65.0	60.6	65.9	69.1

Chiron Project Roadway Noise Analysis

Existing

ROAD SEGMENT	from:	to:	TOTAL # VEHICLES	VEHICLE TYPE % Auto %	Auto	MT %	MT	HT %	HT	VEHICLE SPEED Auto	k/h	MT	k/h	HT	k/h	NOISE LEVEL (dBA) Auto	MT	HT	CALCULATED NOISE LEVEL (15 meters from roadway center)	Receptor Dist. from Roadway Center (m.)	Adjusted Noise Level (dBA)	Distance from Roadway to 65 dBA (m.)	Distance from Roadway to 65 dBA (ft)
Calveno Peak Ramp			274	99	271.26	1	2.466	0.1	0.274	15	24	15	24	15	24	48.0	42.2	41.7	49.8	15	49.8	0.5	1.5

APPENDIX G

Transportation and Circulation Technical Background

FEHR & PEERS

TECHNICAL TRANSPORTATION APPENDIX

SHOPS AT BROADWAY DEIR

June 2013

WC12-2948

Appendix B1: Existing Count Validation Memorandum

Appendix B2: Intersection Count Data Sheets

Appendix B3: LOS Calculation Worksheets – Existing Conditions

Appendix B4: LOS Calculation Worksheets – Existing Plus Project Conditions

Appendix B5: LOS Calculation Worksheets – 2035 No Project Conditions

Appendix B6: LOS Calculation Worksheets – 2035 Plus Project Conditions

Appendix B7: CMP Analysis Calculations

Appendix B8: Queue Calculation Worksheets

FEHR PEERS

Appendix B1

Existing Count Validation Memorandum

FEHR & PEERS

FEHR PEERS

MEMORANDUM

Date: June 26, 2012

To: Laura Kaminski, City of Oakland

From: Sam Tabibnia

Subject: Broadway/Valdez District Specific Plan and EIR – Existing Counts

WC09-2618

Traffic counts at most study intersections that would potentially be analyzed for the project EIR were collected in 2007 through 2009 and used for previously published environmental documents. These counts are currently between three and five years old. To assess their suitability for use in the Broadway/Valdez District Specific Plan EIR, we conducted new counts at three intersections as "indicators," to determine if overall traffic volumes in the study area have increased since 2007/2009.

In consultation with City of Oakland Transportation Service Division, the following three intersections were selected as "indicator" intersections:

- Telegraph Avenue/MacArthur Boulevard
- Telegraph Avenue/27th Street
- Broadway/Grand Avenue

We collected vehicle turning movement counts, as well as bicycle and pedestrian counts, at these three intersections during AM and PM peak periods (7:00 to 9:00 AM and 4:00 to 6:00 PM) on June 5, 2012, while local schools were in normal session.

Table 1 compares the total intersection traffic volumes during both AM and PM peak hours with previous volumes collected in 2008. Overall, the 2008 intersection volumes were higher than the more recent 2012 volumes during both peak hours except at the following intersections:

- Telegraph Avenue/27th Street intersection - 2012 AM peak hour intersection volume is about one percent higher than 20008.
- Telegraph Avenue/MacArthur Boulevard - 2012 PM peak hour intersection volume is about nine percent higher than 20008.

TABLE 1
TRAFFIC VOLUME COMPARISON

Intersection	AM Peak Hour			PM Peak Hour		
	2008 Intersection Volume[1]	2012 Intersection Volume[2]	Percent Change	2008 Intersection Volume[1]	2012 Intersection Volume[2]	Percent Change
Telegraph Avenue/ MacArthur Boulevard	1,751	1,668	-5%	2,613	2,845	+9%
Telegraph Avenue/ 27th Street	1,930	1,953	+1%	2,872	2,574	-10%
Broadway/ Grand Avenue	2,204	1,997	-9%	2,777	2,589	-7%

1. Total intersection volume based on data collected in November 2008 for the *ABSMC Summit Campus Seismic Upgrade and Master Plan Project Draft EIR*.
2. Total intersection volume based on data collected in June 2012.

Source: Fehr & Peers, 2012.

In general, the 2012 intersection volumes are within ten percent of the 2008 volumes, which is within the typical fluctuation expected in day-to-day traffic volumes. Thus, the 2008 counts continue to represent existing traffic conditions in the area. Considering that two of the three "indicator" intersections had higher traffic volumes in 2008, it is expected that using the previous data throughout the study area would result in a more conservative analysis of existing conditions for the environmental document. In addition, since the 2020 and 2035 future traffic volume forecasts would also be based on existing traffic volumes, using the higher previous volumes would result in a more conservative analysis of future conditions.

The 2007-2009 count data would be valid for use in the Broadway-Valdez Specific Plan EIR because the previous data continues to represent existing conditions and would result in a more conservative analysis.

Please contact us with questions or comments.

Appendix B2

Intersection Count Data Sheets

FEHR & PEERS

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-038 BROADWAY-51ST-F
Site Code : 00000000
Start Date : 11/11/2008
Page No : 1

Groups Printed- Unshifted

	BROADWAY Southbound					PLEASANT VALLEY AVE Westbound					BROADWAY Northbound					51ST ST. Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	40	59	9	1	108	3	34	40	2	77	6	25	5	1	36	10	22	4	1	36	5	257	262
07:15	55	58	10	1	123	9	51	33	2	93	12	28	7	2	47	10	33	4	2	47	7	310	317
07:30	62	90	12	1	164	7	66	61	2	134	17	39	11	0	67	29	39	9	0	77	3	442	445
07:45	52	92	23	2	167	15	77	64	5	156	17	65	11	2	93	32	37	8	3	77	12	493	505
Total	209	299	54	5	562	34	228	198	11	460	52	157	34	5	243	81	131	25	6	237	27	1502	1529
08:00	83	105	27	2	215	24	83	79	3	186	18	60	11	3	89	22	43	23	5	88	13	578	591
08:15	97	110	29	4	236	11	87	50	2	148	25	57	17	0	99	22	48	16	2	86	8	569	577
08:30	82	114	20	2	216	19	90	68	5	177	23	69	26	1	118	24	52	12	2	88	10	599	609
08:45	93	106	31	4	230	28	93	67	10	188	19	54	23	2	96	38	81	15	2	134	18	648	666
Total	355	435	107	12	897	82	353	264	20	699	85	240	77	6	402	106	224	66	11	396	49	2394	2443
*** BREAK ***																							
16:00	99	62	6	10	167	49	92	57	18	198	39	125	34	0	198	40	121	25	0	186	28	749	777
16:15	132	80	16	3	228	19	98	95	1	212	24	141	41	1	206	41	119	23	1	183	6	829	835
16:30	130	71	19	7	220	23	99	89	7	211	28	160	48	4	236	43	129	14	2	186	20	853	873
16:45	125	50	13	0	188	33	105	72	7	210	40	195	26	3	261	45	124	17	1	186	11	845	856
Total	486	263	54	20	803	124	394	313	33	831	131	621	149	8	901	169	493	79	4	741	65	3276	3341
17:00	136	66	14	4	216	31	106	92	23	229	35	182	23	9	240	48	118	19	1	185	37	870	907
17:15	140	68	16	4	224	35	118	88	17	241	30	179	27	2	236	40	147	11	0	198	23	899	922
17:30	151	64	22	7	237	37	127	100	17	264	30	194	19	2	243	38	130	21	0	189	26	933	959
17:45	155	68	14	7	237	24	115	91	11	230	25	163	34	1	222	49	139	11	1	199	20	888	908
Total	582	266	66	22	914	127	466	371	68	964	120	718	103	14	941	175	534	62	2	771	106	3590	3696
Grand Total	1632	1263	281	59	3176	367	1441	1146	132	2954	388	1736	363	33	2487	531	1382	232	23	2145	247	10762	11009
Apprch %	51.4	39.8	8.8			12.4	48.8	38.8			15.6	69.8	14.6			24.8	64.4	10.8					
Total %	15.2	11.7	2.6		29.5	3.4	13.4	10.6		27.4	3.6	16.1	3.4		23.1	4.9	12.8	2.2		19.9	2.2	97.8	

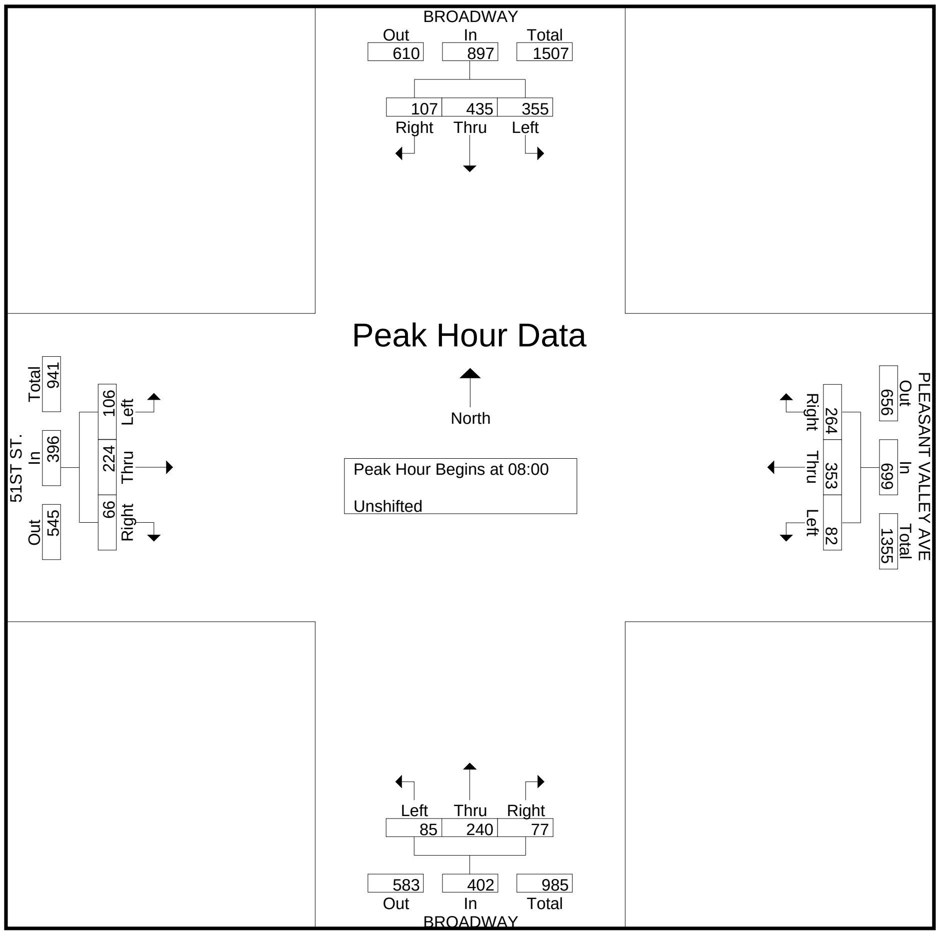
	BROADWAY Southbound				PLEASANT VALLEY AVE Westbound				BROADWAY Northbound				51ST ST. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	83	105	27	215	24	83	**79**	186	18	60	11	89	22	43	**23**	88	578
08:15	**97**	110	29	**236**	11	87	50	148	**25**	57	17	99	22	48	16	86	569
08:30	82	**114**	20	216	19	90	68	177	23	**69**	**26**	**118**	24	52	12	88	599
08:45	93	106	**31**	230	**28**	**93**	67	**188**	19	54	23	96	**38**	**81**	15	**134**	**648**
Total Volume	355	435	107	897	82	353	264	699	85	240	77	402	106	224	66	396	2394
% App. Total	39.6	48.5	11.9		11.7	50.5	37.8		21.1	59.7	19.2		26.8	56.6	16.7		
PHF	.915	.954	.863	.950	.732	.949	.835	.930	.850	.870	.740	.852	.697	.691	.717	.739	.924

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-038 BROADWAY-51ST-F
Site Code : 00000000
Start Date : 11/11/2008
Page No : 2



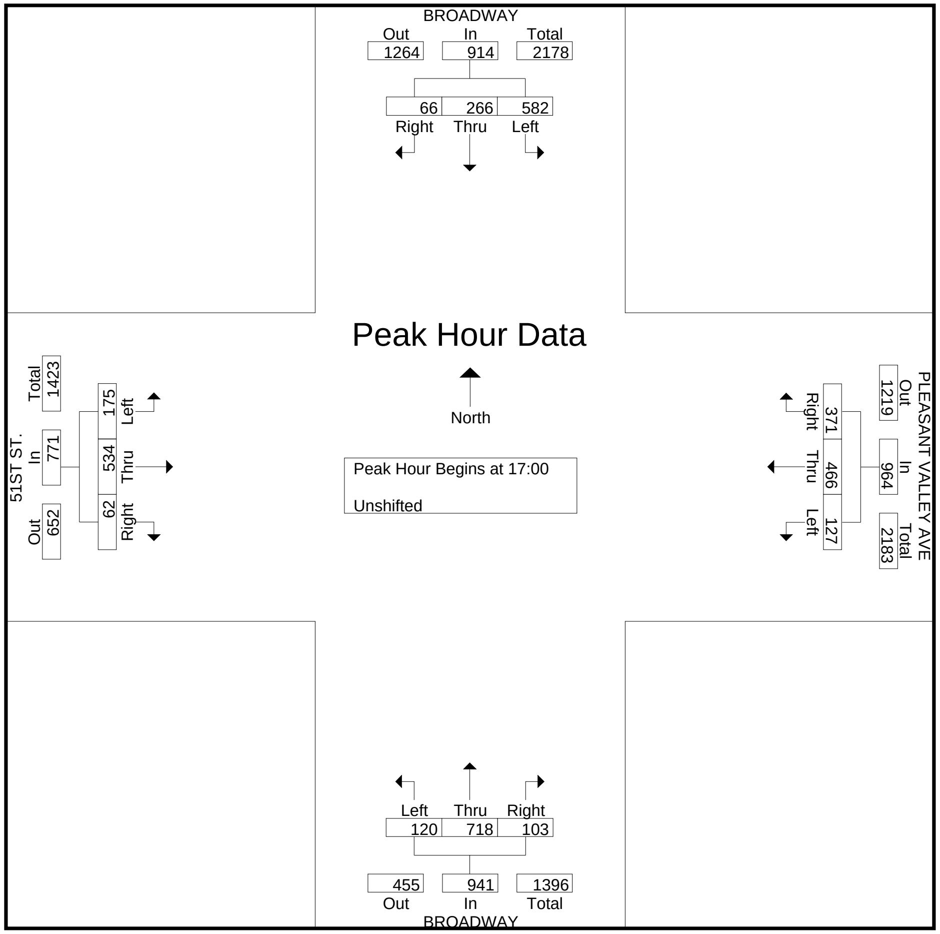
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	136	66	14	216	31	106	92	229	**35**	182	23	240	48	118	19	185	870
17:15	140	**68**	16	224	35	118	88	241	30	179	27	236	40	**147**	11	198	899
17:30	151	64	**22**	**237**	**37**	**127**	**100**	**264**	30	**194**	19	**243**	38	130	**21**	189	**933**
17:45	**155**	68	14	237	24	115	91	230	25	163	**34**	222	**49**	139	11	**199**	888
Total Volume	582	266	66	914	127	466	371	964	120	718	103	941	175	534	62	771	3590
% App. Total	63.7	29.1	7.2		13.2	48.3	38.5		12.8	76.3	10.9		22.7	69.3	8		
PHF	.939	.978	.750	.964	.858	.917	.928	.913	.857	.925	.757	.968	.893	.908	.738	.969	.962

All Traffic Data
(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-038 BROADWAY-51ST-F
Site Code : 00000000
Start Date : 11/11/2008
Page No : 3



MARKS TRAFFIC DATA

CITY OF OAKLAND

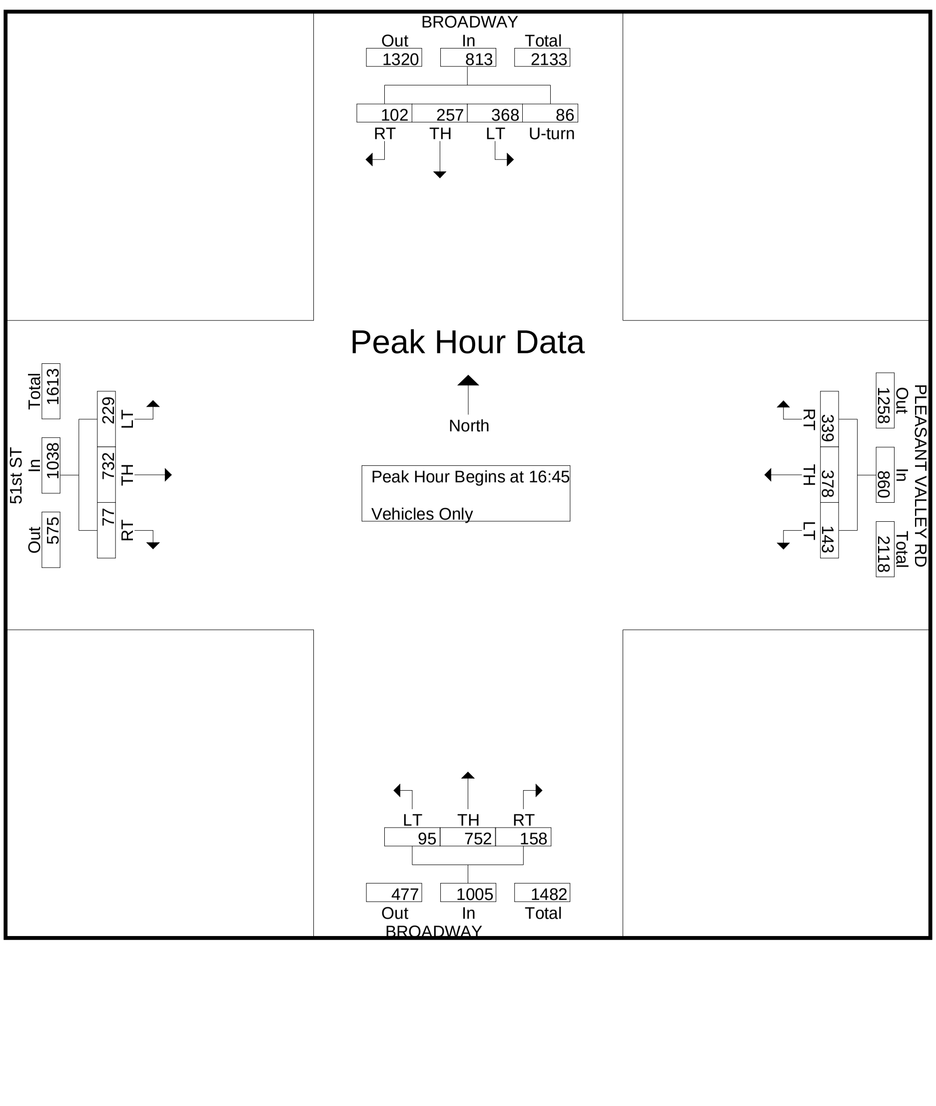
fp
Mietek 916-806-0250

File Name : broadway-51-p
Site Code : 7
Start Date : 5/12/2010
Page No : 1

Groups Printed- Vehicles Only

	BROADWAY Southbound					PLEASANT VALLEY RD Westbound				BROADWAY Northbound				51st ST Eastbound				
Start Time	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	20	69	74	13	176	74	76	22	172	36	196	24	256	14	102	34	150	754
16:15	18	64	77	17	176	82	72	24	178	42	184	27	253	16	112	36	164	771
16:30	21	72	96	22	211	88	78	28	194	35	167	23	225	15	84	49	148	778
16:45	21	62	97	24	204	73	93	39	205	38	186	18	242	18	134	48	200	851
Total	80	267	344	76	767	317	319	113	749	151	733	92	976	63	432	167	662	3154
17:00	33	54	91	23	201	109	83	35	227	43	175	31	249	16	176	59	251	928
17:15	25	61	106	19	211	80	94	32	206	41	204	23	268	21	199	58	278	963
17:30	23	80	74	20	197	77	108	37	222	36	187	23	246	22	223	64	309	974
17:45	22	64	139	8	233	82	82	40	204	39	233	27	299	20	118	64	202	938
Total	103	259	410	70	842	348	367	144	859	159	799	104	1062	79	716	245	1040	3803
Grand Total	183	526	754	146	1609	665	686	257	1608	310	1532	196	2038	142	1148	412	1702	6957
Apprch %	11.4	32.7	46.9	9.1		41.4	42.7	16		15.2	75.2	9.6		8.3	67.5	24.2		
Total %	2.6	7.6	10.8	2.1	23.1	9.6	9.9	3.7	23.1	4.5	22	2.8	29.3	2	16.5	5.9	24.5	

	BROADWAY Southbound					PLEASANT VALLEY RD Westbound				BROADWAY Northbound				51st ST Eastbound				
Start Time	RT	TH	LT	U-turn	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:30 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 16:45																		
16:45	21	62	97	**24**	204	73	93	**39**	205	38	186	18	242	18	134	48	200	851
17:00	**33**	54	91	23	201	**109**	83	35	**227**	**43**	175	**31**	249	16	176	59	251	928
17:15	25	61	**106**	19	**211**	80	94	32	206	41	**204**	23	**268**	21	199	58	278	963
17:30	23	**80**	74	20	197	77	**108**	37	222	36	187	23	246	**22**	**223**	**64**	**309**	**974**
Total Volume	102	257	368	86	813	339	378	143	860	158	752	95	1005	77	732	229	1038	3716
% App. Total	12.5	31.6	45.3	10.6		39.4	44	16.6		15.7	74.8	9.5		7.4	70.5	22.1		
PHF	.773	.803	.868	.896	.963	.778	.875	.917	.947	.919	.922	.766	.938	.875	.821	.895	.840	.954



Car

Study Name **WC10-2728_7 Broadway/51st Street/Pleasant Valley Avenue**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Broadway Southbound				Pleasant Valley Avenue Westbound				Broadway Northbound				51st Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	26	57	84	6	66	89	49	1	22	90	25	1	11	89	27	0
11:15 AM	27	66	103	14	72	96	31	1	36	97	18	1	19	87	42	0
11:30 AM	40	60	82	16	71	124	37	0	34	88	30	2	13	70	38	0
11:45 AM	35	69	81	18	72	123	42	0	46	89	29	0	18	103	45	0
12:00 PM	25	78	88	14	77	102	46	1	46	98	47	0	26	74	40	0
12:15 PM	31	76	100	16	63	111	37	0	42	114	21	0	16	124	35	0
12:30 PM	40	91	106	26	92	121	48	0	38	116	27	0	20	95	43	0
12:45 PM	34	85	97	16	86	116	41	0	43	130	29	0	25	92	40	0
1:00 PM	45	69	91	14	83	123	63	0	50	114	40	1	28	94	43	1
1:15 PM	44	86	83	15	99	142	51	0	51	158	39	3	22	103	50	0
1:30 PM	38	75	83	19	94	126	61	1	48	164	42	1	36	75	49	1
1:45 PM	32	77	90	10	83	121	50	0	34	121	31	1	30	113	33	0
2:00 PM	28	68	82	20	80	120	38	0	34	105	20	2	22	104	39	0
2:15 PM	32	71	103	15	74	116	38	2	30	98	40	0	26	72	43	0
2:30 PM	27	71	102	16	81	110	30	0	41	114	27	1	12	89	28	1
2:45 PM	31	77	98	19	89	138	38	0	35	99	33	1	17	111	37	0

	Broadway Southbound				Pleasant Valley Avenue Westbound				Broadway Northbound				51st Street Eastbound					
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	15-Min Total	Hour Total
11:00 AM	29	58	84	6	66	90	49	1	22	93	25	1	11	90	27	0	652	2857
11:15 AM	27	69	103	14	72	97	31	1	36	100	18	1	19	89	43	0	720	2975
11:30 AM	40	62	82	16	72	124	37	0	34	89	30	2	13	71	38	0	710	3046
11:45 AM	35	70	81	18	72	123	42	0	46	90	30	0	18	105	45	0	775	3207
12:00 PM	27	79	88	14	79	105	46	1	46	98	47	0	26	74	40	0	770	3278
12:15 PM	31	77	100	16	63	112	37	0	42	115	21	0	16	126	35	0	791	3373
12:30 PM	40	92	106	26	92	124	48	0	38	118	27	0	20	96	44	0	871	3535
12:45 PM	36	86	99	16	86	116	41	0	44	133	29	0	26	93	41	0	846	3586
1:00 PM	45	70	91	14	83	125	63	0	50	115	40	1	28	95	44	1	865	3574
1:15 PM	44	87	83	15	100	142	51	0	51	160	39	3	22	106	50	0	953	3477
1:30 PM	38	76	84	20	95	129	61	1	49	165	42	1	36	75	49	1	922	3291
1:45 PM	32	80	92	10	83	121	50	0	34	123	31	1	30	114	33	0	834	3127
2:00 PM	28	71	82	20	80	121	38	0	34	106	20	2	22	105	39	0	768	3123
2:15 PM	32	72	103	15	74	119	38	2	30	99	41	0	26	73	43	0	767	
2:30 PM	27	74	102	16	81	112	30	0	42	116	27	1	12	89	28	1	758	
2:45 PM	31	78	98	19	90	138	39	0	35	102	33	1	17	112	37	0	830	
Peak Hour	**163**	**319**	**357**	**65**	**364**	**512**	**216**	**1**	**194**	**573**	**150**	**5**	**112**	**369**	**184**	**2**	**0.94**	

Truck

Study Name **WC10-2728_7 Broadway/51st Street/Pleasant Valley Avenue**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound				Westbound Street Westbound				Northbound Street Northbound				Eastbound Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	3	1	0	0	0	1	0	0	0	3	0	0	0	1	0	0
11:15 AM	0	3	0	0	0	1	0	0	0	3	0	0	0	2	1	0
11:30 AM	0	2	0	0	1	0	0	0	0	1	0	0	0	1	0	0
11:45 AM	0	1	0	0	0	0	0	0	0	1	1	0	0	2	0	0
12:00 PM	2	1	0	0	2	3	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	0
12:30 PM	0	1	0	0	0	3	0	0	0	2	0	0	0	1	1	0
12:45 PM	2	1	2	0	0	0	0	0	1	3	0	0	1	1	1	0
1:00 PM	0	1	0	0	0	2	0	0	0	1	0	0	0	1	1	0
1:15 PM	0	1	0	0	1	0	0	0	0	2	0	0	0	3	0	0
1:30 PM	0	1	1	1	1	3	0	0	1	1	0	0	0	0	0	0
1:45 PM	0	3	2	0	0	0	0	0	0	2	0	0	0	1	0	0
2:00 PM	0	3	0	0	0	1	0	0	0	1	0	0	0	1	0	0
2:15 PM	0	1	0	0	0	3	0	0	0	1	1	0	0	1	0	0
2:30 PM	0	3	0	0	0	2	0	0	1	2	0	0	0	0	0	0
2:45 PM	0	1	0	0	1	0	1	0	0	3	0	0	0	1	0	0
Peak Hour	**2**	**4**	**3**	**1**	**2**	**5**	**0**	**0**	**2**	**7**	**0**	**0**	**1**	**5**	**2**	**0**

Pedal Bike (Road)

Study Name **WC10-2728_7 Broadway/51st Street/Pleasant Valley Avenue**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound				Westbound Street Westbound				Northbound Street Northbound				Eastbound Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	0	0	2	0	1	0	0	0	0	1	0	0	0	1	1	0
11:15 AM	1	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	3	4	0	0	0	0	0	0	3	0	0	0	2	0	0
11:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
12:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
1:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
2:00 PM	0	3	0	0	0	0	0	0	1	0	0	0	0	2	0	0
2:15 PM	0	0	0	0	0	2	0	0	1	1	0	0	0	0	0	0
2:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	2	2	0
2:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Peak Hour	**0**	**7**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**

People

Study Name WC10-2728_7 Broadway/51st Street/Pleasant Valley Avenue
Start Date 10/27/2012
Start Time 11:00 AM
Site Code

	Southbound Street Southbound		Westbound Street Westbound		Northbound Street Northbound		Eastbound Street Eastbound		
Start Time	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW	
11:00 AM	0	1	11	2	0	5	0	1	
11:15 AM	1	2	8	0	4	2	4	4	
11:30 AM	8	2	6	4	1	2	2	0	
11:45 AM	5	4	2	1	0	1	6	3	
12:00 PM	2	3	4	1	1	1	1	4	
12:15 PM	5	5	4	4	2	2	2	1	
12:30 PM	0	0	5	6	2	1	4	1	
12:45 PM	2	2	7	4	0	5	0	1	
1:00 PM	5	1	10	5	3	4	0	1	
1:15 PM	5	2	21	4	0	3	1	4	
1:30 PM	2	1	9	6	8	0	2	13	
1:45 PM	4	3	35	4	12	0	5	0	
2:00 PM	2	1	9	7	3	5	2	1	
2:15 PM	8	5	6	6	3	5	1	3	
2:30 PM	5	3	4	10	7	2	4	8	
2:45 PM	3	4	5	3	4	4	4	2	
Peak Hour	**14**	**6**	**47**	**19**	**11**	**12**	**3**	**19**	**0**
	20		66		23		22		

Pedal Bike (Crosswalk)

Study Name **WC10-2728_7 Broadway/51st Street/Pleasant Valley Avenue**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound		Westbound Street Westbound		Northbound Street Northbound		Eastbound Street Eastbound	
Start Time	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW
11:00 AM	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	1	0
11:45 AM	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	1	0	0
12:15 PM	0	1	1	2	1	0	1	1
12:30 PM	1	0	1	1	0	0	0	0
12:45 PM	0	0	1	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	1	0
1:15 PM	1	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	1	0
2:00 PM	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0
2:30 PM	0	0	1	0	0	0	0	0
2:45 PM	0	0	2	0	0	0	0	0
Peak Hour	**1**	**0**	**1**	**0**	**0**	**0**	**1**	**0**

Totals

Study Name **WC10-2728_7 Broadway/51st Street/Pleasant Valley Avenue**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound				Westbound Street Westbound				Northbound Street Northbound				Eastbound Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	29	58	86	6	67	90	49	1	22	94	25	1	11	91	28	0
11:15 AM	28	71	104	14	72	100	31	1	36	100	18	1	19	89	43	0
11:30 AM	40	65	86	16	72	124	37	0	34	92	30	2	13	73	38	0
11:45 AM	35	70	81	18	72	123	42	0	47	90	30	0	18	106	45	0
12:00 PM	27	79	88	14	79	107	46	1	46	98	47	0	26	75	40	0
12:15 PM	31	77	100	16	63	112	37	0	42	115	21	0	16	126	35	0
12:30 PM	40	95	106	26	92	126	48	0	38	118	27	0	20	96	44	0
12:45 PM	36	86	99	16	86	116	41	0	44	133	29	0	26	94	41	0
1:00 PM	45	71	91	14	83	126	63	0	50	115	40	1	28	95	44	1
1:15 PM	44	89	83	15	100	142	51	0	51	160	39	3	22	106	50	0
1:30 PM	38	80	84	20	95	129	61	1	49	165	42	1	36	75	49	1
1:45 PM	32	81	92	10	83	121	50	0	34	124	31	1	30	114	33	0
2:00 PM	28	74	82	20	80	121	38	0	35	106	20	2	22	107	39	0
2:15 PM	32	72	103	15	74	121	38	2	31	100	41	0	26	73	43	0
2:30 PM	27	75	102	16	81	113	30	0	42	116	27	1	12	91	30	1
2:45 PM	31	81	98	19	90	138	39	0	35	102	33	1	17	114	37	0
Peak Hour	**163**	**326**	**357**	**65**	**364**	**513**	**216**	**1**	**194**	**573**	**150**	**5**	**112**	**370**	**184**	**2**

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-037 BROADWAY-40TH-F
Site Code : 00000000
Start Date : 11/11/2008

Groups Printed- Unshifted

	BROADWAY Southbound						40TH ST. WAY Southwestbound						40TH ST. Westbound						BROADWAY Northbound						40TH ST. Eastbound								
Start Time	Hard Left	Left	Thru	Right	Peds	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	Peds	App. Total	Left	Thru	Right	Hard Right	Peds	App. Total	Left	Thru	Bear Right	Right	Peds	App. Total	Left	Bear Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	0	3	51	11	0	65	0	0	0	0	0	0	5	12	0	0	4	17	10	43	0	5	6	58	6	0	14	7	4	31	10	171	181
07:15	0	6	54	19	5	79	0	0	0	3	0	3	4	20	0	0	4	24	10	51	0	10	1	71	9	0	20	9	1	39	10	216	226
07:30	0	16	72	16	4	104	0	0	0	4	0	4	5	21	0	0	7	26	16	59	0	9	7	84	11	0	24	4	3	42	18	260	278
07:45	0	21	77	17	8	115	0	0	0	5	0	5	10	37	7	0	4	54	16	60	0	4	7	80	19	0	32	12	7	70	19	324	343
Total	0	46	254	63	17	363	0	0	0	12	0	12	24	90	7	0	19	121	52	213	0	28	21	293	45	0	90	32	15	182	57	971	1028
08:00	0	14	102	13	4	129	0	0	0	5	0	5	11	39	4	0	6	54	18	61	0	7	13	86	25	0	33	13	3	74	23	348	371
08:15	0	16	111	25	8	152	0	0	0	4	0	4	9	37	7	0	7	53	19	65	0	10	7	94	28	0	40	13	5	86	22	389	411
08:30	0	14	102	29	2	145	0	0	0	8	0	8	8	28	1	0	9	37	33	71	0	17	6	121	29	0	31	22	1	83	17	394	411
08:45	0	17	91	28	7	136	0	0	0	8	0	8	12	33	4	0	3	49	17	99	0	11	2	127	21	0	43	18	2	84	12	404	416
Total	0	61	406	95	21	562	0	0	0	25	0	25	40	137	16	0	25	193	87	296	0	45	28	428	103	0	147	66	11	327	74	1535	1609
*** BREAK ***																																	
16:00	0	6	111	33	7	150	0	0	0	11	0	11	14	35	16	0	4	65	21	139	0	13	9	173	47	0	56	19	7	129	20	528	548
16:15	0	7	113	24	9	144	0	0	0	6	0	6	17	54	18	0	7	89	27	133	0	14	7	174	42	0	64	25	8	139	23	552	575
16:30	0	3	121	21	7	145	0	0	0	9	0	9	19	34	14	0	3	67	31	157	0	14	14	202	52	0	75	32	5	164	24	587	611
16:45	0	11	119	24	9	154	0	0	0	7	0	7	18	44	17	0	9	79	30	170	0	16	6	216	47	0	60	34	4	145	24	601	625
Total	0	27	464	102	32	593	0	0	0	33	0	33	68	167	65	0	23	300	109	599	0	57	36	765	188	0	255	110	24	577	91	2268	2359
17:00	0	5	101	16	0	122	0	0	0	8	0	8	15	39	14	0	9	68	25	155	0	5	2	185	49	0	56	30	12	147	11	530	541
17:15	0	1	110	22	0	133	0	0	0	6	0	6	19	41	0	0	0	60	23	151	0	7	3	181	57	0	72	29	9	167	3	547	550
17:30	0	7	104	17	2	128	0	0	0	3	0	3	11	42	12	0	3	65	24	189	0	15	9	228	50	0	70	24	21	165	14	589	603
17:45	0	7	94	15	4	116	0	0	0	6	0	6	12	31	12	0	9	55	20	144	0	11	9	175	52	0	68	32	10	162	22	514	536
Total	0	20	409	70	6	499	0	0	0	23	0	23	57	153	38	0	21	248	92	639	0	38	23	769	208	0	266	115	52	641	50	2180	2230
Grand Total	0	154	1533	330	76	2017	0	0	0	93	0	93	189	547	126	0	88	862	340	1747	0	168	108	2255	544	0	758	323	102	1727	272	6954	7226
Apprch %	0	7.6	76	16.4			0	0	0	100			21.9	63.5	14.6	0			15.1	77.5	0	7.5			31.5	0	43.9	18.7	5.9				
Total %	0	2.2	22	4.7		29	0	0	0	1.3		1.3	2.7	7.9	1.8	0		12.4	4.9	25.1	0	2.4		32.4	7.8	0	10.9	4.6	1.5	24.8	3.8	96.2	

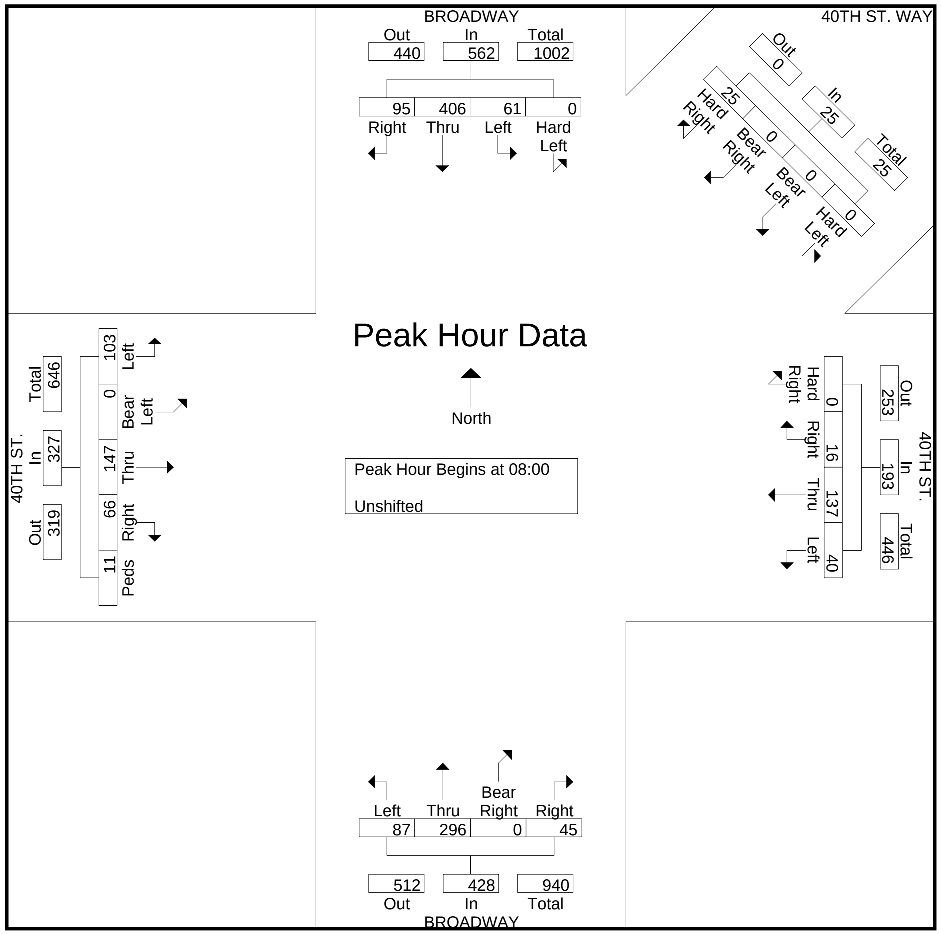
	BROADWAY Southbound					40TH ST. WAY Southwestbound					40TH ST. Westbound					BROADWAY Northbound					40TH ST. Eastbound						
Start Time	Hard Left	Left	Thru	Right	App. Total	Hard Left	Bear Left	Bear Right	Hard Right	App. Total	Left	Thru	Right	Hard Right	App. Total	Left	Thru	Bear Right	Right	App. Total	Left	Bear Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																											
Peak Hour for Entire Intersection Begins at 08:00																											
08:00	0	14	102	13	129	0	0	0	5	5	11	**39**	4	0	**54**	18	61	0	7	86	25	0	33	13	3	74	348
08:15	0	16	**111**	25	**152**	0	0	0	4	4	9	37	**7**	0	53	19	65	0	10	94	28	0	40	13	**5**	**86**	389
08:30	0	14	102	**29**	145	0	0	0	**8**	**8**	8	28	1	0	37	**33**	71	0	**17**	121	**29**	0	31	**22**	1	83	394
08:45	0	**17**	91	28	136	0	0	0	8	8	**12**	33	4	0	49	17	**99**	0	11	**127**	21	0	**43**	18	2	84	**404**
Total Volume	0	61	406	95	562	0	0	0	25	25	40	137	16	0	193	87	296	0	45	428	103	0	147	66	11	327	1535
% App. Total	0	10.9	72.2	16.9		0	0	0	100		20.7	71	8.3	0		20.3	69.2	0	10.5		31.5	0	45	20.2	3.4		
PHF	.000	.897	.914	.819	.924	.000	.000	.000	.781	.781	.833	.878	.571	.000	.894	.659	.747	.000	.662	.843	.888	.000	.855	.750	.550	.951	.950

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-037 BROADWAY-40TH-F
Site Code : 00000000
Start Date : 11/11/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:15

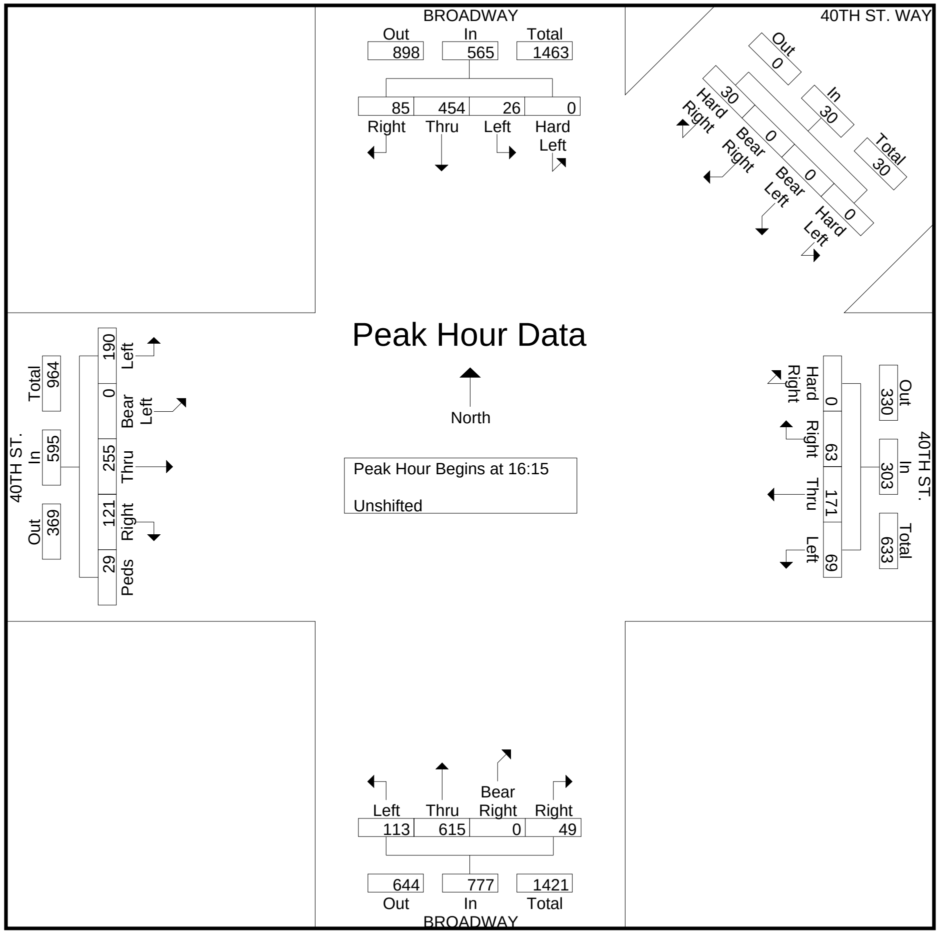
16:15	**0**	**7**	**113**	24	144	0	0	0	6	6	17	54	18	0	89	27	133	0	14	174	42	0	64	25	8	139	552
16:30	0	3	**121**	21	145	0	0	0	**9**	**9**	**19**	34	14	0	67	**31**	157	0	14	202	**52**	0	**75**	32	5	**164**	587
16:45	0	**11**	119	24	**154**	0	0	0	7	7	18	44	17	0	79	30	**170**	0	**16**	**216**	47	0	60	**34**	4	145	**601**
17:00	0	5	101	16	122	0	0	0	8	8	15	39	14	0	68	25	155	0	5	185	49	0	56	30	**12**	147	530
Total Volume	0	26	454	85	565	0	0	0	30	30	69	171	63	0	303	113	615	0	49	777	190	0	255	121	29	595	2270
% App. Total	0	4.6	80.4	15		0	0	0	100		22.8	56.4	20.8	0		14.5	79.2	0	6.3		31.9	0	42.9	20.3	4.9		
PHF	.000	.591	.938	.885	.917	.000	.000	.000	.833	.833	.908	.792	.875	.000	.851	.911	.904	.000	.766	.899	.913	.000	.850	.890	.604	.907	.944

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-037 BROADWAY-40TH-F
Site Code : 00000000
Start Date : 11/11/2008
Page No : 3



MARKS TRAFFIC DATA

CITY OF OAKLAND

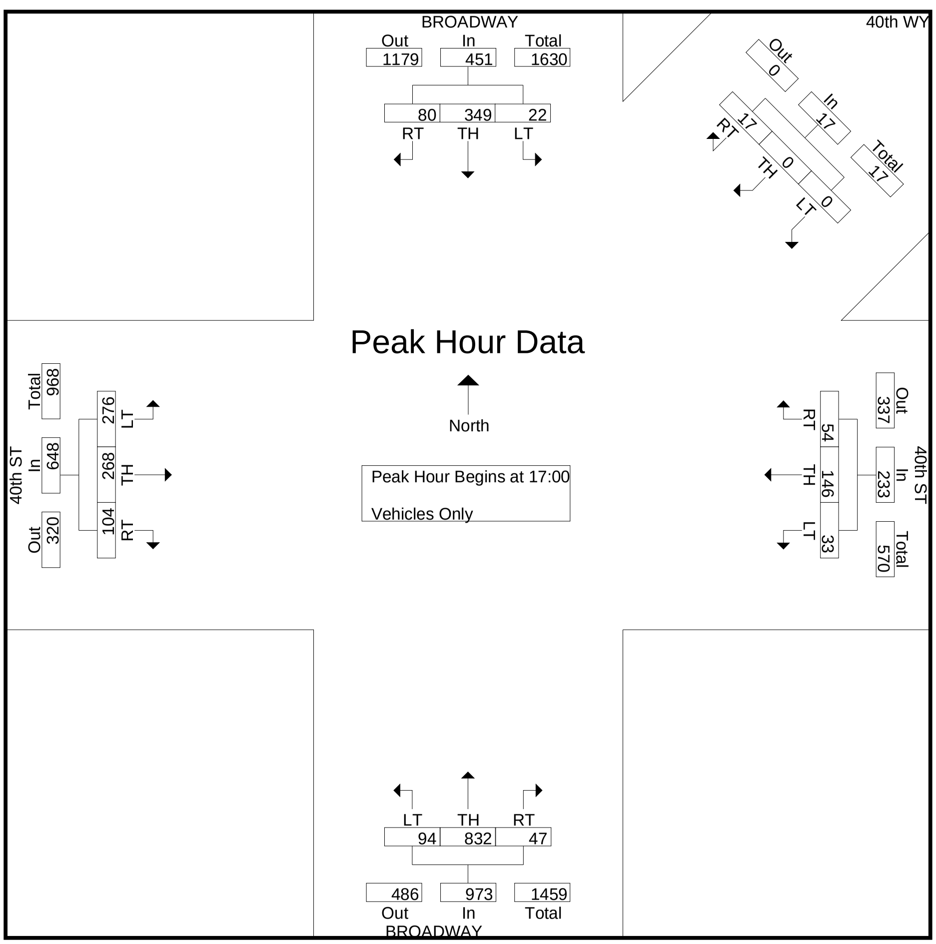
fp
Mietek 916-806-0250

File Name : broadway-40-p
Site Code : 9
Start Date : 5/4/2010
Page No : 1

Groups Printed- Vehicles Only

	BROADWAY Southbound				40th WY Southwestbound				40th ST Westbound				BROADWAY Northbound				40th ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	20	104	14	138	8	0	0	8	14	47	16	77	16	147	28	191	23	51	31	105	519
16:15	23	104	5	132	1	0	0	1	16	30	10	56	29	131	25	185	26	56	54	136	510
16:30	21	84	6	111	5	0	0	5	17	46	18	81	12	149	33	194	13	61	61	135	526
16:45	22	96	6	124	5	0	0	5	10	37	14	61	11	171	28	210	23	52	49	124	524
Total	86	388	31	505	19	0	0	19	57	160	58	275	68	598	114	780	85	220	195	500	2079
17:00	22	85	6	113	2	0	0	2	17	41	9	67	17	214	27	258	29	57	61	147	587
17:15	22	83	5	110	2	0	0	2	10	32	11	53	11	220	23	254	21	69	70	160	579
17:30	17	99	5	121	6	0	0	6	19	36	10	65	11	205	22	238	28	57	68	153	583
17:45	19	82	6	107	7	0	0	7	8	37	3	48	8	193	22	223	26	85	77	188	573
Total	80	349	22	451	17	0	0	17	54	146	33	233	47	832	94	973	104	268	276	648	2322
Grand Total	166	737	53	956	36	0	0	36	111	306	91	508	115	1430	208	1753	189	488	471	1148	4401
Apprch %	17.4	77.1	5.5		100	0	0		21.9	60.2	17.9		6.6	81.6	11.9		16.5	42.5	41		
Total %	3.8	16.7	1.2	21.7	0.8	0	0	0.8	2.5	7	2.1	11.5	2.6	32.5	4.7	39.8	4.3	11.1	10.7	26.1	

	BROADWAY Southbound				40th WY Southwestbound				40th ST Westbound				BROADWAY Northbound				40th ST Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	**22**	85	**6**	113	2	0	0	2	17	**41**	9	**67**	**17**	214	**27**	**258**	**29**	57	61	147	**587**
17:15	22	83	5	110	2	0	0	2	10	32	**11**	53	11	**220**	23	254	21	69	70	160	579
17:30	17	**99**	5	**121**	6	0	0	6	**19**	36	10	65	11	205	22	238	28	57	68	153	583
17:45	19	82	6	107	**7**	0	0	**7**	8	37	3	48	8	193	22	223	26	**85**	**77**	**188**	573
Total Volume	80	349	22	451	17	0	0	17	54	146	33	233	47	832	94	973	104	268	276	648	2322
% App. Total	17.7	77.4	4.9		100	0	0		23.2	62.7	14.2		4.8	85.5	9.7		16	41.4	42.6		
PHF	.909	.881	.917	.932	.607	.000	.000	.607	.711	.890	.750	.869	.691	.945	.870	.943	.897	.788	.896	.862	.989



Car

Study Name **WC10-2728_9 Broadway/40th Street/40th Street Way**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Broadway Southbound				40th Street Way Southwestbound	40th Street Westbound				Broadway Northbound				40th Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	35	76	6	4	6	5	16	8	1	6	83	20	3	20	49	30	1
11:15 AM	27	84	3	2	17	5	20	4	3	6	125	21	4	20	34	34	4
11:30 AM	36	79	6	0	14	6	19	5	3	5	100	16	7	25	35	35	4
11:45 AM	31	101	5	1	11	3	23	10	3	12	116	17	4	22	46	44	1
12:00 PM	38	127	3	2	13	5	23	8	4	11	126	12	8	30	36	39	2
12:15 PM	27	119	10	0	8	5	19	11	3	5	119	20	2	24	43	37	4
12:30 PM	30	118	7	0	14	7	22	8	3	7	133	15	7	36	44	42	0
12:45 PM	35	137	9	1	13	16	20	5	3	7	148	21	7	19	35	49	1
1:00 PM	46	119	9	2	27	2	31	8	0	10	151	10	4	36	58	42	0
1:15 PM	55	137	5	0	6	5	31	6	1	10	123	20	5	32	48	41	5
1:30 PM	19	153	5	3	11	5	22	5	1	7	109	28	5	34	40	56	0
1:45 PM	24	148	6	4	10	6	31	6	2	7	108	20	4	25	39	38	2
2:00 PM	25	108	5	1	7	5	33	10	0	6	91	11	4	15	46	47	1
2:15 PM	35	94	6	1	10	0	24	2	0	8	98	14	3	24	47	43	3
2:30 PM	32	128	3	0	7	3	25	5	0	9	93	20	0	21	41	33	1
2:45 PM	32	97	11	2	15	2	40	10	0	7	91	15	2	17	56	36	1

	Broadway Southbound				40th Street Way Southwestbound	40th Street Westbound				Broadway Northbound				40th Street Eastbound					
Start Time	Right	Thru	Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	15-Min Total	Hour Total
11:00 AM	35	76	6	4	6	5	16	8	1	6	83	20	3	20	49	30	1	369	1627
11:15 AM	27	84	3	2	17	5	20	4	3	6	125	21	4	20	34	34	4	413	1745
11:30 AM	36	79	6	0	14	6	19	5	3	5	100	16	7	25	35	35	4	395	1788
11:45 AM	31	101	5	1	11	3	23	10	3	12	116	17	4	22	46	44	1	450	1886
12:00 PM	38	127	3	2	13	5	23	8	4	11	126	12	8	30	36	39	2	487	1962
12:15 PM	27	119	10	0	8	5	19	11	3	5	119	20	2	24	43	37	4	456	2030
12:30 PM	30	118	7	0	14	7	22	8	3	7	133	15	7	36	44	42	0	493	2104
12:45 PM	35	137	9	1	13	16	20	5	3	7	148	21	7	19	35	49	1	526	2114
1:00 PM	46	119	9	2	27	2	31	8	0	10	151	10	4	36	58	42	0	555	2068
1:15 PM	55	137	5	0	6	5	31	6	1	10	123	20	5	32	48	41	5	530	1928
1:30 PM	19	153	5	3	11	5	22	5	1	7	109	28	5	34	40	56	0	503	1810
1:45 PM	24	148	6	4	10	6	31	6	2	7	108	20	4	25	39	38	2	480	1728
2:00 PM	25	108	5	1	7	5	33	10	0	6	91	11	4	15	46	47	1	415	1682
2:15 PM	35	94	6	1	10	0	24	2	0	8	98	14	3	24	47	43	3	412	
2:30 PM	32	128	3	0	7	3	25	5	0	9	93	20	0	21	41	33	1	421	
2:45 PM	32	97	11	2	15	2	40	10	0	7	91	15	2	17	56	36	1	434	
Peak Hour	**155**	**546**	**28**	**6**	**57**	**28**	**104**	**24**	**5**	**34**	**531**	**79**	**21**	**121**	**181**	**188**	**6**	**0.95**	

Truck

Study Name **WC10-2728_9 Broadway/40th Street/40th Street Way**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound				Westbound uthwestbou	Westbound Street Westbound				Northbound Street Northbound				Eastbound Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	0	2	0	0	1	0	1	0	0	0	1	1	0	1	0	0	0
11:15 AM	0	2	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0
11:30 AM	0	3	1	0	0	0	0	0	0	0	0	2	0	2	0	0	0
11:45 AM	0	2	0	0	0	0	0	0	0	0	2	2	0	1	0	0	0
12:00 PM	0	2	0	0	0	0	0	0	0	0	1	1	0	2	1	0	0
12:15 PM	0	2	0	0	0	0	0	0	0	0	2	1	0	2	0	0	0
12:30 PM	0	1	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0
12:45 PM	0	1	0	0	0	0	1	0	0	0	4	1	0	1	1	2	0
1:00 PM	2	2	0	0	0	0	0	0	0	0	2	1	0	2	0	0	0
1:15 PM	0	2	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0
1:30 PM	1	2	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0
1:45 PM	0	4	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0
2:00 PM	1	2	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0
2:15 PM	1	1	0	0	0	0	2	0	0	0	1	0	0	2	0	0	0
2:30 PM	2	2	0	0	0	0	0	0	0	0	3	1	0	1	0	0	0
2:45 PM	0	3	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0

Pedal Bike (Road)

Study Name **WC10-2728_9 Broadway/40th Street/40th Street Way**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound				Westbound uthwestbou	Westbound Street Westbound				Northbound Street Northbound				Eastbound Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
11:15 AM	0	1	1	0	0	0	1	0	0	0	2	1	0	1	1	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0
12:00 PM	0	1	0	0	0	0	0	0	0	0	2	1	0	0	1	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0
12:30 PM	0	2	0	0	0	0	2	0	0	0	1	1	0	0	1	0	0
12:45 PM	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
1:00 PM	0	2	0	0	0	0	1	0	0	0	1	0	0	0	2	0	0
1:15 PM	0	2	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0
1:30 PM	0	2	0	0	0	0	0	0	0	0	3	2	0	0	1	0	0
1:45 PM	0	1	0	0	0	0	2	0	0	0	0	1	0	0	1	0	0
2:00 PM	0	4	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0
2:15 PM	0	3	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0
2:30 PM	1	2	0	0	0	0	0	0	0	1	3	0	0	0	2	0	0
2:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
Peak Hour	**0**	**7**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**6**	**3**	**0**	**2**	**3**	**0**	**0**

People

Study Name **WC10-2728_9 Broadway/40th Street/40th Street Way**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound		Westbound Street Westbound		Northbound Street Northbound		Eastbound Street Eastbound	
Start Time	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW
11:00 AM	12	7	6	0	4	3	3	7
11:15 AM	5	9	3	5	4	2	5	9
11:30 AM	2	6	6	8	10	5	1	4
11:45 AM	10	6	10	4	13	3	0	5
12:00 PM	10	2	10	4	8	4	5	4
12:15 PM	13	11	13	3	21	3	7	7
12:30 PM	6	11	6	5	5	8	5	11
12:45 PM	9	4	7	11	3	4	6	5
1:00 PM	5	1	5	16	4	6	6	6
1:15 PM	11	4	7	6	2	4	7	1
1:30 PM	9	5	4	3	5	3	10	5
1:45 PM	10	4	6	5	6	5	12	2
2:00 PM	14	4	3	1	2	4	3	3
2:15 PM	15	4	9	3	2	5	11	2
2:30 PM	9	1	2	2	6	2	3	4
2:45 PM	6	2	0	2	7	0	7	6
Peak Hour	**34**	**14**	**23**	**36**	**14**	**17**	**29**	**17**
	48		59		31		46	

Pedal Bike (Crosswalk)

Study Name **WC10-2728_9 Broadway/40th Street/40th Street Way**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound		Westbound Street Westbound		Northbound Street Northbound		Eastbound Street Eastbound	
Start Time	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW
11:00 AM	0	0	0	1	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0
11:30 AM	1	0	0	0	0	0	0	0
11:45 AM	1	0	0	0	0	0	0	1
12:00 PM	0	0	1	1	0	0	0	0
12:15 PM	2	0	2	0	1	0	0	0
12:30 PM	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0
1:15 PM	1	0	1	0	0	1	0	1
1:30 PM	4	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	3
2:15 PM	0	0	0	0	3	0	0	1
2:30 PM	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0
Peak Hour	**5**	**0**	**1**	**0**	**0**	**1**	**0**	**1**

Totals

Study Name **WC10-2728_9 Broadway/40th Street/40th Street Way**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound				Westbound uthwestbou	Westbound Street Westbound				Northbound Street Northbound				Eastbound Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	36	78	6	4	8	5	17	8	1	6	84	22	3	21	49	30	1
11:15 AM	27	87	4	2	17	5	21	4	3	6	129	22	4	22	35	34	4
11:30 AM	36	82	7	0	14	6	19	5	3	5	104	18	7	27	35	35	4
11:45 AM	31	103	5	1	11	3	23	10	3	12	120	19	4	23	47	44	1
12:00 PM	38	130	3	2	13	5	23	8	4	11	129	14	8	32	38	39	2
12:15 PM	27	121	10	0	8	5	19	11	3	5	121	22	2	28	43	37	4
12:30 PM	30	121	7	0	14	7	24	8	3	7	137	18	7	36	45	42	0
12:45 PM	35	139	9	1	13	16	21	5	3	7	153	23	7	20	36	51	1
1:00 PM	48	123	9	2	27	2	32	8	0	10	154	11	4	38	60	42	0
1:15 PM	55	141	5	0	6	5	31	6	1	11	125	21	5	35	48	41	5
1:30 PM	20	157	5	3	11	5	22	5	1	7	113	31	5	35	42	56	0
1:45 PM	24	153	6	4	10	6	33	6	2	7	109	23	4	25	40	38	2
2:00 PM	26	114	5	1	7	5	34	10	0	6	92	13	4	16	47	47	1
2:15 PM	36	98	6	1	10	0	27	2	0	8	99	14	3	26	51	43	3
2:30 PM	35	132	3	0	7	3	25	5	0	10	99	21	0	22	43	33	1
2:45 PM	32	100	11	2	15	2	41	10	0	7	93	16	2	17	57	36	1

MARKS TRAFFIC DATA

CITY OF OAKLAND

fp
Mietek 916-806-0250

File Name : broadway-40-s
Site Code : 9
Start Date : 5/8/2010
Page No : 1

Groups Printed- Vehicles Only

	BROADWAY Southbound				**40th WY Southwestbound**				**40th ST Westbound**				**BROADWAY Northbound**				**40th ST Eastbound**				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	22	93	8	123	4	0	0	4	6	21	1	28	5	67	10	82	31	48	40	119	356
16:15	21	82	4	107	7	0	0	7	3	28	1	32	3	97	10	110	32	46	50	128	384
16:30	22	100	4	126	8	0	0	8	8	23	5	36	7	85	27	119	26	53	44	123	412
16:45	28	82	3	113	2	0	0	2	3	20	8	31	5	92	15	112	30	31	36	97	355
Total	93	357	19	469	21	0	0	21	20	92	15	127	20	341	62	423	119	178	170	467	1507
17:00	23	70	3	96	5	0	0	5	3	28	4	35	6	78	24	108	31	40	40	111	355
17:15	22	79	5	106	7	0	0	7	4	33	3	40	5	85	18	108	26	49	39	114	375
17:30	19	83	9	111	4	0	0	4	3	17	6	26	9	79	21	109	28	27	29	84	334
17:45	19	72	6	97	2	0	0	2	3	21	2	26	7	84	14	105	32	43	26	101	331
Total	83	304	23	410	18	0	0	18	13	99	15	127	27	326	77	430	117	159	134	410	1395
18:00	21	89	3	113	4	0	0	4	7	21	7	35	3	85	21	109	24	33	36	93	354
18:15	16	76	4	96	1	0	0	1	3	15	6	24	4	81	22	107	32	42	36	110	338
18:30	18	67	3	88	4	0	0	4	2	13	7	22	3	64	18	85	34	36	26	96	295
18:45	12	59	6	77	3	0	0	3	3	11	3	17	2	65	22	89	28	37	39	104	290
Total	67	291	16	374	12	0	0	12	15	60	23	98	12	295	83	390	118	148	137	403	1277
Grand Total	243	952	58	1253	51	0	0	51	48	251	53	352	59	962	222	1243	354	485	441	1280	4179
Apprch %	19.4	76	4.6		100	0	0		13.6	71.3	15.1		4.7	77.4	17.9		27.7	37.9	34.5		
Total %	5.8	22.8	1.4	30	1.2	0	0	1.2	1.1	6	1.3	8.4	1.4	23	5.3	29.7	8.5	11.6	10.6	30.6	

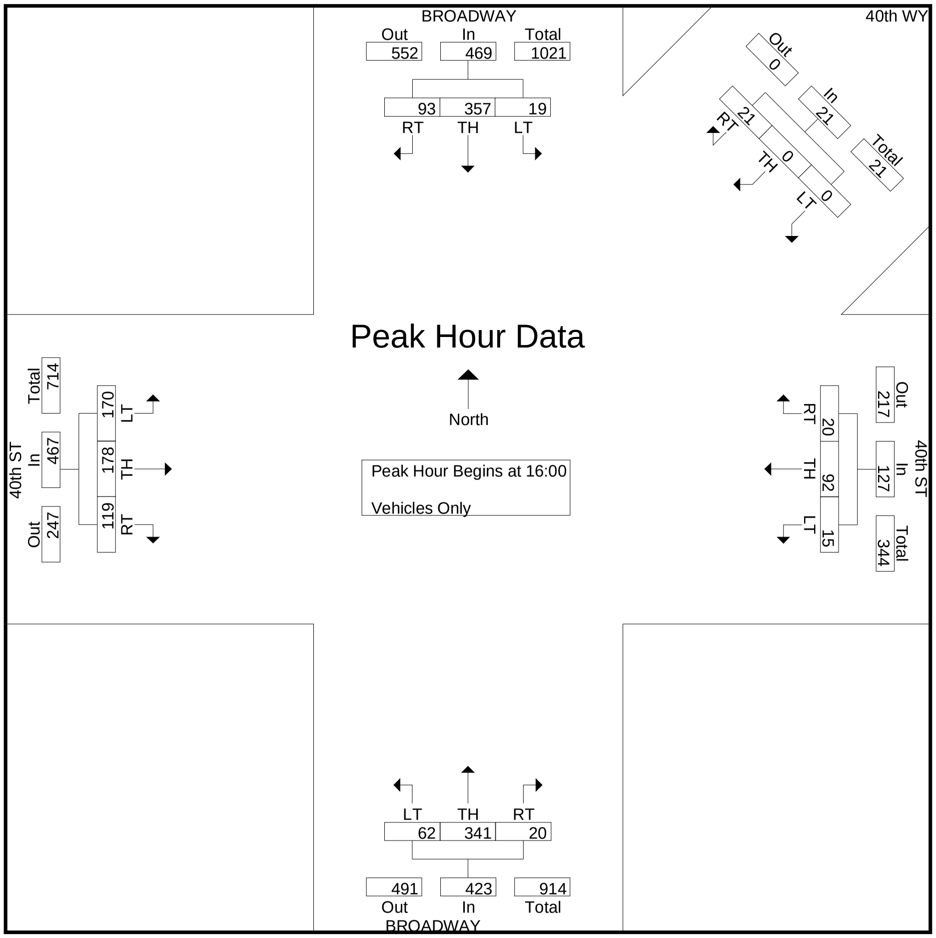
	BROADWAY Southbound				**40th WY Southwestbound**				**40th ST Westbound**				**BROADWAY Northbound**				**40th ST Eastbound**				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 18:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:00																					
16:00	22	93	**8**	123	4	0	0	4	6	21	1	28	5	67	10	82	31	48	40	119	356
16:15	21	82	4	107	7	0	0	7	3	**28**	1	32	3	**97**	10	110	**32**	46	**50**	**128**	384
16:30	22	**100**	4	**126**	**8**	0	0	**8**	**8**	23	5	**36**	**7**	85	**27**	**119**	26	**53**	44	123	**412**
16:45	**28**	82	3	113	2	0	0	2	3	20	**8**	31	5	92	15	112	30	31	36	97	355
Total Volume	93	357	19	469	21	0	0	21	20	92	15	127	20	341	62	423	119	178	170	467	1507
% App. Total	19.8	76.1	4.1		100	0	0		15.7	72.4	11.8		4.7	80.6	14.7		25.5	38.1	36.4		
PHF	.830	.893	.594	.931	.656	.000	.000	.656	.625	.821	.469	.882	.714	.879	.574	.889	.930	.840	.850	.912	.914

MARKS TRAFFIC DATA

CITY OF OAKLAND

fp
Mietek 916-806-0250

File Name : broadway-40-s
Site Code : 9
Start Date : 5/8/2010
Page No : 2



All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-015 TELEGRAPH-MACARTHUR-F
Site Code : 00000000
Start Date : 11/11/2008
Page No : 1

Groups Printed- Unshifted

	TELEGRAPH AVE. Southbound					MACARTHUR BLVD. Westbound					TELEGRAPH AVE. Northbound					MACARTHUR BLVD. Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	2	36	2	6	40	10	47	9	2	66	14	34	7	1	55	2	32	37	3	71	12	232	244
07:15	12	48	2	6	62	21	54	14	7	89	16	44	10	3	70	6	49	37	5	92	21	313	334
07:30	15	45	5	3	65	20	56	18	10	94	15	66	8	3	89	4	59	33	7	96	23	344	367
07:45	15	59	12	7	86	23	69	21	2	113	21	69	14	10	104	5	80	26	12	111	31	414	445
Total	44	188	21	22	253	74	226	62	21	362	66	213	39	17	318	17	220	133	27	370	87	1303	1390
08:00	20	74	6	7	100	24	73	19	4	116	24	58	17	12	99	12	74	24	5	110	28	425	453
08:15	18	81	8	12	107	18	72	18	8	108	30	69	19	13	118	13	80	28	6	121	39	454	493
08:30	27	70	12	6	109	17	79	23	6	119	17	81	16	6	114	12	66	31	2	109	20	451	471
08:45	16	69	12	9	97	16	68	17	11	101	20	90	8	10	118	13	63	29	8	105	38	421	459
Total	81	294	38	34	413	75	292	77	29	444	91	298	60	41	449	50	283	112	21	445	125	1751	1876
*** BREAK ***																							
16:00	48	127	19	17	194	27	59	12	7	98	50	108	19	8	177	12	81	48	8	141	40	610	650
16:15	42	112	20	9	174	21	68	19	8	108	51	110	17	8	178	18	80	52	10	150	35	610	645
16:30	49	154	18	15	221	24	64	24	13	112	54	126	11	11	191	18	82	46	5	146	44	670	714
16:45	49	116	20	12	185	32	71	19	11	122	44	130	12	14	186	16	79	43	12	138	49	631	680
Total	188	509	77	53	774	104	262	74	39	440	199	474	59	41	732	64	322	189	35	575	168	2521	2689
17:00	42	131	19	19	192	30	73	26	4	129	47	132	17	15	196	16	84	44	11	144	49	661	710
17:15	52	144	22	9	218	30	62	26	10	118	54	120	19	14	193	10	80	32	9	122	42	651	693
17:30	28	142	22	14	192	20	55	31	6	106	52	111	27	8	190	18	75	39	4	132	32	620	652
17:45	27	123	17	5	167	24	52	23	2	99	42	103	14	10	159	15	64	32	5	111	22	536	558
Total	149	540	80	47	769	104	242	106	22	452	195	466	77	47	738	59	303	147	29	509	145	2468	2613
Grand Total	462	1531	216	156	2209	357	1022	319	111	1698	551	1451	235	146	2237	190	1128	581	112	1899	525	8043	8568
Apprch %	20.9	69.3	9.8			21	60.2	18.8			24.6	64.9	10.5			10	59.4	30.6					
Total %	5.7	19	2.7		27.5	4.4	12.7	4		21.1	6.9	18	2.9		27.8	2.4	14	7.2		23.6	6.1	93.9	

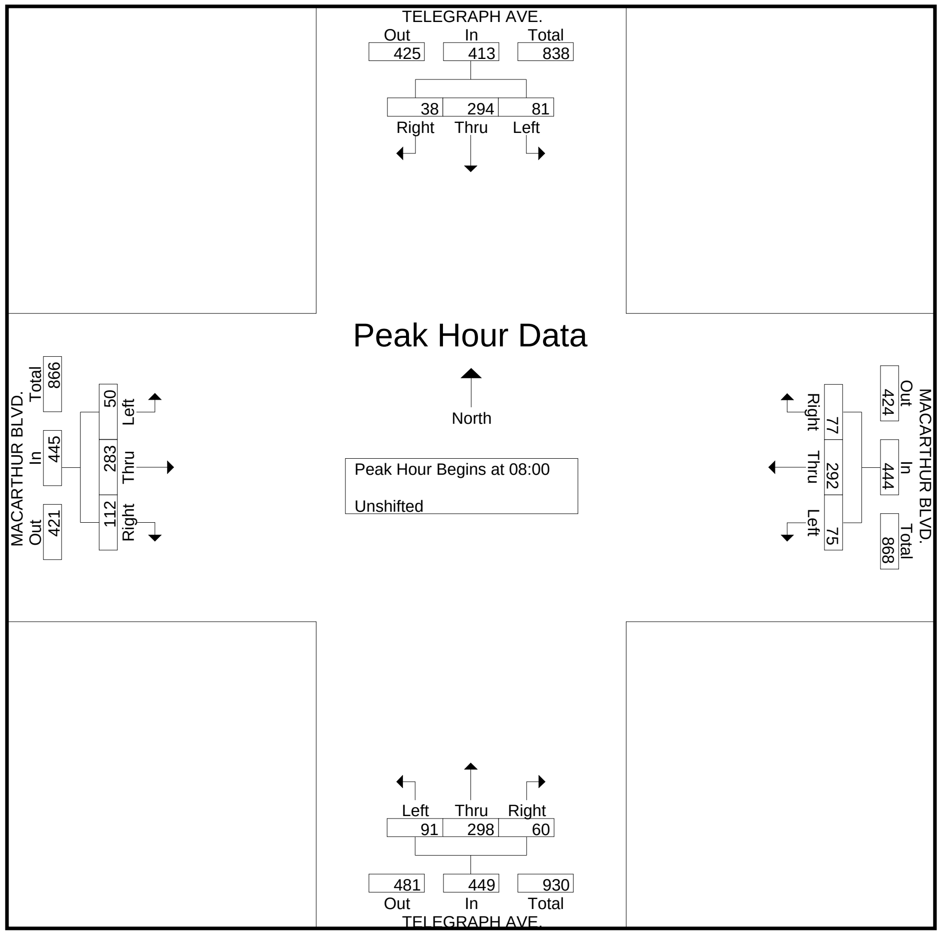
	TELEGRAPH AVE. Southbound				MACARTHUR BLVD. Westbound				TELEGRAPH AVE. Northbound				MACARTHUR BLVD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	20	74	6	100	**24**	73	19	116	24	58	17	99	12	74	24	110	425
08:15	18	**81**	8	107	18	72	18	108	**30**	69	**19**	**118**	**13**	**80**	28	**121**	**454**
08:30	**27**	70	**12**	**109**	17	**79**	**23**	**119**	17	81	16	114	12	66	**31**	109	451
08:45	16	69	12	97	16	68	17	101	20	**90**	8	118	13	63	29	105	421
Total Volume	81	294	38	413	75	292	77	444	91	298	60	449	50	283	112	445	1751
% App. Total	19.6	71.2	9.2		16.9	65.8	17.3		20.3	66.4	13.4		11.2	63.6	25.2		
PHF	.750	.907	.792	.947	.781	.924	.837	.933	.758	.828	.789	.951	.962	.884	.903	.919	.964

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-015 TELEGRAPH-MACARTHUR-F
Site Code : 00000000
Start Date : 11/11/2008
Page No : 2



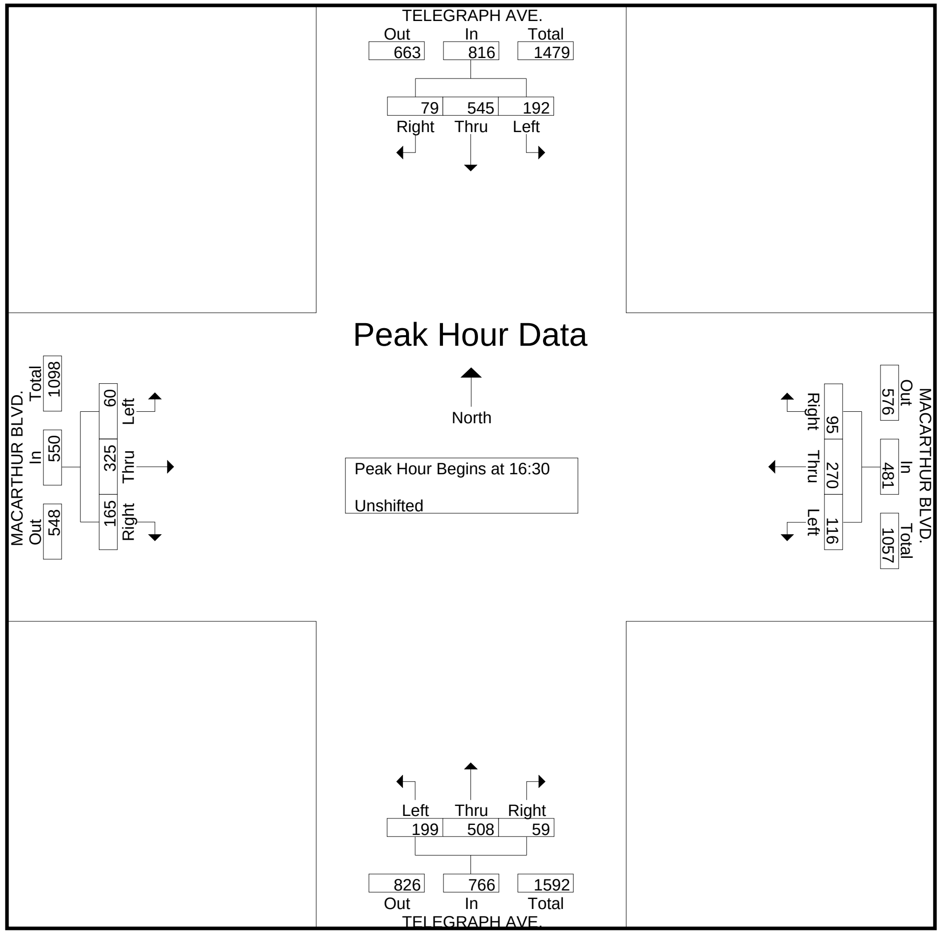
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:30

16:30	49	**154**	18	**221**	24	64	24	112	**54**	126	11	191	**18**	82	**46**	**146**	**670**
16:45	49	116	20	185	**32**	71	19	122	44	130	12	186	16	79	43	138	631
17:00	42	131	19	192	30	**73**	**26**	**129**	47	**132**	17	**196**	16	**84**	44	144	661
17:15	**52**	144	**22**	218	30	62	26	118	54	120	**19**	193	10	80	32	122	651
Total Volume	192	545	79	816	116	270	95	481	199	508	59	766	60	325	165	550	2613
% App. Total	23.5	66.8	9.7		24.1	56.1	19.8		26	66.3	7.7		10.9	59.1	30		
PHF	.923	.885	.898	.923	.906	.925	.913	.932	.921	.962	.776	.977	.833	.967	.897	.942	.975

All Traffic Data
(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-015 TELEGRAPH-MACARTHUR-F
Site Code : 00000000
Start Date : 11/11/2008
Page No : 3



Study Name WC09-2618 -- Telegraph Ave/MacArthur Blvd
Start Date Saturday, November 10, 2012 12:00 PM
End Date Saturday, November 10, 2012 4:00 PM
Site Code

Report Summary

		Southbound						Westbound						Northbound						Eastbound							Crosswalk			
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Peopleike (Cro		Total
Peak 1	Car	81	375	97	4	557	669	154	257	49	0	460	309	56	411	84	0	551	482	58	156	100	4	318	426	1886	SB	47	0	47
Specified Period	%	96%	92%	98%	100%	94%	95%	98%	98%	100%	0%	98%	98%	97%	94%	93%	0%	94%	94%	98%	99%	97%	100%	98%	97%	96%		100%	0%	
12:00 PM - 4:00 PM	Truck	1	5	1	0	7	8	2	3	0	0	5	2	0	5	0	0	5	6	1	1	1	0	3	4	20	WB	41	4	45
One Hour Peak	%	1%	1%	1%	0%	1%	1%	1%	1%	0%	0%	1%	1%	0%	1%	0%	0%	1%	1%	2%	1%	1%	0%	1%	1%	1%		91%	9%	
1:00 PM - 2:00 PM	edal Bike (Roa	2	26	1	0	29	22	1	2	0	0	3	4	2	21	4	0	27	26	0	1	0	0	1	8	60	NB	21	1	22
	%	2%	6%	1%	0%	5%	3%	1%	1%	0%	0%	1%	1%	3%	5%	4%	0%	5%	5%	0%	1%	0%	0%	0%	2%	3%		95%	5%	
	Motor Bike	0	1	0	0	1	4	0	0	0	0	0	0	0	2	2	0	4	1	0	0	2	0	2	2	7	EB	40	1	41
	%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	2%	0%	1%	0%	0%		98%	2%	
	Total	**84**	**407**	**99**	**4**	**594**	**703**	**157**	**262**	**49**	**0**	**468**	**315**	**58**	**439**	**90**	**0**	**587**	**515**	**59**	**158**	**103**	**4**	**324**	**440**	**1973**		**149**	**6**	**155**
	PHF	0.72	0.88	0.8	0.33	0.92	0.96	0.78	0.83	0.68	0	0.94	0.92	0.69	0.9	0.9	0	0.94	0.9	0.78	0.86	0.89	0.33	0.93	0.91	0.97				
	Approach %					30%	36%					24%	16%					30%	26%					16%	22%					

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

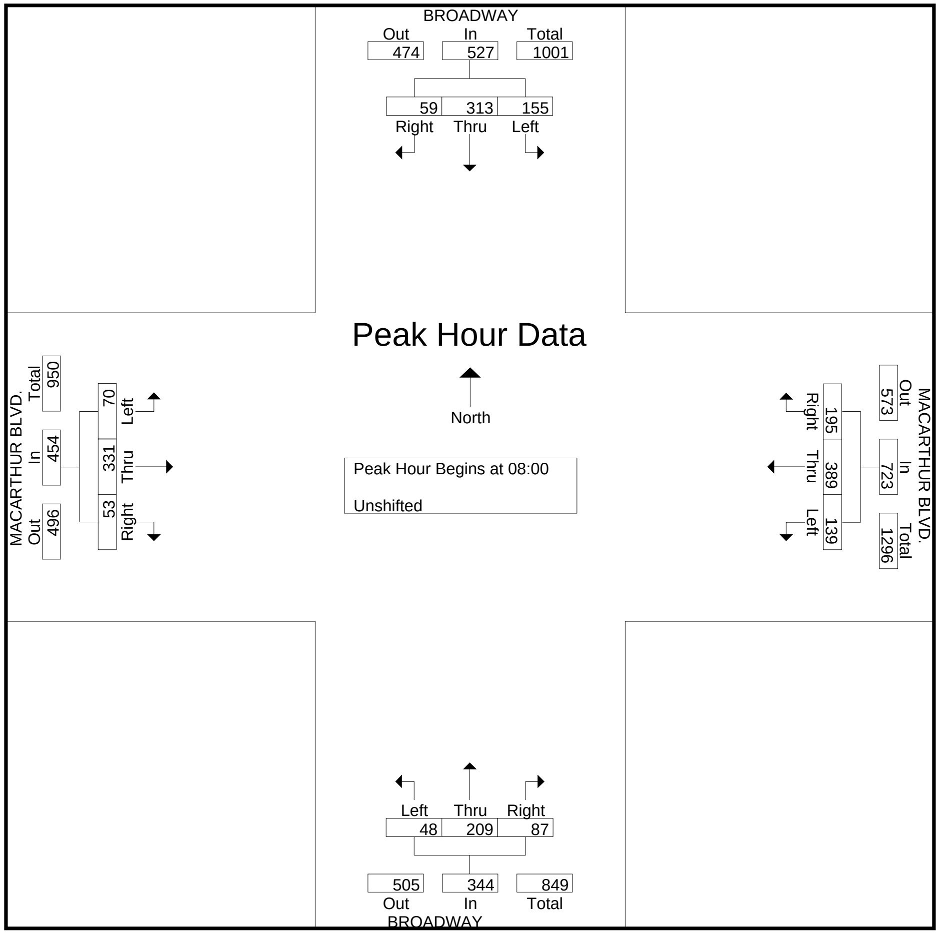
File Name : 08-7650-036 BROADWAY-MACARTHUR-F
Site Code : 00000000
Start Date : 11/11/2008
Page No : 1

Groups Printed- Unshifted

	BROADWAY Southbound					MACARTHUR BLVD. Westbound					BROADWAY Northbound					MACARTHUR BLVD. Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	24	36	13	4	73	18	58	29	12	105	7	24	10	17	41	15	59	4	7	78	40	297	337
07:15	17	42	15	2	74	22	81	27	18	130	13	24	14	8	51	16	60	9	14	85	42	340	382
07:30	22	51	10	10	83	21	80	39	19	140	9	43	20	19	72	14	58	4	5	76	53	371	424
07:45	30	61	18	9	109	43	105	44	20	192	6	42	14	15	62	14	90	12	13	116	57	479	536
Total	93	190	56	25	339	104	324	139	69	567	35	133	58	59	226	59	267	29	39	355	192	1487	1679
08:00	46	71	17	10	134	35	101	40	21	176	10	49	27	11	86	21	95	8	11	124	53	520	573
08:15	41	81	13	16	135	37	101	47	24	185	12	47	25	18	84	18	92	14	17	124	75	528	603
08:30	31	88	14	12	133	30	92	53	19	175	15	50	16	18	81	16	83	18	7	117	56	506	562
08:45	37	73	15	9	125	37	95	55	35	187	11	63	19	15	93	15	61	13	7	89	66	494	560
Total	155	313	59	47	527	139	389	195	99	723	48	209	87	62	344	70	331	53	42	454	250	2048	2298
*** BREAK ***																							
16:00	63	86	10	43	159	25	106	53	18	184	34	95	32	22	161	24	108	27	4	159	87	663	750
16:15	72	88	9	15	169	35	98	55	23	188	27	114	16	10	157	27	104	19	14	150	62	664	726
16:30	49	119	8	14	176	28	100	36	14	164	38	164	19	6	221	33	148	18	5	199	39	760	799
16:45	47	123	8	15	178	25	107	47	12	179	41	170	28	6	239	32	134	20	2	186	35	782	817
Total	231	416	35	87	682	113	411	191	67	715	140	543	95	44	778	116	494	84	25	694	223	2869	3092
17:00	63	93	9	6	165	25	118	39	14	182	32	145	27	8	204	25	206	12	1	243	29	794	823
17:15	69	86	11	13	166	25	101	60	18	186	33	136	36	9	205	23	152	14	7	189	47	746	793
17:30	52	82	10	3	144	18	96	71	16	185	24	140	17	13	181	20	137	12	9	169	41	679	720
17:45	62	75	10	8	147	23	87	49	7	159	21	127	24	6	172	23	111	8	0	142	21	620	641
Total	246	336	40	30	622	91	402	219	55	712	110	548	104	36	762	91	606	46	17	743	138	2839	2977
Grand Total	725	1255	190	189	2170	447	1526	744	290	2717	333	1433	344	201	2110	336	1698	212	123	2246	803	9243	10046
Apprch %	33.4	57.8	8.8			16.5	56.2	27.4			15.8	67.9	16.3			15	75.6	9.4					
Total %	7.8	13.6	2.1		23.5	4.8	16.5	8		29.4	3.6	15.5	3.7		22.8	3.6	18.4	2.3		24.3	8	92	

	BROADWAY Southbound				MACARTHUR BLVD. Westbound				BROADWAY Northbound				MACARTHUR BLVD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	**46**	71	**17**	134	35	**101**	40	176	10	49	**27**	86	**21**	**95**	8	**124**	520
08:15	41	81	13	**135**	**37**	101	47	185	12	47	25	84	18	92	14	124	**528**
08:30	31	**88**	14	133	30	92	53	175	**15**	50	16	81	16	83	**18**	117	506
08:45	37	73	15	125	37	95	**55**	**187**	11	**63**	19	**93**	15	61	13	89	494
Total Volume	155	313	59	527	139	389	195	723	48	209	87	344	70	331	53	454	2048
% App. Total	29.4	59.4	11.2		19.2	53.8	27		14	60.8	25.3		15.4	72.9	11.7		
PHF	.842	.889	.868	.976	.939	.963	.886	.967	.800	.829	.806	.925	.833	.871	.736	.915	.970

OAKLAND



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:30

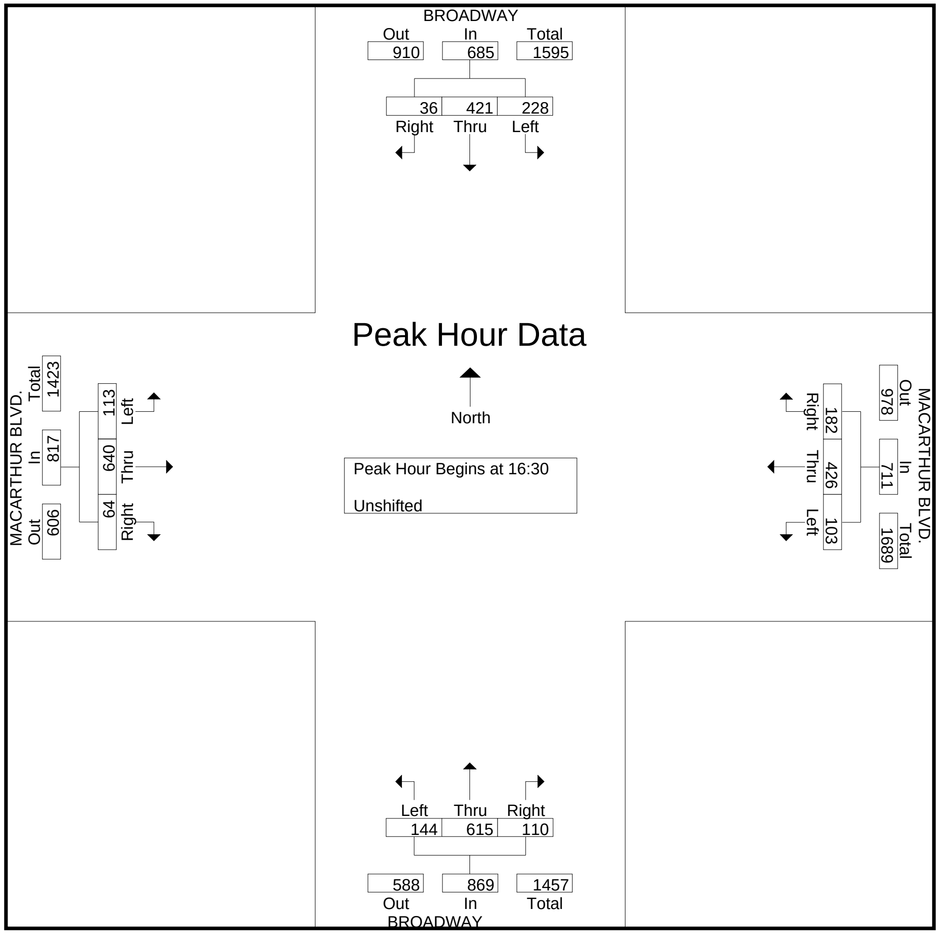
16:30	49	119	8	176	**28**	100	36	164	38	164	19	221	**33**	148	18	199	760
16:45	47	**123**	8	**178**	25	107	47	179	**41**	**170**	28	**239**	32	134	**20**	186	782
17:00	63	93	9	165	25	**118**	39	182	32	145	27	204	25	**206**	12	**243**	**794**
17:15	**69**	86	**11**	166	25	101	**60**	**186**	33	136	**36**	205	23	152	14	189	746
Total Volume	228	421	36	685	103	426	182	711	144	615	110	869	113	640	64	817	3082
% App. Total	33.3	61.5	5.3		14.5	59.9	25.6		16.6	70.8	12.7		13.8	78.3	7.8		
PHF	.826	.856	.818	.962	.920	.903	.758	.956	.878	.904	.764	.909	.856	.777	.800	.841	.970

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-036 BROADWAY-MACARTHUR-F
Site Code : 00000000
Start Date : 11/11/2008
Page No : 3



MARKS TRAFFIC DATA

CITY OF OAKLAND

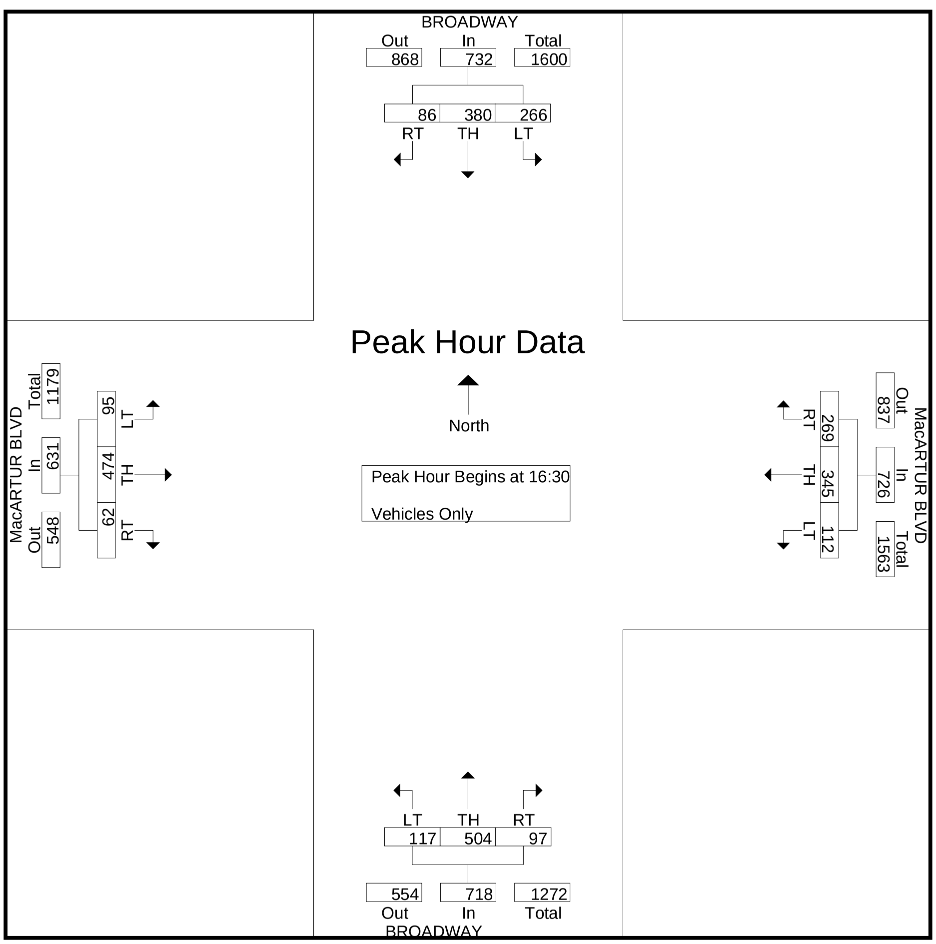
fp
Mietek 916-806-0250

File Name : broadway-macarthur-p
Site Code : 10
Start Date : 5/11/2010
Page No : 1

Groups Printed- Vehicles Only

	BROADWAY Southbound				MacARTUR BLVD Westbound				BROADWAY Northbound				MacARTUR BLVD Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	30	67	54	151	63	101	23	187	34	103	23	160	30	94	17	141	639
16:15	29	93	65	187	55	84	18	157	28	112	25	165	14	96	16	126	635
16:30	24	87	78	189	68	99	35	202	19	119	29	167	14	128	29	171	729
16:45	21	112	65	198	69	69	26	164	26	123	26	175	18	124	19	161	698
Total	104	359	262	725	255	353	102	710	107	457	103	667	76	442	81	599	2701
17:00	18	96	61	175	67	84	29	180	20	127	32	179	14	101	26	141	675
17:15	23	85	62	170	65	93	22	180	32	135	30	197	16	121	21	158	705
17:30	18	83	55	156	67	80	20	167	22	147	34	203	15	129	17	161	687
17:45	14	72	50	136	69	90	20	179	14	119	20	153	11	105	25	141	609
Total	73	336	228	637	268	347	91	706	88	528	116	732	56	456	89	601	2676
Grand Total	177	695	490	1362	523	700	193	1416	195	985	219	1399	132	898	170	1200	5377
Apprch %	13	51	36		36.9	49.4	13.6		13.9	70.4	15.7		11	74.8	14.2		
Total %	3.3	12.9	9.1	25.3	9.7	13	3.6	26.3	3.6	18.3	4.1	26	2.5	16.7	3.2	22.3	

	BROADWAY Southbound				MacARTUR BLVD Westbound				BROADWAY Northbound				MacARTUR BLVD Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	**24**	87	**78**	189	68	**99**	**35**	**202**	19	119	29	167	14	**128**	**29**	**171**	**729**
16:45	21	**112**	65	**198**	**69**	69	26	164	26	123	26	175	**18**	124	19	161	698
17:00	18	96	61	175	67	84	29	180	20	127	**32**	179	14	101	26	141	675
17:15	23	85	62	170	65	93	22	180	**32**	**135**	30	**197**	16	121	21	158	705
Total Volume	86	380	266	732	269	345	112	726	97	504	117	718	62	474	95	631	2807
% App. Total	11.7	51.9	36.3		37.1	47.5	15.4		13.5	70.2	16.3		9.8	75.1	15.1		
PHF	.896	.848	.853	.924	.975	.871	.800	.899	.758	.933	.914	.911	.861	.926	.819	.923	.963



Car

Study Name **WC10-2728_10 Broadway/W MacArthur Blvd**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Broadway Southbound				McArthur Blvd Westbound				Broadway Northbound				McArthur Blvd Eastbound			
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	15	71	32	1	60	90	22	0	20	54	14	0	7	64	11	1
11:15 AM	13	55	38	1	79	99	15	1	18	64	16	0	6	56	12	1
11:30 AM	11	57	50	1	68	101	25	1	13	44	23	0	10	69	13	0
11:45 AM	15	81	45	0	81	95	14	1	11	57	7	1	7	69	14	0
12:00 PM	24	88	63	2	76	89	13	1	11	78	21	0	6	65	15	3
12:15 PM	11	83	61	1	90	89	29	0	11	58	16	0	7	53	14	1
12:30 PM	12	108	59	3	68	95	21	0	16	76	20	0	7	68	13	0
12:45 PM	12	74	52	2	99	95	16	0	11	73	18	1	8	71	17	1
1:00 PM	16	112	61	4	84	82	26	1	4	92	27	0	17	70	12	3
1:15 PM	19	93	68	1	57	72	13	2	10	80	12	0	7	60	20	4
1:30 PM	21	100	75	1	56	87	14	0	18	76	19	2	7	70	12	3
1:45 PM	22	94	73	0	66	76	11	1	13	65	19	0	4	68	12	1
2:00 PM	19	85	45	2	33	78	14	2	8	73	11	0	9	68	13	2
2:15 PM	17	64	52	1	56	69	18	0	16	54	21	0	10	60	14	0
2:30 PM	11	82	64	3	53	79	14	2	23	62	20	0	9	79	13	1
2:45 PM	10	60	64	2	39	78	12	0	15	62	20	0	10	87	18	2

	Broadway Southbound				McArthur Blvd Westbound				Broadway Northbound				McArthur Blvd Eastbound					
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	15-Min Total	Hour Total
11:00 AM	16	72	33	1	62	90	22	0	20	55	14	0	7	67	11	1	471	1958
11:15 AM	13	56	39	1	80	100	15	1	19	66	16	0	6	56	12	1	481	2052
11:30 AM	12	59	52	1	71	102	26	1	14	44	23	0	10	69	13	0	497	2101
11:45 AM	15	84	45	0	81	97	14	1	13	59	7	1	7	70	15	0	509	2179
12:00 PM	24	90	67	2	77	91	13	1	11	79	21	0	6	65	15	3	565	2232
12:15 PM	11	84	62	1	90	91	29	0	11	60	16	0	7	53	14	1	530	2284
12:30 PM	13	109	59	3	70	96	21	0	17	79	20	0	7	68	13	0	575	2286
12:45 PM	12	75	52	2	102	95	16	0	11	76	19	1	9	74	17	1	562	2281
1:00 PM	16	113	63	4	85	82	26	1	4	93	27	0	17	70	13	3	617	2254
1:15 PM	19	94	70	1	58	77	13	2	10	82	12	0	7	62	21	4	532	2105
1:30 PM	21	101	78	1	57	89	14	0	19	76	19	2	7	71	12	3	570	2029
1:45 PM	22	96	74	0	68	77	11	1	13	66	19	0	4	71	12	1	535	1981
2:00 PM	19	87	46	2	35	78	15	2	8	73	11	0	9	68	13	2	468	1932
2:15 PM	17	64	52	1	56	70	18	0	17	56	21	0	10	60	14	0	456	
2:30 PM	11	83	65	3	54	82	14	2	23	63	20	0	9	79	13	1	522	
2:45 PM	11	61	64	2	40	78	12	0	16	62	20	0	10	89	19	2	486	
Peak Hour	**68**	**383**	**263**	**8**	**302**	**343**	**69**	**3**	**44**	**327**	**77**	**3**	**40**	**277**	**63**	**11**	**0.92**	

Truck

Study Name **WC10-2728_10 Broadway/W MacArthur Blvd**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound				Westbound Street Westbound				Northbound Street Northbound				Eastbound Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	1	1	1	0	2	0	0	0	0	1	0	0	0	3	0	0
11:15 AM	0	1	1	0	1	1	0	0	1	2	0	0	0	0	0	0
11:30 AM	1	2	2	0	3	1	1	0	1	0	0	0	0	0	0	0
11:45 AM	0	3	0	0	0	2	0	0	2	2	0	0	0	1	1	0
12:00 PM	0	2	4	0	1	2	0	0	0	1	0	0	0	0	0	0
12:15 PM	0	1	1	0	0	2	0	0	0	2	0	0	0	0	0	0
12:30 PM	1	1	0	0	2	1	0	0	1	3	0	0	0	0	0	0
12:45 PM	0	1	0	0	3	0	0	0	0	3	1	0	1	3	0	0
1:00 PM	0	1	2	0	1	0	0	0	0	1	0	0	0	0	1	0
1:15 PM	0	1	2	0	1	5	0	0	0	2	0	0	0	2	1	0
1:30 PM	0	1	3	0	1	2	0	0	1	0	0	0	0	1	0	0
1:45 PM	0	2	1	0	2	1	0	0	0	1	0	0	0	3	0	0
2:00 PM	0	2	1	0	2	0	1	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	1	0	0	1	2	0	0	0	0	0	0
2:30 PM	0	1	1	0	1	3	0	0	0	1	0	0	0	0	0	0
2:45 PM	1	1	0	0	1	0	0	0	1	0	0	0	0	2	1	0
Peak Hour	**0**	**4**	**7**	**0**	**6**	**7**	**0**	**0**	**1**	**6**	**1**	**0**	**1**	**6**	**2**	**0**

Pedal Bike (Road)

Study Name **WC10-2728_10 Broadway/W MacArthur Blvd**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound				Westbound Street Westbound				Northbound Street Northbound				Eastbound Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	0	1	0	0	0	3	0	0	0	2	0	0	0	1	0	0
11:15 AM	0	3	0	0	1	1	0	0	0	2	0	0	1	0	0	0
11:30 AM	0	2	0	0	0	2	0	0	0	4	0	0	0	0	0	0
11:45 AM	0	2	0	0	0	0	1	0	0	3	1	0	0	0	0	0
12:00 PM	0	4	0	0	0	2	0	0	0	3	0	0	2	0	0	0
12:15 PM	0	3	0	0	0	1	0	0	0	1	0	0	1	0	0	0
12:30 PM	0	0	1	0	2	1	2	0	0	3	0	0	1	2	0	0
12:45 PM	0	2	0	0	0	0	0	0	0	2	0	0	1	0	0	0
1:00 PM	0	3	0	0	0	1	0	0	0	0	1	0	1	2	0	0
1:15 PM	0	3	0	0	0	4	0	0	0	5	1	0	0	0	0	0
1:30 PM	0	3	0	0	0	1	0	0	0	4	4	0	0	4	1	0
1:45 PM	0	2	0	0	0	0	0	0	0	3	1	0	0	0	0	1
2:00 PM	0	1	0	0	0	1	0	0	0	0	2	0	1	3	0	0
2:15 PM	0	3	0	0	1	2	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0
2:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0
Peak Hour	**0**	**11**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**11**	**6**	**0**	**2**	**6**	**1**	**0**

People

Study Name **WC10-2728_10 Broadway/W MacArthur Blvd**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound		Westbound Street Westbound		Northbound Street Northbound		Eastbound Street Eastbound			
Start Time	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW		
11:00 AM	14	31	1	0	0	0	5	5		
11:15 AM	7	13	0	2	0	0	5	6		
11:30 AM	14	17	0	0	0	0	8	3		
11:45 AM	19	16	0	0	0	0	14	7		
12:00 PM	11	10	0	1	1	1	1	5		
12:15 PM	9	12	0	0	0	0	6	1		
12:30 PM	14	9	0	0	1	0	8	5		
12:45 PM	17	1	2	0	2	0	5	2		
1:00 PM	19	3	0	0	0	0	6	3		
1:15 PM	11	5	0	0	0	0	6	4		
1:30 PM	15	1	0	0	0	0	12	4		
1:45 PM	14	4	0	0	0	0	1	1		
2:00 PM	10	15	0	0	0	0	7	5		
2:15 PM	9	4	0	0	0	0	12	5		
2:30 PM	17	2	0	0	0	0	11	6		
2:45 PM	10	11	0	0	1	0	7	5		
Peak Hour	**62**	**10**	**2**	**0**	**2**	**0**	**29**	**13**	**0**	**0**
	72		2		2		42			

Pedal Bike (Crosswalk)

Study Name **WC10-2728_10 Broadway/W MacArthur Blvd**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound		Westbound Street Westbound		Northbound Street Northbound		Eastbound Street Eastbound									
Start Time	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW								
11:00 AM	1	0	0	0	0	0	0	0								
11:15 AM	0	0	0	0	0	0	0	0								
11:30 AM	0	0	0	0	0	0	0	0								
11:45 AM	0	0	0	0	0	0	0	0								
12:00 PM	0	0	0	0	0	0	0	0								
12:15 PM	0	0	0	0	0	0	0	0								
12:30 PM	0	0	0	0	0	0	0	0								
12:45 PM	0	0	0	0	0	0	0	0								
1:00 PM	0	1	0	0	0	0	0	0								
1:15 PM	0	1	0	0	0	0	0	0								
1:30 PM	0	0	0	0	0	0	0	0								
1:45 PM	1	0	0	0	0	0	0	0								
2:00 PM	0	1	0	0	0	0	0	0								
2:15 PM	0	0	0	0	1	0	0	0								
2:30 PM	0	0	0	0	0	0	0	0								
2:45 PM	0	0	0	0	0	0	0	0								
Peak Hour	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Totals

Study Name **WC10-2728_10 Broadway/W MacArthur Blvd**
Start Date **10/27/2012**
Start Time **11:00 AM**
Site Code

	Southbound Street Southbound				Westbound Street Westbound				Northbound Street Northbound				Eastbound Street Eastbound			
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn
11:00 AM	16	73	33	1	62	93	22	0	20	57	14	0	7	68	11	1
11:15 AM	13	59	39	1	81	101	15	1	19	68	16	0	7	56	12	1
11:30 AM	12	61	52	1	71	104	26	1	14	48	23	0	10	69	13	0
11:45 AM	15	86	45	0	81	97	15	1	13	62	8	1	7	70	15	0
12:00 PM	24	94	67	2	77	93	13	1	11	82	21	0	8	65	15	3
12:15 PM	11	87	62	1	90	92	29	0	11	61	16	0	8	53	14	1
12:30 PM	13	109	60	3	72	97	23	0	17	82	20	0	8	70	13	0
12:45 PM	12	77	52	2	102	95	16	0	11	78	19	1	10	74	17	1
1:00 PM	16	116	63	4	85	83	26	1	4	93	28	0	18	72	13	3
1:15 PM	19	97	70	1	58	81	13	2	10	87	13	0	7	62	21	4
1:30 PM	21	104	78	1	57	90	14	0	19	80	23	2	7	75	13	3
1:45 PM	22	98	74	0	68	77	11	1	13	69	20	0	4	71	12	2
2:00 PM	19	88	46	2	35	79	15	2	8	73	13	0	10	71	13	2
2:15 PM	17	67	52	1	57	72	18	0	17	56	21	0	10	60	14	0
2:30 PM	11	83	65	3	56	84	14	2	23	64	21	0	9	79	13	1
2:45 PM	11	61	64	2	40	79	12	0	16	62	20	0	10	91	19	2
Peak Hour	**68**	**394**	**263**	**8**	**302**	**349**	**69**	**3**	**44**	**338**	**83**	**3**	**42**	**283**	**64**	**11**

MARKS TRAFFIC DATA

CITY OF OAKLAND

fp
Mietek 916-806-0250

File Name : broadway-macarthur-s
Site Code : 10
Start Date : 5/8/2010
Page No : 1

Groups Printed- Vehicles Only

	BROADWAY Southbound				MacARTHUR BLVD Westbound				BROADWAY Northbound				MacARTHUR BLVD Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
16:00	15	60	61	136	28	79	9	116	11	42	10	63	11	90	10	111	426
16:15	19	64	52	135	44	79	14	137	14	71	12	97	12	78	13	103	472
16:30	12	50	34	96	24	50	6	80	12	54	9	75	3	55	15	73	324
16:45	13	62	55	130	32	75	14	121	16	79	24	119	8	77	9	94	464
Total	59	236	202	497	128	283	43	454	53	246	55	354	34	300	47	381	1686
17:00	10	54	53	117	33	82	13	128	14	59	14	87	16	89	16	121	453
17:15	10	73	46	129	33	66	15	114	14	66	15	95	7	71	9	87	425
17:30	16	65	43	124	39	72	4	115	17	60	12	89	8	70	13	91	419
17:45	17	57	32	106	39	65	8	112	11	53	7	71	10	81	19	110	399
Total	53	249	174	476	144	285	40	469	56	238	48	342	41	311	57	409	1696
18:00	9	76	35	120	33	56	9	98	8	53	19	80	8	56	10	74	372
18:15	13	56	41	110	34	76	4	114	7	56	13	76	3	67	8	78	378
18:30	10	58	50	118	27	53	4	84	7	48	7	62	7	61	5	73	337
18:45	11	51	39	101	35	66	6	107	10	52	14	76	3	70	13	86	370
Total	43	241	165	449	129	251	23	403	32	209	53	294	21	254	36	311	1457
Grand Total	155	726	541	1422	401	819	106	1326	141	693	156	990	96	865	140	1101	4839
Apprch %	10.9	51.1	38		30.2	61.8	8		14.2	70	15.8		8.7	78.6	12.7		
Total %	3.2	15	11.2	29.4	8.3	16.9	2.2	27.4	2.9	14.3	3.2	20.5	2	17.9	2.9	22.8	

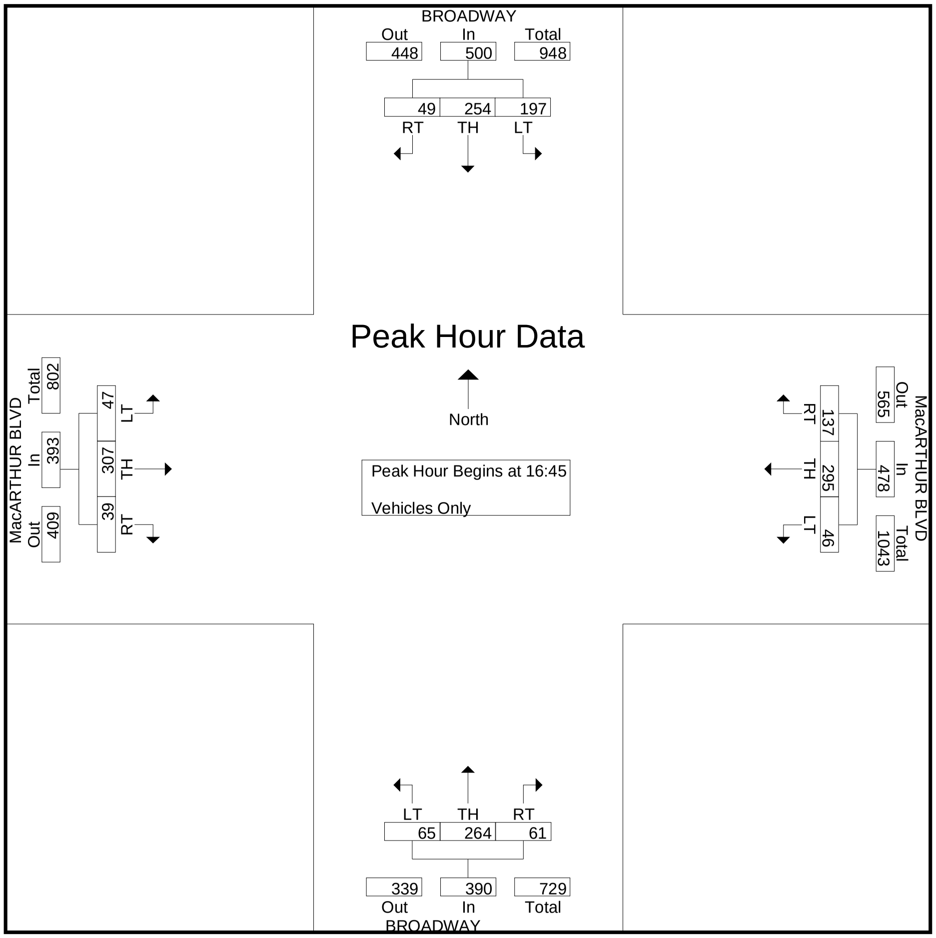
	BROADWAY Southbound				MacARTHUR BLVD Westbound				BROADWAY Northbound				MacARTHUR BLVD Eastbound				
Start Time	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	RT	TH	LT	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 18:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	13	62	**55**	**130**	32	75	14	121	16	**79**	**24**	**119**	8	77	9	94	**464**
17:00	10	54	53	117	33	**82**	13	**128**	14	59	14	87	**16**	**89**	**16**	**121**	453
17:15	10	**73**	46	129	33	66	**15**	114	14	66	15	95	7	71	9	87	425
17:30	**16**	65	43	124	**39**	72	4	115	**17**	60	12	89	8	70	13	91	419
Total Volume	49	254	197	500	137	295	46	478	61	264	65	390	39	307	47	393	1761
% App. Total	9.8	50.8	39.4		28.7	61.7	9.6		15.6	67.7	16.7		9.9	78.1	12		
PHF	.766	.870	.895	.962	.878	.899	.767	.934	.897	.835	.677	.819	.609	.862	.734	.812	.949

MARKS TRAFFIC DATA

CITY OF OAKLAND

fp
Mietek 916-806-0250

File Name : broadway-macarthur-s
Site Code : 10
Start Date : 5/8/2010
Page No : 2



Traffic Data Service
Campbell, CA
(408) 377-2988
tdsbay@cs.com

File Name : 5AM FINAL
Site Code : 00000005
Start Date : 3/12/2009
Page No : 1

Groups Printed- Vehicles

	PIEDMONT AVE Southbound					MacARTHUR BLVD Westbound					PIEDMONT AVE Northbound					MacARTHUR BLVD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	2	11	19	6	38	19	151	34	2	206	10	7	4	4	25	6	55	3	4	68	337
07:15 AM	5	22	36	6	69	22	160	27	2	211	9	24	5	10	48	16	48	6	9	79	407
07:30 AM	11	34	36	12	93	31	156	39	5	231	19	21	9	9	58	12	89	5	6	112	494
07:45 AM	9	38	44	11	102	30	230	62	12	334	29	18	4	10	61	19	106	5	16	146	643
Total	27	105	135	35	302	102	697	162	21	982	67	70	22	33	192	53	298	19	35	405	1881
08:00 AM	14	55	53	4	126	29	221	46	6	302	16	32	9	12	69	11	106	7	19	143	640
08:15 AM	14	31	69	7	121	41	251	57	4	353	21	23	7	12	63	16	135	8	21	180	717
08:30 AM	16	50	58	4	128	35	224	55	4	318	32	36	14	17	99	18	102	14	11	145	690
08:45 AM	21	56	47	5	129	40	246	61	10	357	24	18	13	14	69	7	97	12	18	134	689
Total	65	192	227	20	504	145	942	219	24	1330	93	109	43	55	300	52	440	41	69	602	2736
Grand Total	92	297	362	55	806	247	1639	381	45	2312	160	179	65	88	492	105	738	60	104	1007	4617
Apprch %	11.4	36.8	44.9	6.8		10.7	70.9	16.5	1.9		32.5	36.4	13.2	17.9		10.4	73.3	6	10.3		
Total %	2	6.4	7.8	1.2	17.5	5.3	35.5	8.3	1	50.1	3.5	3.9	1.4	1.9	10.7	2.3	16	1.3	2.3	21.8	

	PIEDMONT AVE Southbound					MacARTHUR BLVD Westbound					PIEDMONT AVE Northbound					MacARTHUR BLVD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	14	55	53	4	126	29	221	46	6	302	16	32	9	12	69	11	106	7	19	143	640
08:15 AM	14	31	69	7	121	41	251	57	4	353	21	23	7	12	63	16	135	8	21	180	717
08:30 AM	16	50	58	4	128	35	224	55	4	318	32	36	14	17	99	18	102	14	11	145	690
08:45 AM	21	56	47	5	129	40	246	61	10	357	24	18	13	14	69	7	97	12	18	134	689
Total Volume	65	192	227	20	504	145	942	219	24	1330	93	109	43	55	300	52	440	41	69	602	2736
% App. Total	12.9	38.1	45	4		10.9	70.8	16.5	1.8		31	36.3	14.3	18.3		8.6	73.1	6.8	11.5		
PHF	.774	.857	.822	.714	.977	.884	.938	.898	.600	.931	.727	.757	.768	.809	.758	.722	.815	.732	.821	.836	.954

Traffic Data Service
Campbell, CA
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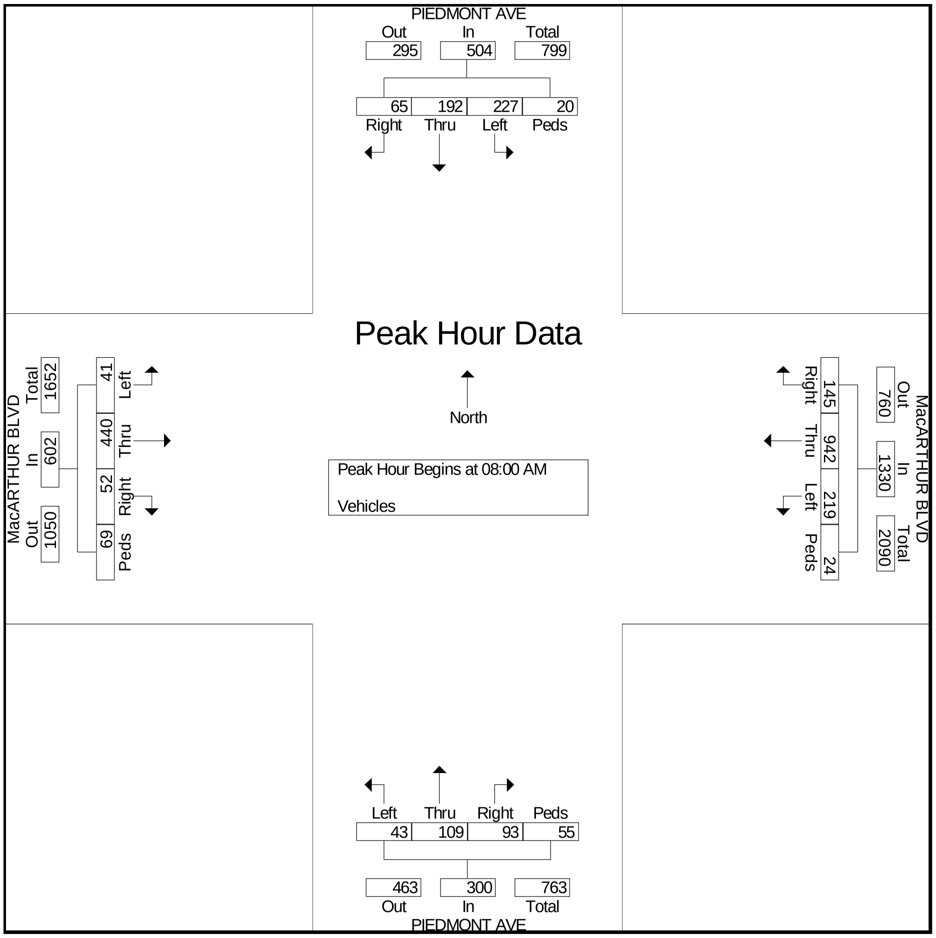
File Name : 5AM FINAL
Site Code : 00000005
Start Date : 3/12/2009
Page No : 2



Traffic Data Service
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(408) 377-2988
tdsbay@cs.com

File Name : 5PM FINAL
Site Code : 00000005
Start Date : 3/12/2009
Page No : 1

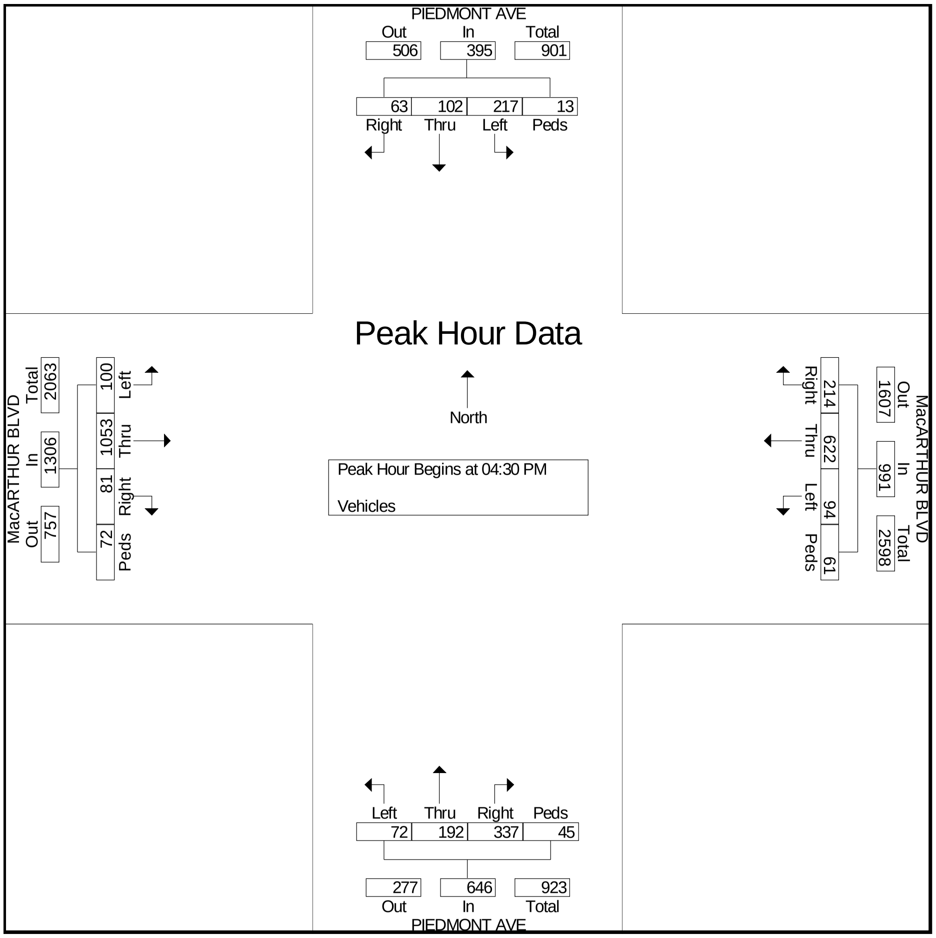
Groups Printed- Vehicles

	PIEDMONT AVE Southbound					MacARTHUR BLVD Westbound					PIEDMONT AVE Northbound					MacARTHUR BLVD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	11	18	59	10	98	43	163	23	11	240	82	69	31	13	195	13	221	26	17	277	810
04:15 PM	16	19	57	7	99	54	155	26	21	256	81	45	16	9	151	11	195	19	14	239	745
04:30 PM	10	19	48	5	82	50	152	24	21	247	96	47	20	8	171	13	271	27	19	330	830
04:45 PM	20	22	57	3	102	56	158	26	11	251	75	36	18	9	138	16	248	20	15	299	790
Total	57	78	221	25	381	203	628	99	64	994	334	197	85	39	655	53	935	92	65	1145	3175
05:00 PM	17	28	58	4	107	49	138	24	15	226	98	61	16	15	190	16	260	28	24	328	851
05:15 PM	16	33	54	1	104	59	174	20	14	267	68	48	18	13	147	36	274	25	14	349	867
05:30 PM	10	20	44	4	78	28	183	10	13	234	77	50	16	17	160	11	266	23	17	317	789
05:45 PM	12	29	54	1	96	63	162	24	7	256	64	47	18	5	134	12	259	25	5	301	787
Total	55	110	210	10	385	199	657	78	49	983	307	206	68	50	631	75	1059	101	60	1295	3294
Grand Total	112	188	431	35	766	402	1285	177	113	1977	641	403	153	89	1286	128	1994	193	125	2440	6469
Apprch %	14.6	24.5	56.3	4.6		20.3	65	9	5.7		49.8	31.3	11.9	6.9		5.2	81.7	7.9	5.1		
Total %	1.7	2.9	6.7	0.5	11.8	6.2	19.9	2.7	1.7	30.6	9.9	6.2	2.4	1.4	19.9	2	30.8	3	1.9	37.7	

	PIEDMONT AVE Southbound					MacARTHUR BLVD Westbound					PIEDMONT AVE Northbound					MacARTHUR BLVD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	10	19	48	5	82	50	152	24	21	247	96	47	20	8	171	13	271	27	19	330	830
04:45 PM	20	22	57	3	102	56	158	26	11	251	75	36	18	9	138	16	248	20	15	299	790
05:00 PM	17	28	58	4	107	49	138	24	15	226	98	61	16	15	190	16	260	28	24	328	851
05:15 PM	16	33	54	1	104	59	174	20	14	267	68	48	18	13	147	36	274	25	14	349	867
Total Volume	63	102	217	13	395	214	622	94	61	991	337	192	72	45	646	81	1053	100	72	1306	3338
% App. Total																					
PHF	.788	.773	.935	.650	.923	.907	.894	.904	.726	.928	.860	.787	.900	.750	.850	.563	.961	.893	.750	.936	.963

Traffic Data Service
Campbell, CA
(408) 377-2988
tdsbay@cs.com

File Name : 5PM FINAL
Site Code : 00000005
Start Date : 3/12/2009
Page No : 2



Study Name WC09-2618 -- Piedmont Ave/MacArthur Blvd
Start Date Saturday, December 01, 2012 12:00 PM
End Date Saturday, December 01, 2012 4:00 PM
Site Code

Report Summary

		Southbound						Westbound						Northbound						Eastbound								Crosswalk		
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Peopleike (Cro		Total
Peak 1	Car	78	73	196	1	348	412	208	521	48	4	781	925	151	136	39	0	326	144	23	574	67	6	670	644	2125	SB	33	0	33
Specified Period	%	100%	100%	99%	100%	99%	100%	100%	100%	100%	100%	100%	100%	100%	99%	100%	0%	100%	99%	92%	100%	100%	100%	100%	100%	100%		100%	0%	
12:00 PM - 4:00 PM	ɘdal Bike (Roa	0	0	1	0	1	1	0	0	0	0	0	2	0	1	0	0	1	1	1	1	0	0	2	0	4	WB	67	0	67
One Hour Peak	%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%		100%	0%	
1:15 PM - 2:15 PM	Motor Bike	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	2	NB	0	0	0
	%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%		0%	0%	
	Total	**78**	**73**	**198**	**1**	**350**	**413**	**208**	**521**	**48**	**4**	**781**	**928**	**151**	**137**	**39**	**0**	**327**	**146**	**25**	**575**	**67**	**6**	**673**	**644**	**2131**	EB	0	0	0
	PHF	0.85	0.7	0.82	0.25	0.86	0.9	0.98	0.79	0.75	0.5	0.83	0.95	0.84	0.71	0.75	0	0.77	0.81	0.89	0.94	0.76	0.75	0.95	0.84	0.94		0%	0%	
	Approach %					16%	19%					37%	44%					15%	7%					32%	30%			**100**	**0**	**100**

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-034 BROADWAY-HAWTHORNE-F
Site Code : 00000000
Start Date : 11/13/2008
Page No : 1

Groups Printed- Unshifted

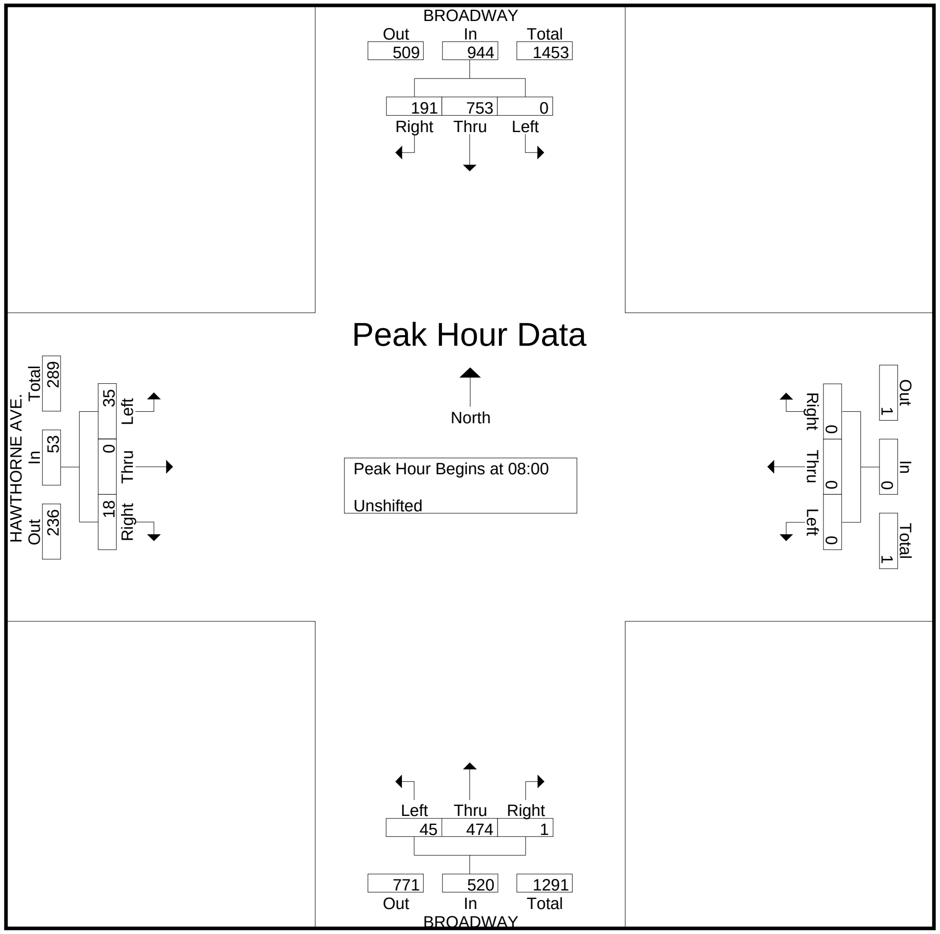
	BROADWAY Southbound					Westbound					BROADWAY Northbound					HAWTHORNE AVE. Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	0	66	28	0	94	0	0	0	0	0	5	54	0	0	59	5	0	2	0	7	0	160	160
07:15	0	87	33	0	120	0	0	0	0	0	5	70	0	4	75	2	0	4	3	6	7	201	208
07:30	2	124	40	0	166	0	0	0	0	0	6	69	0	0	75	5	0	3	0	8	0	249	249
07:45	0	148	46	0	194	0	0	0	0	0	11	104	0	1	115	8	0	3	1	11	2	320	322
Total	2	425	147	0	574	0	0	0	0	0	27	297	0	5	324	20	0	12	4	32	9	930	939
08:00	0	153	45	0	198	0	0	0	0	0	12	106	0	5	118	11	0	6	4	17	9	333	342
08:15	0	190	44	0	234	0	0	0	0	0	12	125	1	2	138	10	0	4	1	14	3	386	389
08:30	0	219	49	0	268	0	0	0	0	0	13	136	0	4	149	5	0	3	7	8	11	425	436
08:45	0	191	53	0	244	0	0	0	0	0	8	107	0	3	115	9	0	5	2	14	5	373	378
Total	0	753	191	0	944	0	0	0	0	0	45	474	1	14	520	35	0	18	14	53	28	1517	1545
*** BREAK ***																							
16:00	0	190	36	0	226	0	0	0	0	0	15	188	0	4	203	26	0	8	4	34	8	463	471
16:15	0	156	25	3	181	0	0	0	0	0	10	191	0	2	201	32	0	5	5	37	10	419	429
16:30	0	193	24	1	217	0	0	0	0	0	6	213	0	1	219	33	0	9	3	42	5	478	483
16:45	0	196	39	0	235	0	0	0	0	0	7	204	0	9	211	40	0	13	6	53	15	499	514
Total	0	735	124	4	859	0	0	0	0	0	38	796	0	16	834	131	0	35	18	166	38	1859	1897
17:00	0	187	26	1	213	0	0	0	0	0	4	233	0	2	237	49	0	4	1	53	4	503	507
17:15	0	190	26	1	216	0	0	0	0	0	6	222	0	2	228	39	0	5	5	44	8	488	496
17:30	0	193	17	0	210	0	0	0	0	0	9	221	0	0	230	27	0	6	1	33	1	473	474
17:45	0	181	16	0	197	0	0	0	0	0	10	207	0	1	217	26	0	7	6	33	7	447	454
Total	0	751	85	2	836	0	0	0	0	0	29	883	0	5	912	141	0	22	13	163	20	1911	1931
Grand Total	2	2664	547	6	3213	0	0	0	0	0	139	2450	1	40	2590	327	0	87	49	414	95	6217	6312
Apprch %	0.1	82.9	17			0	0	0			5.4	94.6	0			79	0	21					
Total %	0	42.9	8.8		51.7	0	0	0		0	2.2	39.4	0		41.7	5.3	0	1.4		6.7	1.5	98.5	

	BROADWAY Southbound				Westbound				BROADWAY Northbound				HAWTHORNE AVE. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	0	153	45	198	0	0	0	0	12	106	0	118	**11**	0	**6**	**17**	333
08:15	0	190	44	234	0	0	0	0	12	125	**1**	138	10	0	4	14	386
08:30	0	**219**	49	**268**	0	0	0	0	**13**	**136**	0	**149**	5	0	3	8	**425**
08:45	0	191	**53**	244	0	0	0	0	8	107	0	115	9	0	5	14	373
Total Volume	0	753	191	944	0	0	0	0	45	474	1	520	35	0	18	53	1517
% App. Total	0	79.8	20.2		0	0	0		8.7	91.2	0.2		66	0	34		
PHF	.000	.860	.901	.881	.000	.000	.000	.000	.865	.871	.250	.872	.795	.000	.750	.779	.892

All Traffic Data
(916) 771-8700
F (916) 786-2879

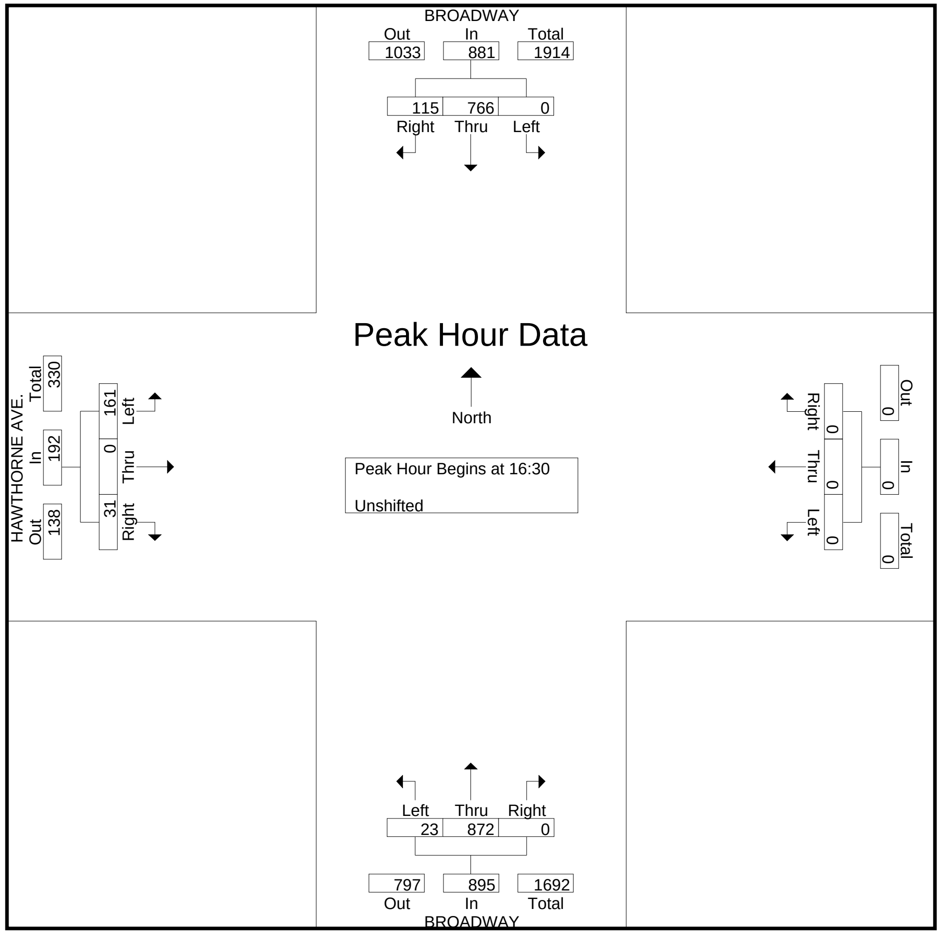
OAKLAND

File Name : 08-7650-034 BROADWAY-HAWTHORNE-F
Site Code : 00000000
Start Date : 11/13/2008



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:30

16:30	0	193	24	217	0	0	0	0	6	213	0	219	33	0	9	42	478
16:45	0	**196**	**39**	**235**	0	0	0	0	**7**	204	0	211	40	0	**13**	**53**	499
17:00	0	187	26	213	0	0	0	0	4	**233**	0	**237**	**49**	0	4	53	**503**
17:15	0	190	26	216	0	0	0	0	6	222	0	228	39	0	5	44	488
Total Volume	0	766	115	881	0	0	0	0	23	872	0	895	161	0	31	192	1968
% App. Total	0	86.9	13.1		0	0	0		2.6	97.4	0		83.9	0	16.1		
PHF	.000	.977	.737	.937	.000	.000	.000	.000	.821	.936	.000	.944	.821	.000	.596	.906	.978



BROADWAY
Out 1033
In 881
Total 1914
Right 115
Thru 766
Left 0
Peak Hour Data
North
Peak Hour Begins at 16:30
Unshifted
HAWTHORNE AVE.
Total 330
In 192
Out 138
Left 161
Thru 0
Right 31
Right 0
Thru 0
Left 0
Out 0
In 0
Total 0
Left 23
Thru 872
Right 0
Out 797
In 895
Total 1692
BROADWAY

All Traffic Data
(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-035 BROADWAY-PIEDMONT-F
Site Code : 00000000
Start Date : 11/13/2008
Page No : 1

Groups Printed- Unshifted

	BROADWAY Southbound					PIEDMONT AVE. Westbound					BROADWAY Northbound					Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	14	59	0	3	73	33	0	7	1	40	0	36	24	0	60	0	0	0	0	0	4	173	177
07:15	33	82	0	3	115	38	0	4	1	42	0	53	22	0	75	0	0	0	0	0	4	232	236
07:30	19	104	0	1	123	65	0	7	2	72	0	49	27	0	76	0	0	0	0	0	3	271	274
07:45	21	122	0	1	143	69	0	10	2	79	0	72	34	0	106	0	0	0	0	0	3	328	331
Total	87	367	0	8	454	205	0	28	6	233	0	210	107	0	317	0	0	0	0	0	14	1004	1018
08:00	20	133	0	0	153	63	0	13	0	76	0	82	32	0	114	0	0	0	0	0	0	343	343
08:15	18	169	0	0	187	77	0	9	3	86	0	102	41	0	143	0	0	0	0	0	3	416	419
08:30	38	186	0	8	224	82	0	5	1	87	0	89	47	0	136	0	0	0	0	0	9	447	456
08:45	19	171	0	0	190	81	0	5	3	86	0	82	37	0	119	0	0	0	0	0	3	395	398
Total	95	659	0	8	754	303	0	32	7	335	0	355	157	0	512	0	0	0	0	0	15	1601	1616
*** BREAK ***																							
16:00	26	163	0	4	189	63	0	17	3	80	0	136	87	0	223	0	0	0	0	0	7	492	499
16:15	28	128	0	3	156	55	0	19	5	74	0	132	85	0	217	0	0	0	0	0	8	447	455
16:30	20	170	0	5	190	52	0	12	1	64	0	150	95	0	245	0	0	0	0	0	6	499	505
16:45	21	171	0	11	192	66	0	14	3	80	0	155	98	0	253	0	0	0	0	0	14	525	539
Total	95	632	0	23	727	236	0	62	12	298	0	573	365	0	938	0	0	0	0	0	35	1963	1998
17:00	24	166	0	2	190	50	0	19	8	69	0	191	102	0	293	0	0	0	0	0	10	552	562
17:15	31	160	0	8	191	57	0	23	2	80	0	187	79	1	266	0	0	0	0	0	11	537	548
17:30	33	147	0	2	180	61	0	13	0	74	0	176	77	0	253	0	0	0	0	0	2	507	509
17:45	30	151	0	4	181	42	0	12	3	54	0	161	73	0	234	0	0	0	0	0	7	469	476
Total	118	624	0	16	742	210	0	67	13	277	0	715	331	1	1046	0	0	0	0	0	30	2065	2095
Grand Total	395	2282	0	55	2677	954	0	189	38	1143	0	1853	960	1	2813	0	0	0	0	0	94	6633	6727
Apprch %	14.8	85.2	0			83.5	0	16.5			0	65.9	34.1			0	0	0					
Total %	6	34.4	0		40.4	14.4	0	2.8		17.2	0	27.9	14.5		42.4	0	0	0		0	1.4	98.6	

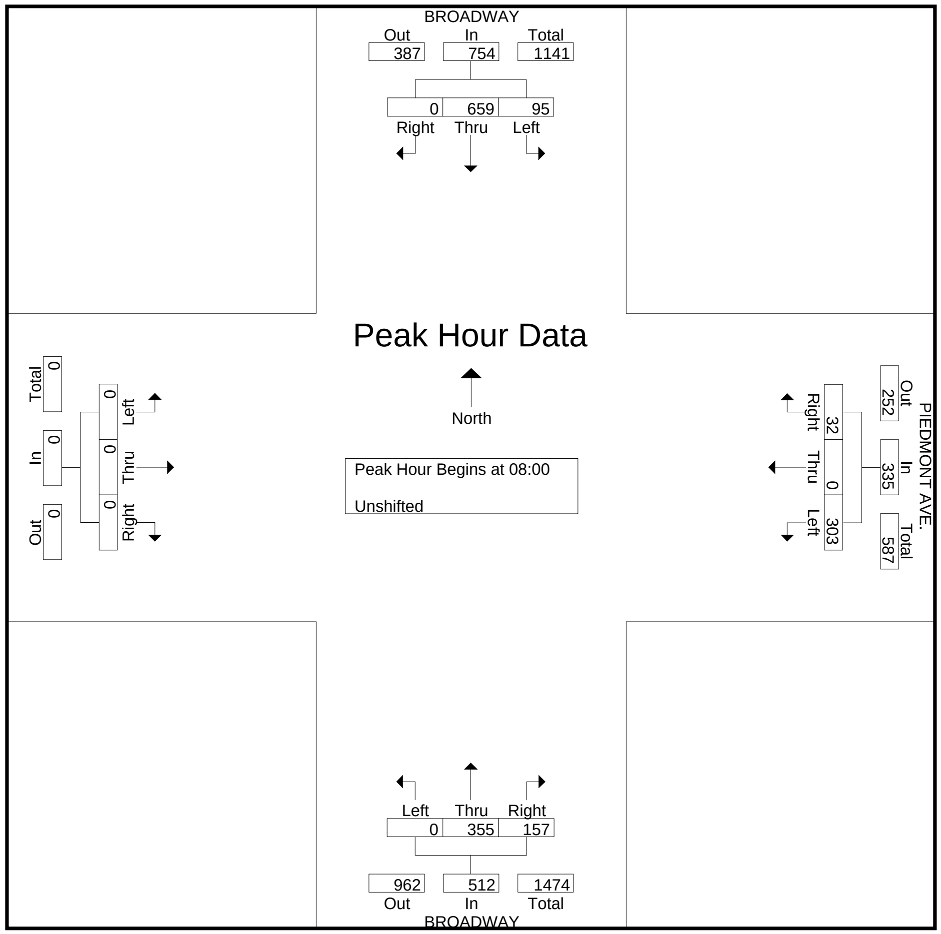
	BROADWAY Southbound				PIEDMONT AVE. Westbound				BROADWAY Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	20	133	0	153	63	0	**13**	76	0	82	32	114	0	0	0	0	343
08:15	18	169	0	187	77	0	9	86	0	**102**	41	**143**	0	0	0	0	416
08:30	**38**	**186**	0	**224**	**82**	0	5	**87**	0	89	**47**	136	0	0	0	0	**447**
08:45	19	171	0	190	81	0	5	86	0	82	37	119	0	0	0	0	395
Total Volume	95	659	0	754	303	0	32	335	0	355	157	512	0	0	0	0	1601
% App. Total	12.6	87.4	0		90.4	0	9.6		0	69.3	30.7		0	0	0		
PHF	.625	.886	.000	.842	.924	.000	.615	.963	.000	.870	.835	.895	.000	.000	.000	.000	.895

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-035 BROADWAY-PIEDMONT-F
Site Code : 00000000
Start Date : 11/13/2008
Page No : 2

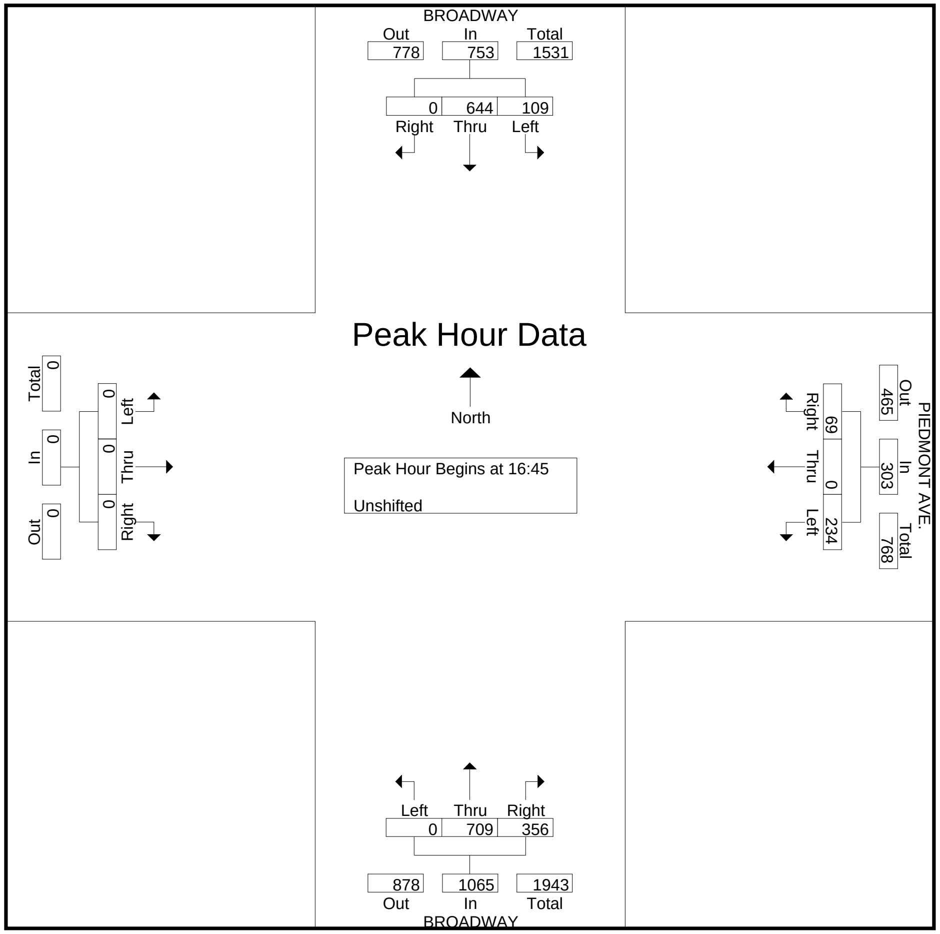


Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

16:45	21	**171**	0	**192**	**66**	0	14	**80**	0	155	98	253	0	0	0	0	525
17:00	24	166	0	190	50	0	19	69	0	**191**	**102**	**293**	0	0	0	0	**552**
17:15	31	160	0	191	57	0	**23**	80	0	187	79	266	0	0	0	0	537
17:30	**33**	147	0	180	61	0	13	74	0	176	77	253	0	0	0	0	507
Total Volume	109	644	0	753	234	0	69	303	0	709	356	1065	0	0	0	0	2121
% App. Total	14.5	85.5	0		77.2	0	22.8		0	66.6	33.4		0	0	0		
PHF	.826	.942	.000	.980	.886	.000	.750	.947	.000	.928	.873	.909	.000	.000	.000	.000	.961

OAKLAND

File Name : 08-7650-035 BROADWAY-PIEDMONT-F
Site Code : 00000000
Start Date : 11/13/2008
Page No : 3



Study Name	WC09-2618 -- Broadway/Piedmont Ave
Start Date	Saturday, November 10, 2012 12:00 PM
End Date	Saturday, November 10, 2012 4:15 PM
Site Code	

Report Summary

		Southbound					Westbound					Northbound						Crosswalk			
Time Period	Class.	T	L	U	I	O	R	L	U	I	O	R	T	U	I	O	Total		Peopleike (Crc		Total
Peak 1	Car	438	52	12	502	410	16	110	0	126	227	175	382	0	557	548	1185	SB	6	1	7
Specified Period	%	94%	96%	100%	95%	94%	94%	92%	0%	92%	93%	92%	93%	0%	93%	94%	94%		86%	14%	
12:00 PM - 4:15 PM	Truck	6	2	0	8	11	0	3	0	3	5	3	11	0	14	9	25	WB	8	1	9
One Hour Peak	%	1%	4%	0%	2%	3%	0%	3%	0%	2%	2%	2%	3%	0%	2%	2%	2%		89%	11%	
1:00 PM - 2:00 PM	edal Bike (Roa	19	0	0	19	15	1	7	0	8	12	12	14	0	26	26	53	NB	0	0	0
	%	4%	0%	0%	4%	3%	6%	6%	0%	6%	5%	6%	3%	0%	4%	4%	4%		0%	0%	
	Motor Bike	1	0	0	1	2	0	0	0	0	1	1	2	0	3	1	4		**14**	**2**	**16**
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%				
	Total	**464**	**54**	**12**	**530**	**438**	**17**	**120**	**0**	**137**	**245**	**191**	**409**	**0**	**600**	**584**	**1267**				
	PHF	0.91	0.79	0.43	0.94	0.82	0.85	0.88	0	0.9	0.93	0.88	0.84	0	0.87	0.91	0.93				
	Approach %				42%	35%				11%	19%				47%	46%					

Study Name WC09-2618 -- Broadway/Hawthorne Ave, Brook St
Start Date Saturday, November 10, 2012 12:00 PM
End Date Saturday, November 10, 2012 4:00 PM
Site Code

Report Summary

		Southbound						Westbound						Northbound						Eastbound								Crosswalk		
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Peopleike (Cro		Total
Peak 1	Car	33	476	2	1	512	555	16	1	0	0	17	8	6	508	25	1	540	495	18	0	30	0	48	59	1117	SB	1	0	1
Specified Period	%	92%	92%	67%	100%	92%	93%	100%	100%	0%	0%	100%	89%	100%	93%	89%	50%	93%	92%	95%	0%	100%	0%	98%	91%	93%		100%	0%	
12:00 PM - 4:00 PM	Truck	0	10	0	0	10	8	0	0	0	0	0	0	0	8	3	0	11	10	0	0	0	0	0	3	21	WB	18	4	22
One Hour Peak	%	0%	2%	0%	0%	2%	1%	0%	0%	0%	0%	0%	0%	0%	1%	11%	0%	2%	2%	0%	0%	0%	0%	0%	5%	2%		82%	18%	
12:30 PM - 1:30 PM	ɘdal Bike (Roa	3	28	1	0	32	31	0	0	0	0	0	1	0	31	0	0	31	29	1	0	0	0	1	3	64	NB	6	0	6
	%	8%	5%	33%	0%	6%	5%	0%	0%	0%	0%	0%	11%	0%	6%	0%	0%	5%	5%	5%	0%	0%	0%	2%	5%	5%		100%	0%	
	Motor Bike	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	3	0	0	0	0	0	0	3	EB	17	4	21
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	1%	0%	0%	0%	0%	0%	0%	0%		81%	19%	
	Total	**36**	**516**	**3**	**1**	**556**	**594**	**16**	**1**	**0**	**0**	**17**	**9**	**6**	**547**	**28**	**2**	**583**	**537**	**19**	**0**	**30**	**0**	**49**	**65**	**1205**		**42**	**8**	**50**
	PHF	0.9	0.97	0.75	0.25	0.97	0.85	0.67	0.25	0	0	0.71	0.75	0.75	0.86	0.58	0.25	0.88	0.93	0.43	0	0.62	0	0.53	0.77	0.93				
	Approach %					46%	49%					1%	1%					48%	45%					4%	5%					

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-033 BROADWAY-30TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 1

Groups Printed- Unshifted

	BROADWAY Southbound					30TH ST. Westbound					BROADWAY Northbound					30TH ST. Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	7	65	3	3	75	4	1	0	5	5	5	70	3	2	78	3	4	3	1	10	11	168	179
07:15	4	63	17	6	84	3	1	6	6	10	6	76	4	4	86	1	2	4	0	7	16	187	203
07:30	5	92	10	5	107	4	3	4	4	11	14	89	1	3	104	2	4	3	1	9	13	231	244
07:45	5	100	13	7	118	6	8	6	8	20	15	105	4	2	124	3	4	1	2	8	19	270	289
Total	21	320	43	21	384	17	13	16	23	46	40	340	12	11	392	9	14	11	4	34	59	856	915
08:00	7	166	21	3	194	8	5	5	2	18	11	142	3	3	156	6	5	6	1	17	9	385	394
08:15	6	146	8	9	160	2	13	2	3	17	18	134	3	5	155	7	7	5	2	19	19	351	370
08:30	14	165	21	10	200	7	6	4	5	17	19	120	4	0	143	6	6	5	0	17	15	377	392
08:45	9	162	20	2	191	10	10	5	4	25	11	122	14	1	147	7	6	5	2	18	9	381	390
Total	36	639	70	24	745	27	34	16	14	77	59	518	24	9	601	26	24	21	5	71	52	1494	1546
*** BREAK ***																							
16:00	9	160	10	10	179	7	1	10	12	18	14	169	6	6	189	19	3	23	2	45	30	431	461
16:15	15	166	17	5	198	10	1	14	12	25	21	165	1	9	187	16	4	16	4	36	30	446	476
16:30	12	182	7	6	201	6	3	3	11	12	10	183	7	3	200	18	4	17	5	39	25	452	477
16:45	10	152	6	9	168	11	2	11	6	24	10	179	4	4	193	16	2	21	1	39	20	424	444
Total	46	660	40	30	746	34	7	38	41	79	55	696	18	22	769	69	13	77	12	159	105	1753	1858
17:00	7	222	5	10	234	6	4	9	8	19	10	179	1	11	190	20	4	24	2	48	31	491	522
17:15	9	181	11	12	201	11	2	9	9	22	11	213	7	8	231	25	3	15	8	43	37	497	534
17:30	9	178	7	6	194	5	3	3	11	11	11	204	6	5	221	22	1	15	3	38	25	464	489
17:45	10	154	7	5	171	6	3	6	8	15	14	188	5	2	207	17	0	11	5	28	20	421	441
Total	35	735	30	33	800	28	12	27	36	67	46	784	19	26	849	84	8	65	18	157	113	1873	1986
Grand Total	138	2354	183	108	2675	106	66	97	114	269	200	2338	73	68	2611	188	59	174	39	421	329	5976	6305
Apprch %	5.2	88	6.8			39.4	24.5	36.1			7.7	89.5	2.8			44.7	14	41.3					
Total %	2.3	39.4	3.1		44.8	1.8	1.1	1.6		4.5	3.3	39.1	1.2		43.7	3.1	1	2.9		7	5.2	94.8	

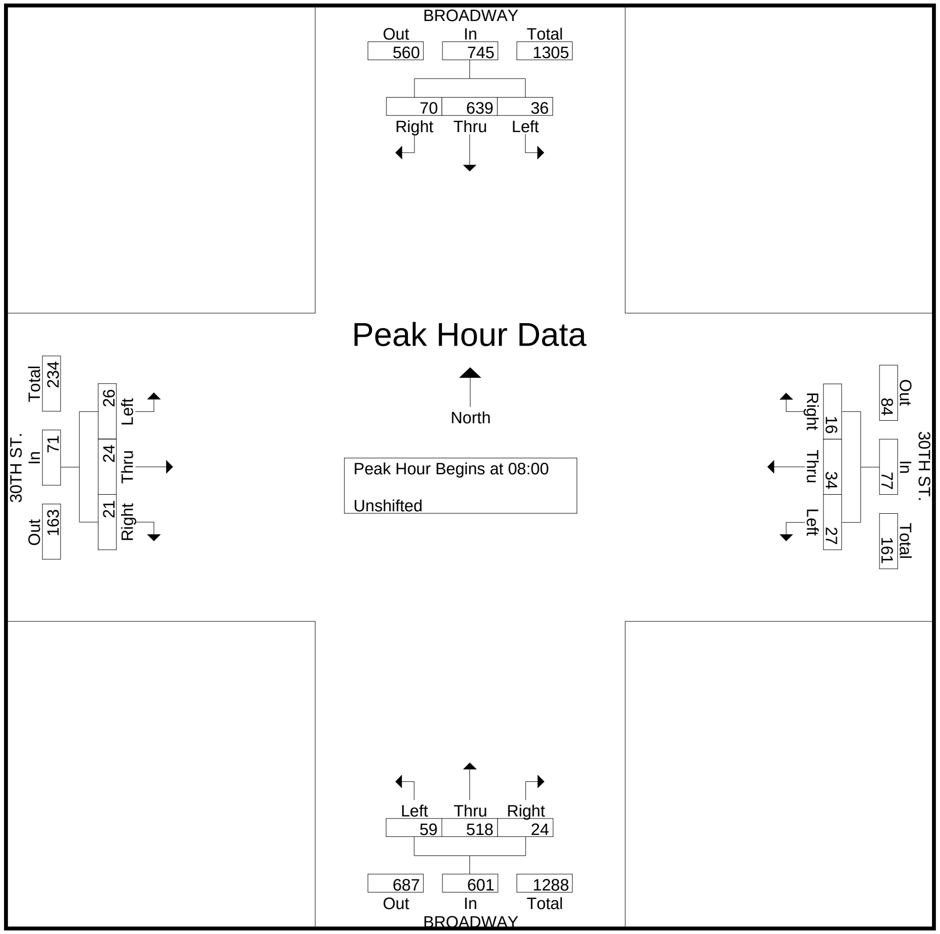
	BROADWAY Southbound				30TH ST. Westbound				BROADWAY Northbound				30TH ST. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	7	**166**	**21**	194	8	5	**5**	18	11	**142**	3	**156**	6	5	**6**	17	**385**
08:15	6	146	8	160	2	**13**	2	17	18	134	3	155	**7**	**7**	5	**19**	351
08:30	**14**	165	21	**200**	7	6	4	17	**19**	120	4	143	6	6	5	17	377
08:45	9	162	20	191	**10**	10	5	**25**	11	122	**14**	147	7	6	5	18	381
Total Volume	36	639	70	745	27	34	16	77	59	518	24	601	26	24	21	71	1494
% App. Total	4.8	85.8	9.4		35.1	44.2	20.8		9.8	86.2	4		36.6	33.8	29.6		
PHF	.643	.962	.833	.931	.675	.654	.800	.770	.776	.912	.429	.963	.929	.857	.875	.934	.970

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-033 BROADWAY-30TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

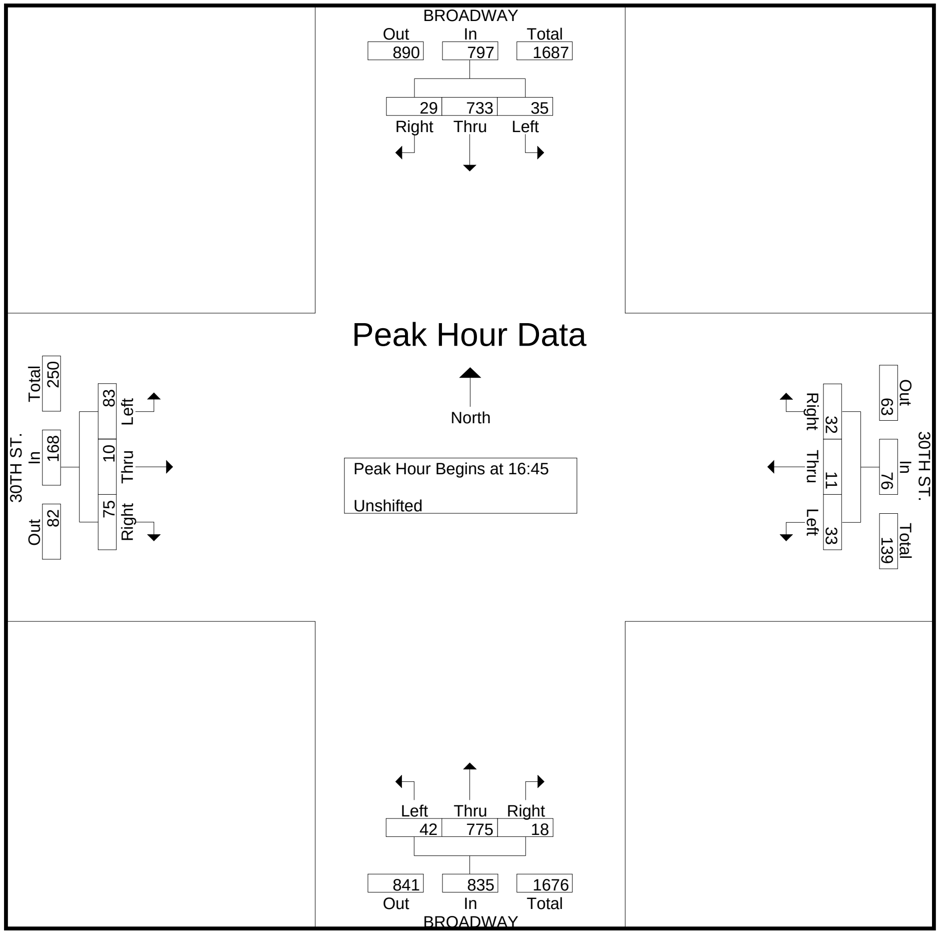
16:45	**10**	152	6	168	**11**	2	**11**	**24**	10	179	4	193	16	2	21	39	424
17:00	7	**222**	5	**234**	6	**4**	9	19	10	179	1	190	20	**4**	**24**	**48**	491
17:15	9	181	**11**	201	11	2	9	22	**11**	**213**	**7**	**231**	**25**	3	15	43	**497**
17:30	9	178	7	194	5	3	3	11	11	204	6	221	22	1	15	38	464
Total Volume	35	733	29	797	33	11	32	76	42	775	18	835	83	10	75	168	1876
% App. Total	4.4	92	3.6		43.4	14.5	42.1		5	92.8	2.2		49.4	6	44.6		
PHF	.875	.825	.659	.851	.750	.688	.727	.792	.955	.910	.643	.904	.830	.625	.781	.875	.944

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-033 BROADWAY-30TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 3



Study Name WC09-2618 -- Broadway/30th St
Start Date Saturday, December 01, 2012 12:00 PM
End Date Saturday, December 01, 2012 4:00 PM
Site Code

Report Summary

		Southbound						Westbound						Northbound						Eastbound								Crosswalk		
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Peopleike (Cro		Total
Peak 1	Car	21	583	18	13	635	620	17	8	26	0	51	48	20	562	25	7	614	643	27	10	28	0	65	54	1365	SB	10	0	10
Specified Period	%	100%	98%	100%	100%	98%	98%	100%	100%	100%	0%	100%	100%	100%	98%	100%	100%	98%	98%	100%	100%	100%	0%	100%	100%	98%		100%	0%	
12:00 PM - 4:00 PM	ɜdal Bike (Roa	0	12	0	0	12	11	0	0	0	0	0	0	0	11	0	0	11	12	0	0	0	0	0	0	23	WB	28	3	31
One Hour Peak	%	0%	2%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	2%		90%	10%	
12:45 PM - 1:45 PM	Motor Bike	0	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	2	NB	13	0	13
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		100%	0%	
	Total	**21**	**596**	**18**	**13**	**648**	**632**	**17**	**8**	**26**	**0**	**51**	**48**	**20**	**574**	**25**	**7**	**626**	**656**	**27**	**10**	**28**	**0**	**65**	**54**	**1390**	EB	12	0	12
	PHF	0.75	0.86	0.75	0.65	0.84	0.95	0.53	0.4	0.81	0	0.61	0.75	0.62	0.93	0.78	0.35	0.89	0.89	0.84	0.62	0.7	0	0.86	0.75	0.95		100%	0%	
	Approach %					47%	45%					4%	3%					45%	47%					5%	4%			**63**	**3**	**66**

OAKLAND

File Name : 08-7650-032 BROADWAY-29TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 1

Groups Printed- Unshifted

	BROADWAY Southbound				29TH ST. Westbound				BROADWAY Northbound				29TH ST. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	3	66	1	70	4	23	5	32	7	65	7	79	1	4	7	12	193
07:15	3	64	6	73	8	12	9	29	11	76	7	94	4	8	6	18	214
07:30	4	87	8	99	4	18	8	30	13	93	6	112	4	7	12	23	264
07:45	5	95	5	105	10	30	12	52	22	118	6	146	3	9	6	18	321
Total	15	312	20	347	26	83	34	143	53	352	26	431	12	28	31	71	992
08:00	11	160	11	182	11	29	17	57	22	137	11	170	7	13	12	32	441
08:15	13	135	5	153	13	28	10	51	26	26	11	63	7	13	11	31	298
08:30	11	165	7	183	9	30	13	52	24	130	12	166	6	14	16	36	437
08:45	12	167	7	186	13	29	14	56	22	22	16	60	7	13	7	27	329
Total	47	627	30	704	46	116	54	216	94	315	50	459	27	53	46	126	1505
*** BREAK ***																	
16:00	18	152	11	181	14	18	13	45	21	153	19	193	14	22	22	58	477
16:15	19	162	6	187	11	14	7	32	15	174	15	204	10	25	20	55	478
16:30	23	170	4	197	16	20	8	44	16	170	24	210	13	30	26	69	520
16:45	17	161	9	187	9	17	10	36	14	179	24	217	13	25	17	55	495
Total	77	645	30	752	50	69	38	157	66	676	82	824	50	102	85	237	1970
17:00	23	221	8	252	15	16	7	38	12	175	25	212	12	36	21	69	571
17:15	26	178	3	207	17	13	6	36	11	215	25	251	13	39	19	71	565
17:30	25	170	1	196	13	21	5	39	8	216	21	245	4	31	17	52	532
17:45	25	139	5	169	12	12	8	32	12	194	20	226	3	25	17	45	472
Total	99	708	17	824	57	62	26	145	43	800	91	934	32	131	74	237	2140
Grand Total	238	2292	97	2627	179	330	152	661	256	2143	249	2648	121	314	236	671	6607
Apprch %	9.1	87.2	3.7		27.1	49.9	23		9.7	80.9	9.4		18	46.8	35.2		
Total %	3.6	34.7	1.5	39.8	2.7	5	2.3	10	3.9	32.4	3.8	40.1	1.8	4.8	3.6	10.2	

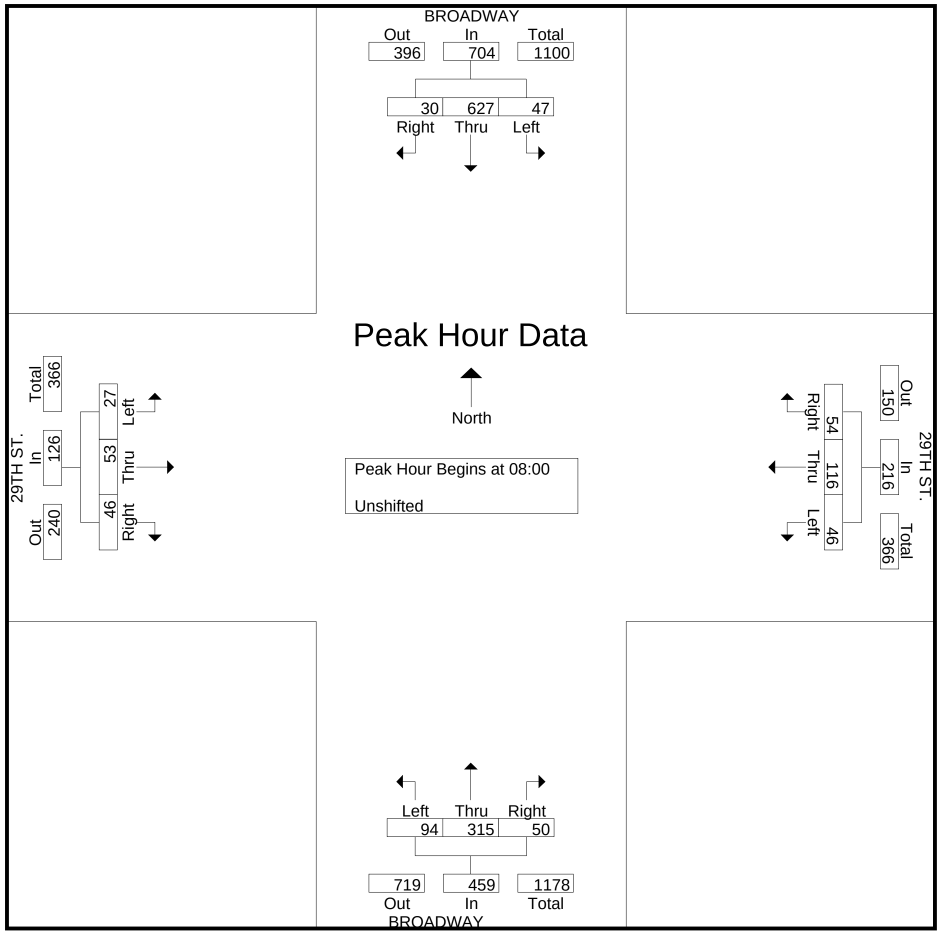
	BROADWAY Southbound				29TH ST. Westbound				BROADWAY Northbound				29TH ST. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	11	160	**11**	182	11	29	**17**	**57**	22	**137**	11	**170**	**7**	13	12	32	**441**
08:15	**13**	135	5	153	**13**	28	10	51	**26**	26	11	63	7	13	11	31	298
08:30	11	165	7	183	9	**30**	13	52	24	130	12	166	6	**14**	**16**	**36**	437
08:45	12	**167**	7	**186**	13	29	14	56	22	22	**16**	60	7	13	7	27	329
Total Volume	47	627	30	704	46	116	54	216	94	315	50	459	27	53	46	126	1505
% App. Total	6.7	89.1	4.3		21.3	53.7	25		20.5	68.6	10.9		21.4	42.1	36.5		
PHF	.904	.939	.682	.946	.885	.967	.794	.947	.904	.575	.781	.675	.964	.946	.719	.875	.853

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-032 BROADWAY-29TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 2



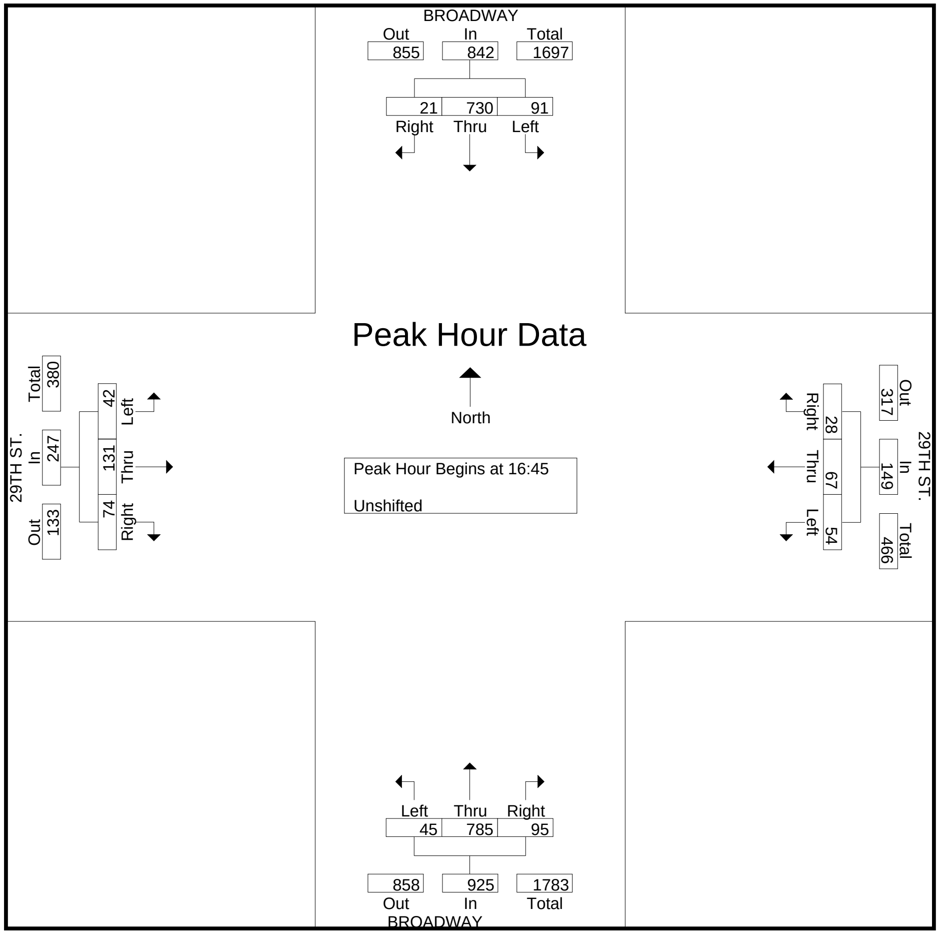
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

16:45	17	161	**9**	187	9	17	**10**	36	**14**	179	24	217	**13**	25	17	55	495
17:00	23	**221**	8	**252**	15	16	7	38	12	175	**25**	212	12	36	**21**	69	**571**
17:15	**26**	178	3	207	**17**	13	6	36	11	215	25	**251**	13	**39**	19	**71**	565
17:30	25	170	1	196	13	**21**	5	**39**	8	**216**	21	245	4	31	17	52	532
Total Volume	91	730	21	842	54	67	28	149	45	785	95	925	42	131	74	247	2163
% App. Total	10.8	86.7	2.5		36.2	45	18.8		4.9	84.9	10.3		17	53	30		
PHF	.875	.826	.583	.835	.794	.798	.700	.955	.804	.909	.950	.921	.808	.840	.881	.870	.947

All Traffic Data
(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-032 BROADWAY-29TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 3



Study Name	WC09-2618 -- Broadway/29th St																													
Start Date	Saturday, November 10, 2012 12:00 PM																													
End Date	Saturday, November 10, 2012 4:00 PM																													
Site Code																														

Report Summary

		Southbound						Westbound						Northbound						Eastbound							Crosswalk			
Time Period	**Class.**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**Total**		**Peopleike (Cro**		**Total**
Peak 1	Car	18	444	51	5	518	512	34	55	60	0	149	164	52	450	32	13	547	551	34	61	23	0	118	105	1332	SB	32	3	35
Specified Period	%	100%	91%	94%	100%	92%	92%	92%	93%	97%	0%	94%	96%	100%	91%	94%	100%	92%	92%	94%	95%	100%	0%	96%	95%	93%		91%	9%	
12:00 PM - 4:00 PM	Truck	0	10	1	0	11	11	0	0	0	0	0	2	0	11	0	0	11	10	0	1	0	0	1	0	23	WB	93	2	95
One Hour Peak	%	0%	2%	2%	0%	2%	2%	0%	0%	0%	0%	0%	1%	0%	2%	0%	0%	2%	2%	0%	2%	0%	0%	1%	0%	2%		98%	2%	
12:00 PM - 1:00 PM	edal Bike (Roa	0	31	2	0	33	34	3	3	2	0	8	4	0	31	2	0	33	35	2	2	0	0	4	5	78	NB	35	1	36
	%	0%	6%	4%	0%	6%	6%	8%	5%	3%	0%	5%	2%	0%	6%	6%	0%	6%	6%	6%	3%	0%	0%	3%	5%	5%		97%	3%	
	Motor Bike	0	1	0	0	1	1	0	1	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0	1	3	EB	20	0	20
	%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%		100%	0%	
	Total	**18**	**486**	**54**	**5**	**563**	**558**	**37**	**59**	**62**	**0**	**158**	**170**	**52**	**493**	**34**	**13**	**592**	**597**	**36**	**64**	**23**	**0**	**123**	**111**	**1436**		**180**	**6**	**186**
	PHF	0.64	0.94	0.64	0.62	0.91	0.9	0.66	0.82	0.78	0	0.99	0.73	0.72	0.96	0.65	0.46	0.95	0.97	0.82	0.8	0.57	0	0.93	0.87	0.98				
	Approach %					39%	39%					11%	12%					41%	42%					9%	8%					

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-010-TELEGRAPH-27TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 1

Groups Printed- Unshifted

	TELEGRAPH AVE. Southbound					27TH ST. Westbound					TELEGRAPH AVE. Northbound					27TH ST. Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	3	30	14	1	47	7	29	18	0	54	12	47	4	0	63	39	44	18	1	101	2	265	267
07:15	3	39	28	7	70	1	19	26	1	46	10	49	3	3	62	29	42	27	4	98	15	276	291
07:30	10	48	23	6	81	13	34	12	2	59	17	42	7	0	66	51	40	25	4	116	12	322	334
07:45	16	68	23	8	107	3	42	14	0	59	19	70	8	3	97	46	65	31	12	142	23	405	428
Total	32	185	88	22	305	24	124	70	3	218	58	208	22	6	288	165	191	101	21	457	52	1268	1320
08:00	7	74	30	10	111	8	38	17	1	63	10	71	6	0	87	50	67	36	3	153	14	414	428
08:15	15	82	28	2	125	7	78	22	0	107	18	83	10	1	111	65	82	28	4	175	7	518	525
08:30	15	85	31	4	131	7	59	23	0	89	10	88	8	1	106	68	77	23	1	168	6	494	500
08:45	8	90	23	5	121	17	47	30	4	94	26	79	7	0	112	68	83	26	2	177	11	504	515
Total	45	331	112	21	488	39	222	92	5	353	64	321	31	2	416	251	309	113	10	673	38	1930	1968
*** BREAK ***																							
16:00	14	109	88	6	211	2	75	26	2	103	40	95	11	7	146	40	42	33	5	115	20	575	595
16:15	30	87	84	8	201	10	93	30	2	133	35	100	10	2	145	38	66	28	3	132	15	611	626
16:30	21	106	90	5	217	9	91	29	6	129	41	101	15	0	157	34	54	31	5	119	16	622	638
16:45	25	131	90	4	246	7	111	26	0	144	55	105	16	3	176	31	65	30	2	126	9	692	701
Total	90	433	352	23	875	28	370	111	10	509	171	401	52	12	624	143	227	122	15	492	60	2500	2560
17:00	36	138	98	5	272	12	136	22	2	170	41	123	15	0	179	25	76	30	2	131	9	752	761
17:15	23	120	76	3	219	12	131	28	3	171	49	124	15	10	188	29	90	37	1	156	17	734	751
17:30	36	118	76	0	230	12	117	28	1	157	42	105	16	7	163	34	80	30	4	144	12	694	706
17:45	31	127	63	4	221	16	116	26	1	158	40	120	16	2	176	29	85	11	2	125	9	680	689
Total	126	503	313	12	942	52	500	104	7	656	172	472	62	19	706	117	331	108	9	556	47	2860	2907
Grand Total	293	1452	865	78	2610	143	1216	377	25	1736	465	1402	167	39	2034	676	1058	444	55	2178	197	8558	8755
Apprch %	11.2	55.6	33.1			8.2	70	21.7			22.9	68.9	8.2			31	48.6	20.4					
Total %	3.4	17	10.1		30.5	1.7	14.2	4.4		20.3	5.4	16.4	2		23.8	7.9	12.4	5.2		25.4	2.3	97.7	

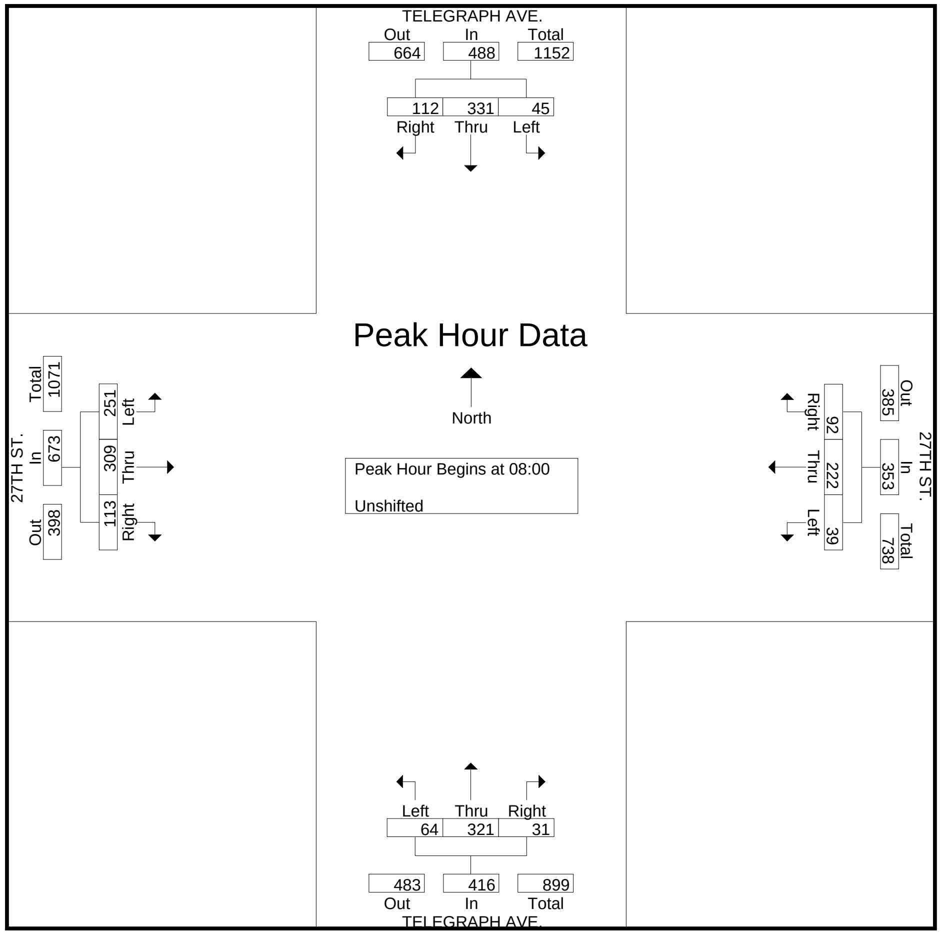
	TELEGRAPH AVE. Southbound				27TH ST. Westbound				TELEGRAPH AVE. Northbound				27TH ST. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	7	74	30	111	8	38	17	63	10	71	6	87	50	67	**36**	153	414
08:15	**15**	82	28	125	7	**78**	22	**107**	18	83	**10**	111	65	82	28	175	**518**
08:30	15	85	**31**	**131**	7	59	23	89	10	**88**	8	106	**68**	77	23	168	494
08:45	8	**90**	23	121	**17**	47	**30**	94	**26**	79	7	**112**	68	**83**	26	**177**	504
Total Volume	45	331	112	488	39	222	92	353	64	321	31	416	251	309	113	673	1930
% App. Total	9.2	67.8	23		11	62.9	26.1		15.4	77.2	7.5		37.3	45.9	16.8		
PHF	.750	.919	.903	.931	.574	.712	.767	.825	.615	.912	.775	.929	.923	.931	.785	.951	.931

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-010-TELEGRAPH-27TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 2



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

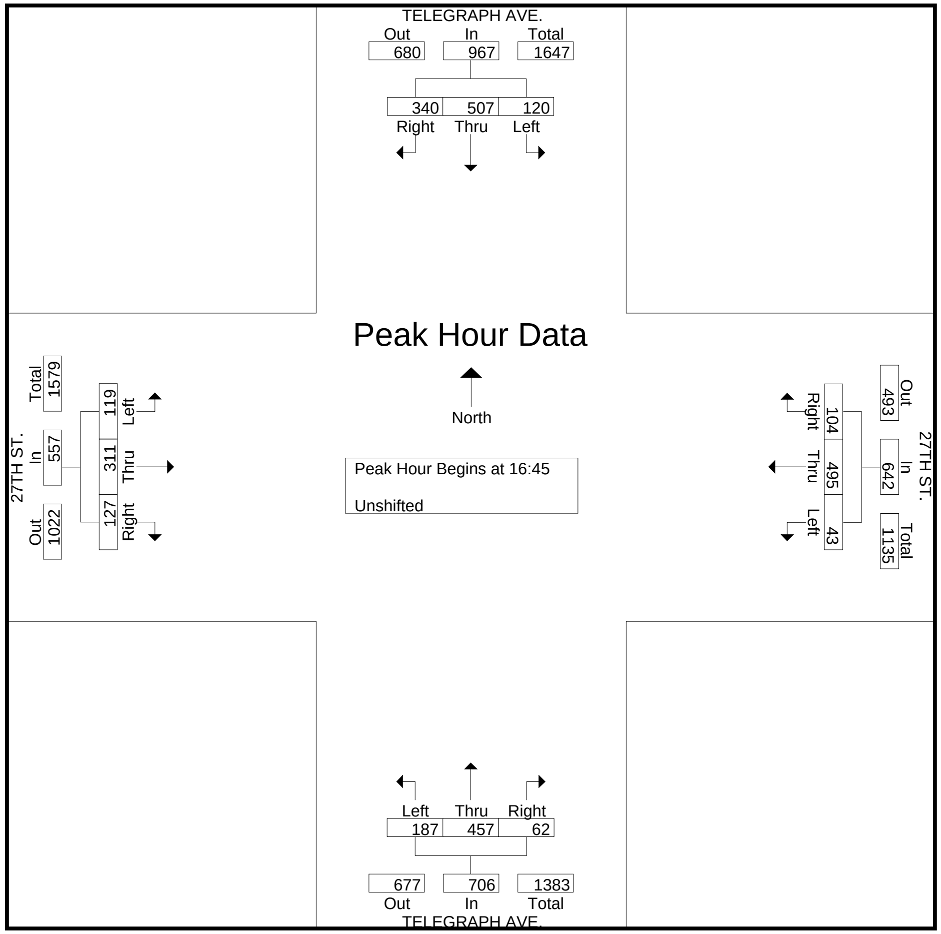
16:45	25	131	90	246	7	111	26	144	**55**	105	**16**	176	31	65	30	126	692
17:00	**36**	**138**	**98**	**272**	**12**	**136**	22	170	41	123	15	179	25	76	30	131	**752**
17:15	23	120	76	219	12	131	**28**	**171**	49	**124**	15	**188**	29	**90**	**37**	**156**	734
17:30	36	118	76	230	12	117	28	157	42	105	16	163	**34**	80	30	144	694
Total Volume	120	507	340	967	43	495	104	642	187	457	62	706	119	311	127	557	2872
% App. Total	12.4	52.4	35.2		6.7	77.1	16.2		26.5	64.7	8.8		21.4	55.8	22.8		
PHF	.833	.918	.867	.889	.896	.910	.929	.939	.850	.921	.969	.939	.875	.864	.858	.893	.955

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-010-TELEGRAPH-27TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 3



Study Name WC09-2618 -- Telegraph Ave/27th St
Start Date Saturday, November 10, 2012 12:00 PM
End Date Saturday, November 10, 2012 4:00 PM
Site Code

Report Summary

		Southbound						Westbound						Northbound						Eastbound								Crosswalk		
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Peopleike (Cro		Total
Peak 1	Car	150	362	68	0	580	549	82	226	24	4	336	260	29	364	117	1	511	481	94	159	103	5	361	498	1788	SB	13	1	14
Specified Period	%	97%	94%	89%	0%	94%	94%	98%	93%	92%	100%	94%	94%	100%	93%	100%	100%	95%	95%	99%	94%	95%	100%	96%	96%	95%		93%	7%	
12:00 PM - 4:00 PM	Truck	4	8	0	0	12	12	2	5	1	0	8	7	0	7	0	0	7	10	1	7	3	0	11	9	38	WB	37	3	40
One Hour Peak	%	3%	2%	0%	0%	2%	2%	2%	2%	4%	0%	2%	3%	0%	2%	0%	0%	1%	2%	1%	4%	3%	0%	3%	2%	2%		93%	8%	
12:45 PM - 1:45 PM	Bike	0	16	8	0	24	24	0	11	1	0	12	11	0	22	0	0	22	17	0	3	2	0	5	11	63	NB	7	1	8
	%	0%	4%	11%	0%	4%	4%	0%	5%	4%	0%	3%	4%	0%	6%	0%	0%	4%	3%	0%	2%	2%	0%	1%	2%	3%		88%	13%	
	Total	**154**	**386**	**76**	**0**	**616**	**585**	**84**	**242**	**26**	**4**	**356**	**278**	**29**	**393**	**117**	**1**	**540**	**508**	**95**	**169**	**108**	**5**	**377**	**518**	**1889**	EB	45	3	48
	PHF	0.94	0.85	0.83	0	0.88	0.94	0.72	0.9	0.81	0.5	0.92	0.88	0.91	0.94	0.89	0.25	0.95	0.88	0.88	0.8	0.84	0.62	0.88	0.93	0.97		94%	6%	
	Approach %					33%	31%					19%	15%					29%	27%					20%	27%			**102**	**8**	**110**

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-031 BROADWAY-27TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 1

Groups Printed- Unshifted

	BROADWAY Southbound					27TH ST. Westbound					BROADWAY Northbound					27TH ST. Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	10	57	6	2	73	3	32	26	6	61	10	40	0	0	50	15	26	10	2	51	10	235	245
07:15	14	64	6	5	84	5	35	26	6	66	7	55	3	3	65	17	28	13	5	58	19	273	292
07:30	7	75	7	4	89	4	39	28	7	71	4	68	3	2	75	12	29	24	4	65	17	300	317
07:45	9	100	5	18	114	3	48	41	13	92	6	90	3	1	99	19	39	30	6	88	38	393	431
Total	40	296	24	29	360	15	154	121	32	290	27	253	9	6	289	63	122	77	17	262	84	1201	1285
08:00	23	139	17	24	179	4	44	62	12	110	8	96	4	3	108	13	45	26	10	84	49	481	530
08:15	23	131	15	22	169	12	78	65	11	155	14	101	5	5	120	20	50	27	9	97	47	541	588
08:30	18	139	21	8	178	13	58	62	6	133	12	91	1	2	104	28	40	32	16	100	32	515	547
08:45	21	141	20	3	182	6	59	57	9	122	16	98	5	0	119	20	53	27	8	100	20	523	543
Total	85	550	73	57	708	35	239	246	38	520	50	386	15	10	451	81	188	112	43	381	148	2060	2208
*** BREAK ***																							
16:00	35	154	17	20	206	9	63	53	11	125	32	129	12	7	173	20	40	9	4	69	42	573	615
16:15	31	153	17	5	201	10	75	64	8	149	35	133	7	0	175	25	63	17	4	105	17	630	647
16:30	36	155	16	5	207	10	72	63	14	145	38	130	11	1	179	29	63	10	2	102	22	633	655
16:45	39	147	24	2	210	6	78	49	12	133	35	152	6	2	193	27	53	17	8	97	24	633	657
Total	141	609	74	32	824	35	288	229	45	552	140	544	36	10	720	101	219	53	18	373	105	2469	2574
17:00	35	203	29	9	267	4	99	39	14	142	39	154	5	2	198	23	63	20	7	106	32	713	745
17:15	35	172	28	7	235	10	97	50	16	157	33	172	12	7	217	30	85	22	15	137	45	746	791
17:30	37	160	21	13	218	6	91	52	6	149	39	181	8	2	228	30	89	12	9	131	30	726	756
17:45	31	124	22	1	177	7	103	60	13	170	25	162	3	1	190	22	92	22	19	136	34	673	707
Total	138	659	100	30	897	27	390	201	49	618	136	669	28	12	833	105	329	76	50	510	141	2858	2999
Grand Total	404	2114	271	148	2789	112	1071	797	164	1980	353	1852	88	38	2293	350	858	318	128	1526	478	8588	9066
Apprch %	14.5	75.8	9.7			5.7	54.1	40.3			15.4	80.8	3.8			22.9	56.2	20.8					
Total %	4.7	24.6	3.2		32.5	1.3	12.5	9.3		23.1	4.1	21.6	1		26.7	4.1	10	3.7		17.8	5.3	94.7	

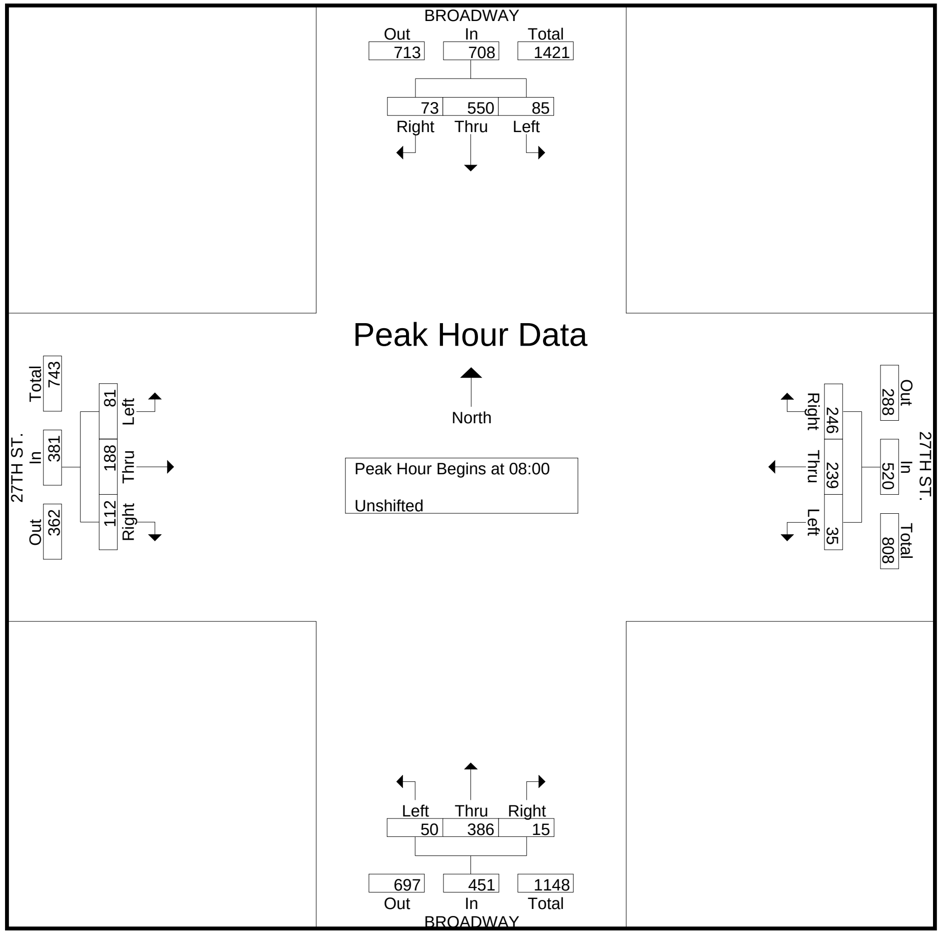
	BROADWAY Southbound				27TH ST. Westbound				BROADWAY Northbound				27TH ST. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	**23**	139	17	179	4	44	62	110	8	96	4	108	13	45	26	84	481
08:15	23	131	15	169	12	**78**	**65**	**155**	14	**101**	**5**	**120**	20	50	27	97	**541**
08:30	18	139	**21**	178	**13**	58	62	133	12	91	1	104	**28**	40	**32**	**100**	515
08:45	21	**141**	20	**182**	6	59	57	122	**16**	98	5	119	20	**53**	27	100	523
Total Volume	85	550	73	708	35	239	246	520	50	386	15	451	81	188	112	381	2060
% App. Total	12	77.7	10.3		6.7	46	47.3		11.1	85.6	3.3		21.3	49.3	29.4		
PHF	.924	.975	.869	.973	.673	.766	.946	.839	.781	.955	.750	.940	.723	.887	.875	.953	.952

All Traffic Data

(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-031 BROADWAY-27TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 2



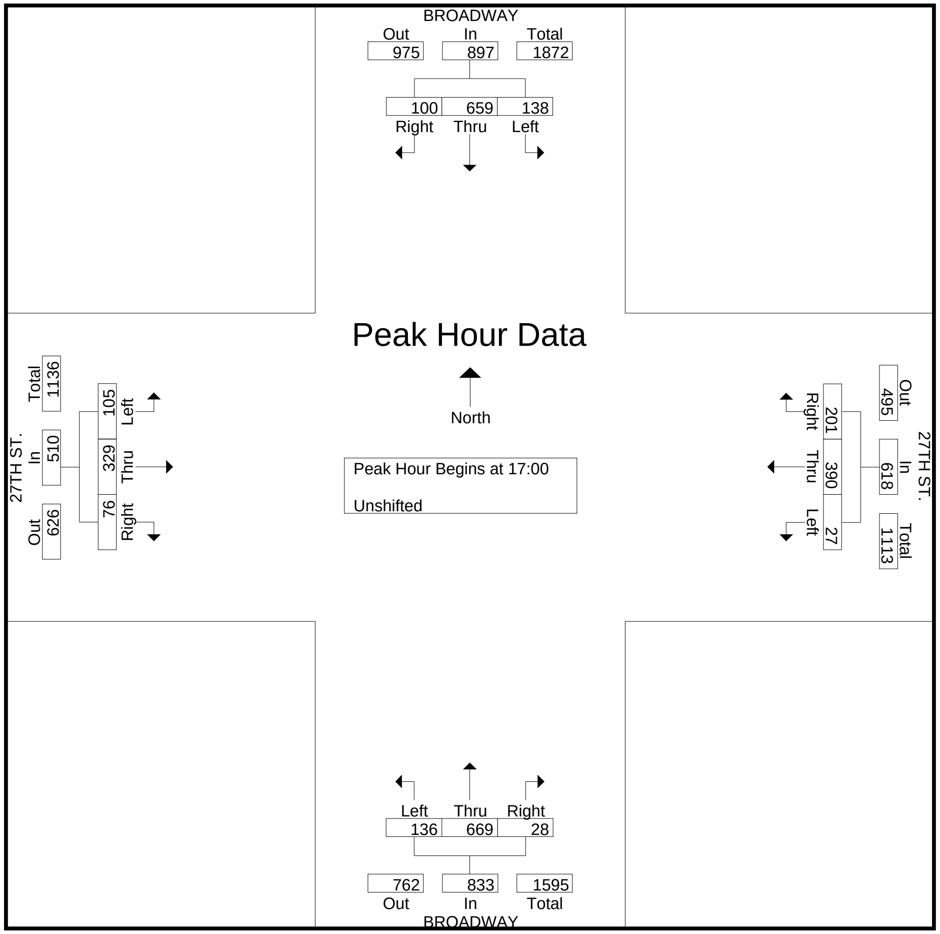
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	35	**203**	**29**	**267**	4	99	39	142	**39**	154	5	198	23	63	20	106	713
17:15	35	172	28	235	**10**	97	50	157	33	172	**12**	217	**30**	85	**22**	**137**	**746**
17:30	**37**	160	21	218	6	91	52	149	39	**181**	8	**228**	30	89	12	131	726
17:45	31	124	22	177	7	**103**	**60**	**170**	25	162	3	190	22	**92**	22	136	673
Total Volume	138	659	100	897	27	390	201	618	136	669	28	833	105	329	76	510	2858
% App. Total	15.4	73.5	11.1		4.4	63.1	32.5		16.3	80.3	3.4		20.6	64.5	14.9		
PHF	.932	.812	.862	.840	.675	.947	.838	.909	.872	.924	.583	.913	.875	.894	.864	.931	.958

All Traffic Data
(916) 771-8700
F (916) 786-2879

OAKLAND

File Name : 08-7650-031 BROADWAY-27TH-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 3



Study Name	WC09-2618 -- Broadway/27th St
Start Date	Saturday, November 10, 2012 12:00 PM
End Date	Saturday, November 10, 2012 4:00 PM
Site Code	

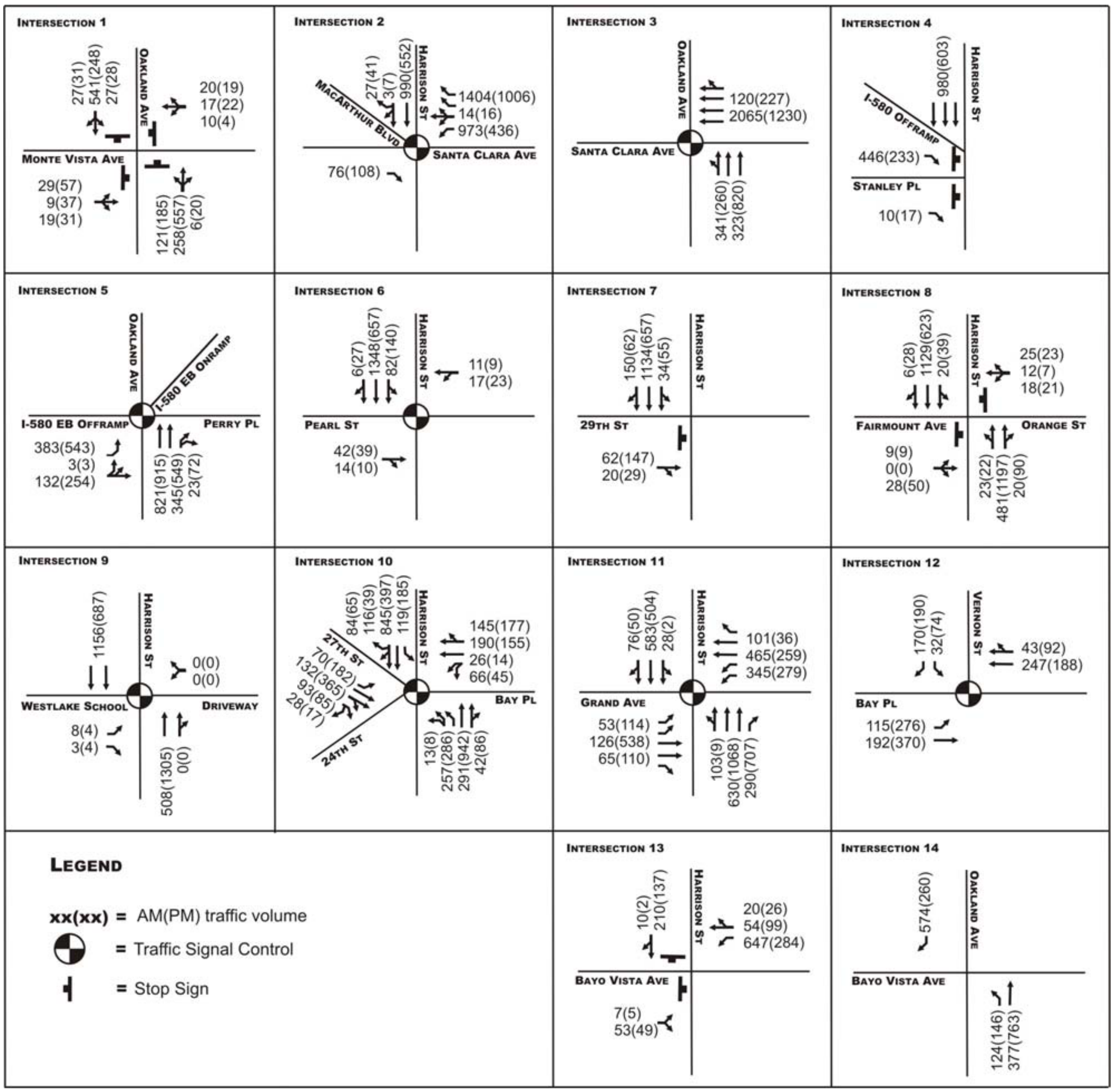
Report Summary

		Southbound						Westbound						Northbound						Eastbound								Crosswalk		
Time Period	Class.	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	R	T	L	U	I	O	Total		Peopleike (Cro		Total
Peak 1	Car	81	385	101	3	570	575	166	173	20	2	361	250	15	325	57	0	397	447	42	132	81	6	261	317	1589	SB	30	2	32
Specified Period	%	94%	92%	94%	100%	93%	91%	90%	90%	100%	100%	90%	91%	94%	91%	95%	0%	91%	93%	95%	89%	93%	100%	91%	92%	92%		94%	6%	
12:00 PM - 4:00 PM	Truck	4	8	0	0	12	21	5	0	0	0	5	3	0	11	0	0	11	8	0	3	5	0	8	4	36	WB	35	4	39
One Hour Peak	%	5%	2%	0%	0%	2%	3%	3%	0%	0%	0%	1%	1%	0%	3%	0%	0%	3%	2%	0%	2%	6%	0%	3%	1%	2%		90%	10%	
1:15 PM - 2:15 PM	ːdal Bike (Roa	1	25	6	0	32	35	13	19	0	0	32	18	0	22	3	0	25	26	1	12	0	0	13	23	102	NB	8	2	10
	%	1%	6%	6%	0%	5%	6%	7%	10%	0%	0%	8%	7%	0%	6%	5%	0%	6%	5%	2%	8%	0%	0%	5%	7%	6%		80%	20%	
	Motor Bike	0	1	0	0	1	1	0	1	0	0	1	3	1	0	0	0	1	2	1	2	1	0	4	1	7	EB	33	2	35
	%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	6%	0%	0%	0%	0%	0%	2%	1%	1%	0%	1%	0%	0%		94%	6%	
	Total	**86**	**419**	**107**	**3**	**615**	**632**	**184**	**193**	**20**	**2**	**399**	**274**	**16**	**358**	**60**	**0**	**434**	**483**	**44**	**149**	**87**	**6**	**286**	**345**	**1734**		**106**	**10**	**116**
	PHF	0.83	0.88	0.92	0.75	0.95	0.86	0.88	0.91	0.83	0.5	0.94	0.87	0.44	0.82	0.79	0	0.82	0.91	0.85	0.93	0.99	0.75	0.95	0.94	0.91				
	Approach %					35%	36%					23%	16%					25%	28%					16%	20%					

Intersection Operations

Manual intersection turning movement counts were conducted in the AM and PM peak-hours at the study intersections shown in Figure 2. The turning movement volumes and intersection geometries are shown in Figure 5.

Figure 5: Intersection Lane Geometries and Vehicle Peak-Hour Intersection Turning Volumes



Study Name WC09-2618 -- Harrison St/27th St, 24th St, Bay Place
Start Date Saturday, November 10, 2012 12:00 PM
End Date Saturday, November 10, 2012 4:00 PM
Site Code

Report Summary

		Southbound							Westbound						
Time Period	Class.	R	T2	T	L	U	I	O	R	T	L2	L	U	I	O
Peak 1	Car	60	21	256	151	0	488	559	197	152	11	48	1	409	405
Specified Period	%	95%	100%	97%	99%	0%	98%	99%	99%	82%	79%	98%	100%	91%	94%
12:00 PM - 4:00 PM	Truck	3	0	2	0	0	5	3	0	0	0	0	0	0	0
One Hour Peak	%	5%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%
12:45 PM - 1:45 PM	edal Bike (Roa	0	0	5	1	0	6	3	1	33	3	1	0	38	23
	%	0%	0%	2%	1%	0%	1%	1%	1%	18%	21%	2%	0%	9%	5%
	Motor Bike	0	0	0	0	0	0	1	0	0	0	0	0	0	2
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Total	**63**	**21**	**263**	**152**	**0**	**499**	**566**	**198**	**185**	**14**	**49**	**1**	**447**	**430**
	PHF	0.88	0.75	0.95	0.86	0	0.95	0.93	0.87	0.91	0.5	0.68	0.25	0.89	0.93
	Approach %						28%	32%						25%	24%

		Northbound							Northeastbound		Eastbound									Crosswalk		
Time Period	Class.	R	T	L	U2	U	I	O	I	O	R2	R	T	L	U	I	O	Total		People	ike (Crc	Total
Peak 1	Car	64	296	118	9	3	490	337	0	55	14	30	189	66	2	301	332	1688	SB	92	4	96
Specified Period	%	98%	98%	94%	100%	100%	97%	97%	0%	93%	93%	97%	89%	99%	100%	92%	88%	95%		96%	4%	
12:00 PM - 4:00 PM	Truck	0	2	2	0	0	4	3	0	1	1	1	0	1	0	3	5	12	WB	0	0	0
One Hour Peak	%	0%	1%	2%	0%	0%	1%	1%	0%	2%	7%	3%	0%	1%	0%	1%	1%	1%		0%	0%	
12:45 PM - 1:45 PM	edal Bike (Roa	0	2	5	0	0	7	6	0	3	0	0	22	0	0	22	38	73	NB	38	2	40
	%	0%	1%	4%	0%	0%	1%	2%	0%	5%	0%	0%	10%	0%	0%	7%	10%	4%		95%	5%	
	Motor Bike	1	1	1	0	0	3	0	0	0	0	0	1	0	0	1	1	4	NB2	37	1	38
	%	2%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		97%	3%	
	Total	**65**	**301**	**126**	**9**	**3**	**504**	**346**	**0**	**59**	**15**	**31**	**212**	**67**	**2**	**327**	**376**	**1777**	EB	46	2	48
	PHF	0.9	0.86	0.83	0.56	0.25	0.94	0.92	0	0.74	0.54	0.65	0.88	0.67	0.5	0.92	0.9	0.95		96%	4%	
	Approach %						28%	19%	0%	3%						18%	21%			**213**	**9**	**222**

All Traffic Data

(916) 771-8700
F (916) 786-2879

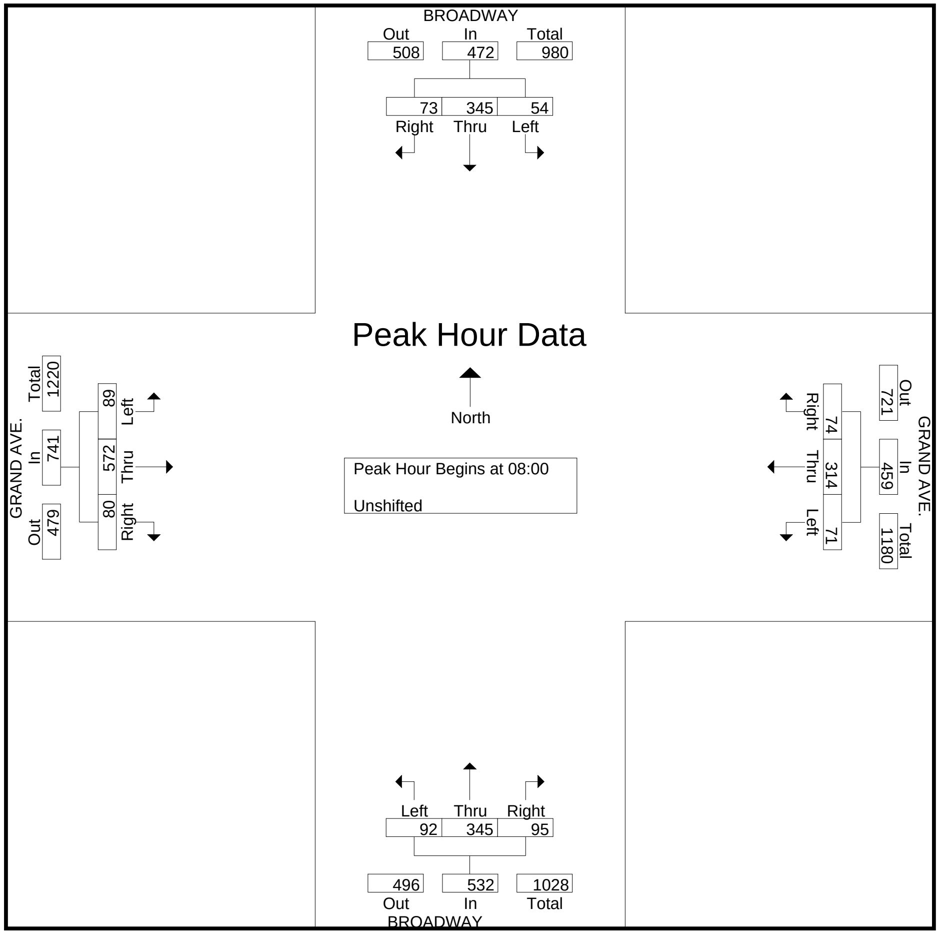
OAKLAND

File Name : 08-7650-030 BROADWAY-GRAND-F
Site Code : 00000000
Start Date : 11/06/2008
Page No : 1

Groups Printed- Unshifted

	BROADWAY Southbound					GRAND AVE. Westbound					BROADWAY Northbound					GRAND AVE. Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	9	34	9	8	52	18	58	13	16	89	16	40	17	12	73	8	80	7	15	95	51	309	360
07:15	8	29	19	3	56	10	64	13	10	87	18	58	22	16	98	11	82	13	21	106	50	347	397
07:30	12	47	21	1	80	20	87	7	6	114	11	70	24	12	105	12	88	15	24	115	43	414	457
07:45	11	44	17	4	72	17	74	15	7	106	19	80	34	31	133	9	120	25	34	154	76	465	541
Total	40	154	66	16	260	65	283	48	39	396	64	248	97	71	409	40	370	60	94	470	220	1535	1755
08:00	15	82	20	0	117	14	69	18	6	101	25	89	26	28	140	22	143	14	35	179	69	537	606
08:15	11	81	13	2	105	17	83	20	9	120	24	86	23	22	133	18	148	22	44	188	77	546	623
08:30	18	83	16	3	117	19	81	18	6	118	20	82	20	39	122	29	136	24	39	189	87	546	633
08:45	10	99	24	2	133	21	81	18	2	120	23	88	26	21	137	20	145	20	35	185	60	575	635
Total	54	345	73	7	472	71	314	74	23	459	92	345	95	110	532	89	572	80	153	741	293	2204	2497
*** BREAK ***																							
16:00	12	82	21	9	115	13	74	11	11	98	53	137	42	21	232	17	102	15	15	134	56	579	635
16:15	15	91	22	3	128	16	74	11	17	101	61	127	39	21	227	17	104	17	21	138	62	594	656
16:30	15	106	18	3	139	15	77	13	10	105	31	138	38	36	207	19	125	23	19	167	68	618	686
16:45	26	95	20	4	141	16	66	10	18	92	64	133	45	31	242	15	143	24	25	182	78	657	735
Total	68	374	81	19	523	60	291	45	56	396	209	535	164	109	908	68	474	79	80	621	264	2448	2712
17:00	20	110	31	0	161	20	96	10	4	126	56	141	25	40	222	24	152	20	16	196	60	705	765
17:15	20	95	25	2	140	17	94	12	6	123	60	140	29	30	229	32	169	25	20	226	58	718	776
17:30	19	89	18	2	126	18	85	8	9	111	60	151	34	10	245	29	166	20	17	215	38	697	735
17:45	21	74	25	0	120	19	78	5	9	102	49	148	36	20	233	35	139	8	24	182	53	637	690
Total	80	368	99	4	547	74	353	35	28	462	225	580	124	100	929	120	626	73	77	819	209	2757	2966
Grand Total	242	1241	319	46	1802	270	1241	202	146	1713	590	1708	480	390	2778	317	2042	292	404	2651	986	8944	9930
Apprch %	13.4	68.9	17.7			15.8	72.4	11.8			21.2	61.5	17.3			12	77	11					
Total %	2.7	13.9	3.6		20.1	3	13.9	2.3		19.2	6.6	19.1	5.4		31.1	3.5	22.8	3.3		29.6	9.9	90.1	

	BROADWAY Southbound				GRAND AVE. Westbound				BROADWAY Northbound				GRAND AVE. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	15	82	20	117	14	69	18	101	**25**	**89**	**26**	**140**	22	143	14	179	537
08:15	11	81	13	105	17	**83**	**20**	**120**	24	86	23	133	18	**148**	22	188	546
08:30	**18**	83	16	117	19	81	18	118	20	82	20	122	**29**	136	**24**	**189**	546
08:45	10	**99**	**24**	**133**	**21**	81	18	120	23	88	26	137	20	145	20	185	**575**
Total Volume	54	345	73	472	71	314	74	459	92	345	95	532	89	572	80	741	2204
% App. Total	11.4	73.1	15.5		15.5	68.4	16.1		17.3	64.8	17.9		12	77.2	10.8		
PHF	.750	.871	.760	.887	.845	.946	.925	.956	.920	.969	.913	.950	.767	.966	.833	.980	.958



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

16:45	**26**	95	20	141	16	66	10	92	**64**	133	**45**	242	15	143	24	182	657
17:00	20	**110**	**31**	**161**	**20**	**96**	10	**126**	56	141	25	222	24	152	20	196	705
17:15	20	95	25	140	17	94	**12**	123	60	140	29	229	**32**	**169**	**25**	**226**	**718**
17:30	19	89	18	126	18	85	8	111	60	**151**	34	**245**	29	166	20	215	697
Total Volume	85	389	94	568	71	341	40	452	240	565	133	938	100	630	89	819	2777
% App. Total	15	68.5	16.5		15.7	75.4	8.8		25.6	60.2	14.2		12.2	76.9	10.9		
PHF	.817	.884	.758	.882	.888	.888	.833	.897	.938	.935	.739	.957	.781	.932	.890	.906	.967

All Traffic Data
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File Name : 08-7650-030 BROADWAY-GRAND-F
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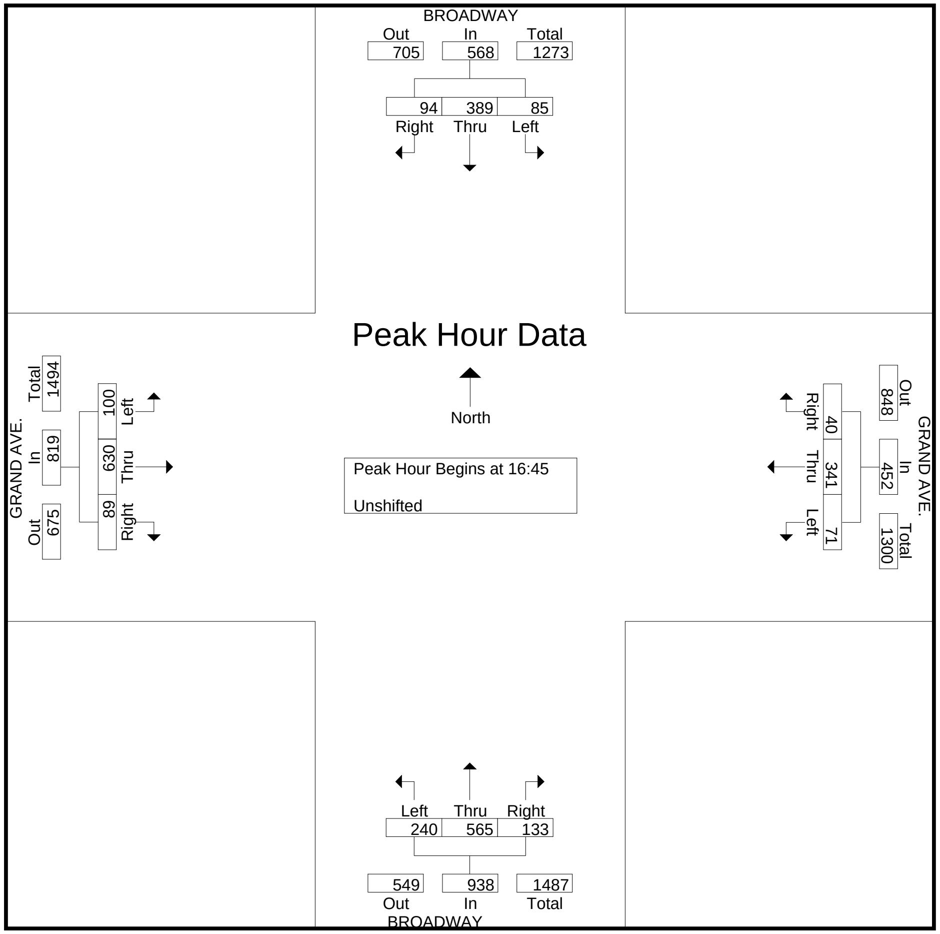

Study Name WC09-2618 -- Broadway/Grand Ave
Start Date Saturday, November 10, 2012 12:00 PM
End Date Saturday, November 10, 2012 4:00 PM
Site Code

Report Summary

		Southbound						Westbound						Northbound						Eastbound							Crosswalk			
Time Period	**Class.**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**R**	**T**	**L**	**U**	**I**	**O**	**Total**		**Peopleike (Cro**		**Total**
Peak 1	Car	67	267	54	1	389	416	42	247	61	0	350	482	103	305	75	1	484	384	55	325	68	7	455	396	1678	SB	66	2	68
Specified Period	%	97%	90%	96%	100%	92%	96%	100%	93%	85%	0%	92%	95%	94%	95%	93%	100%	94%	90%	96%	96%	97%	100%	96%	94%	94%		97%	3%	
12:00 PM - 4:00 PM	Truck	1	9	0	0	10	8	0	7	5	0	12	8	4	7	2	0	13	14	0	4	1	0	5	10	40	WB	73	5	78
One Hour Peak	%	1%	3%	0%	0%	2%	2%	0%	3%	7%	0%	3%	2%	4%	2%	2%	0%	3%	3%	0%	1%	1%	0%	1%	2%	2%		94%	6%	
12:00 PM - 1:00 PM	edal Bike (Roa	0	21	2	0	23	8	0	9	3	0	12	13	1	7	2	0	10	25	1	10	1	0	12	11	57	NB	96	4	100
	%	0%	7%	4%	0%	5%	2%	0%	3%	4%	0%	3%	3%	1%	2%	2%	0%	2%	6%	2%	3%	1%	0%	3%	3%	3%		96%	4%	
	Motor Bike	1	1	0	0	2	2	0	2	3	0	5	3	2	2	2	0	6	5	1	1	0	0	2	5	15	EB	74	2	76
	%	1%	0%	0%	0%	0%	0%	0%	1%	4%	0%	1%	1%	2%	1%	2%	0%	1%	1%	2%	0%	0%	0%	0%	1%	1%		97%	3%	
	Total	**69**	**298**	**56**	**1**	**424**	**434**	**42**	**265**	**72**	**0**	**379**	**506**	**110**	**321**	**81**	**1**	**513**	**428**	**57**	**340**	**70**	**7**	**474**	**422**	**1790**		**309**	**13**	**322**
	PHF	0.72	0.88	0.88	0.25	0.91	0.83	0.81	0.79	0.86	0	0.81	0.96	0.81	0.86	0.96	0.25	0.88	0.97	0.95	0.93	0.7	0.58	0.93	0.91	0.98				
	Approach %					24%	24%					21%	28%					29%	24%					26%	24%					

Appendix B3

LOS Calculation Worksheets
Existing Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	245	716	79	144	367	348	104	799	159	70	410	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			0.91			0.86	0.86
Frpb, ped/bikes	1.00	1.00		1.00	0.98			0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.93			0.98			1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.95	0.98
Satd. Flow (prot)	1770	3478		1770	3228			4905			1522	4693
Flt Permitted	0.95	1.00		0.95	1.00			1.00			0.95	0.98
Satd. Flow (perm)	1770	3478		1770	3228			4905			1522	4693
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	245	716	79	144	367	348	104	799	159	70	410	259
RTOR Reduction (vph)	0	7	0	0	161	0	0	23	0	0	0	0
Lane Group Flow (vph)	245	788	0	144	554	0	0	1040	0	0	238	501
Confl. Peds. (#/hr)			7			16			29			
Confl. Bikes (#/hr)			6			3			5			
Turn Type	Prot			Prot			Split			Split	Split	
Protected Phases	1	6		5	2		8	8		4	4	4
Permitted Phases												
Actuated Green, G (s)	15.0	28.0		13.0	26.0			27.5			25.5	25.5
Effective Green, g (s)	15.0	28.0		13.0	26.0			27.5			25.5	25.5
Actuated g/C Ratio	0.14	0.25		0.12	0.24			0.25			0.23	0.23
Clearance Time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	241	885		209	763			1226			353	1088
v/s Ratio Prot	c0.14	c0.23		0.08	0.17			c0.21			c0.16	0.11
v/s Ratio Perm												
v/c Ratio	1.02	0.89		0.69	0.73			0.85			0.67	0.46
Uniform Delay, d1	47.5	39.5		46.6	38.7			39.3			38.5	36.3
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	62.3	10.9		9.1	3.5			7.4			9.9	1.4
Delay (s)	109.8	50.4		55.7	42.2			46.6			48.4	37.7
Level of Service	F	D		E	D			D			D	D
Approach Delay (s)		64.4			44.4			46.6				40.2
Approach LOS		E			D			D				D

Intersection Summary			
HCM Average Control Delay	49.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	103
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1543
Flt Permitted	1.00
Satd. Flow (perm)	1543
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	103
RTOR Reduction (vph)	79
Lane Group Flow (vph)	24
Confl. Peds. (#/hr)	6
Confl. Bikes (#/hr)	5
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	25.5
Effective Green, g (s)	25.5
Actuated g/C Ratio	0.23
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	358
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.07
Uniform Delay, d1	33.0
Progression Factor	1.00
Incremental Delay, d2	0.4
Delay (s)	33.3
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL2	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	276	268	104	33	146	54	94	832	47	22	349	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95			0.91	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00			0.99	
Flpb, ped/bikes	1.00	1.00			1.00		0.99	1.00			1.00	
Frt	1.00	0.96			0.97		1.00	0.99			0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3361			3362		1755	3500			4888	
Flt Permitted	0.44	1.00			0.87		0.45	1.00			0.89	
Satd. Flow (perm)	819	3361			2945		834	3500			4339	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	276	268	104	33	146	54	94	832	47	22	349	80
RTOR Reduction (vph)	0	67	0	0	0	0	0	3	0	0	29	0
Lane Group Flow (vph)	276	305	0	0	233	0	94	876	0	0	422	0
Confl. Peds. (#/hr)			17	17		22	46		52	52		46
Confl. Bikes (#/hr)			7			3			14			10
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	7	4			8		1	6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	21.4	21.4			14.4		50.6	50.6			44.4	
Effective Green, g (s)	21.4	21.4			14.4		50.6	50.6			44.4	
Actuated g/C Ratio	0.27	0.27			0.18		0.63	0.63			0.55	
Clearance Time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	267	899			530		564	2214			2408	
v/s Ratio Prot	c0.05	0.09					0.01	c0.25				
v/s Ratio Perm	c0.23				0.08		0.10				0.10	
v/c Ratio	1.03	0.34			0.44		0.17	0.40			0.18	
Uniform Delay, d1	29.4	23.6			29.2		5.8	7.2			8.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	64.1	0.2			0.6		0.1	0.5			0.2	
Delay (s)	93.5	23.8			29.8		5.9	7.7			8.9	
Level of Service	F	C			C		A	A			A	
Approach Delay (s)		53.5			29.8			7.6			8.9	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SWR2
Lane Configurations	
Volume (vph)	17
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	1611
Flt Permitted	1.00
Satd. Flow (perm)	1611
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	17
RTOR Reduction (vph)	8
Lane Group Flow (vph)	9
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Turn Type	custom
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	44.4
Effective Green, g (s)	44.4
Actuated g/C Ratio	0.55
Clearance Time (s)	5.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	894
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.01
Uniform Delay, d1	8.0
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	8.0
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
3: W MacArthur Blvd. & Telegraph Ave. 5/22/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	325	165	116	270	95	199	508	59	192	545	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			0.99		0.99	1.00		0.99	1.00	
Frt		0.95			0.97		1.00	0.98		1.00	0.98	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		4735			4796		1748	3469		1746	3454	
Flt Permitted		0.82			0.73		0.41	1.00		0.44	1.00	
Satd. Flow (perm)		3920			3554		751	3469		805	3454	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	325	165	116	270	95	199	508	59	192	545	79
RTOR Reduction (vph)	0	68	0	0	65	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	482	0	0	416	0	199	563	0	192	618	0
Confl. Peds. (#/hr)	55		54	54		55	37		38	38		37
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		15.0			15.0		39.4	39.4		39.4	39.4	
Effective Green, g (s)		15.0			15.0		39.4	39.4		39.4	39.4	
Actuated g/C Ratio		0.23			0.23		0.61	0.61		0.61	0.61	
Clearance Time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		906			821		456	2106		489	2097	
v/s Ratio Prot								0.16			0.18	
v/s Ratio Perm		c0.12			0.12		c0.27			0.24		
v/c Ratio		0.53			0.51		0.44	0.27		0.39	0.29	
Uniform Delay, d1		21.9			21.7		6.8	6.0		6.6	6.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2		0.2	0.0		0.2	0.0	
Delay (s)		22.2			21.9		7.1	6.0		6.8	6.1	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		22.2			21.9			6.3			6.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	64.9	Sum of lost time (s)	10.5
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	640	64	103	426	182	144	615	110	228	421	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.92	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1500	1770	3539	1457	1770	3417		1770	3539	1535
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1500	1770	3539	1457	1770	3417		1770	3539	1535
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	640	64	103	426	182	144	615	110	228	421	36
RTOR Reduction (vph)	0	0	44	0	0	127	0	13	0	0	0	25
Lane Group Flow (vph)	113	640	20	103	426	55	144	712	0	228	421	11
Confl. Peds. (#/hr)			29			48			58			15
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	11.3	33.8	33.8	11.0	33.5	33.5	13.0	27.9		19.3	34.2	34.2
Effective Green, g (s)	11.3	33.8	33.8	11.0	33.5	33.5	13.0	27.9		19.3	34.2	34.2
Actuated g/C Ratio	0.10	0.31	0.31	0.10	0.30	0.30	0.12	0.25		0.18	0.31	0.31
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	182	1087	461	177	1078	444	209	867		311	1100	477
v/s Ratio Prot	c0.06	c0.18		0.06	0.12		0.08	c0.21		c0.13	0.12	
v/s Ratio Perm			0.01			0.04						0.01
v/c Ratio	0.62	0.59	0.04	0.58	0.40	0.12	0.69	0.82		0.73	0.38	0.02
Uniform Delay, d1	47.3	32.2	26.7	47.3	30.2	27.7	46.6	38.7		42.9	29.6	26.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	2.3	0.2	4.8	1.1	0.6	9.1	6.3		8.6	0.2	0.0
Delay (s)	53.7	34.6	26.9	52.1	31.3	28.2	55.7	45.0		51.5	29.9	26.3
Level of Service	D	C	C	D	C	C	E	D		D	C	C
Approach Delay (s)		36.6			33.5			46.7			36.9	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1053	81	94	622	214	72	192	337	217	102	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00	0.93	1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.96			1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3461		1770	4800			1838	1477	1770	1694	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3461		1770	4800			1838	1477	1770	1694	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	1053	81	94	622	214	72	192	337	217	102	63
RTOR Reduction (vph)	0	5	0	0	49	0	0	0	210	0	25	0
Lane Group Flow (vph)	100	1129	0	94	787	0	0	264	127	217	140	0
Confl. Peds. (#/hr)	20		55	55		20	69		24	24		69
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	7.3	42.6		4.5	39.8			18.9	18.9	17.0	17.0	
Effective Green, g (s)	7.3	42.6		4.5	39.8			18.9	18.9	17.0	17.0	
Actuated g/C Ratio	0.07	0.43		0.04	0.40			0.19	0.19	0.17	0.17	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	129	1474		80	1910			347	279	301	288	
v/s Ratio Prot	0.06	c0.33		c0.05	0.16			c0.14		c0.12	0.08	
v/s Ratio Perm									0.09			
v/c Ratio	0.78	0.77		1.18	0.41			0.76	0.46	0.72	0.49	
Uniform Delay, d1	45.5	24.5		47.8	21.7			38.4	36.0	39.3	37.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	22.8	3.9		155.3	0.7			8.6	0.4	7.0	0.5	
Delay (s)	68.3	28.3		203.1	22.3			47.0	36.4	46.3	38.0	
Level of Service	E	C		F	C			D	D	D	D	
Approach Delay (s)		31.6			40.6			41.0			42.7	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	37.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	234	69	709	356	109	644
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		8.5	8.5	8.5	8.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frpb, ped/bikes	0.98		1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3302		3539	1562	1770	3539
Flt Permitted	0.96		1.00	1.00	0.38	1.00
Satd. Flow (perm)	3302		3539	1562	712	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	234	69	709	356	109	644
RTOR Reduction (vph)	33	0	0	164	0	0
Lane Group Flow (vph)	270	0	709	192	109	644
Confl. Peds. (#/hr)		23		1		
Turn Type				custom	Perm	
Protected Phases	8		2 10			10
Permitted Phases				2	10	
Actuated Green, G (s)	17.5		54.0	13.7	31.8	31.8
Effective Green, g (s)	17.5		54.0	13.7	31.8	31.8
Actuated g/C Ratio	0.21		0.64	0.16	0.37	0.37
Clearance Time (s)	5.0			8.5	8.5	8.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	680		2248	252	266	1324
v/s Ratio Prot	c0.08		0.20			c0.18
v/s Ratio Perm				c0.12	0.15	
v/c Ratio	0.40		0.32	0.76	0.41	0.49
Uniform Delay, d1	29.2		7.1	34.1	19.7	20.4
Progression Factor	1.00		0.06	1.50	1.00	1.00
Incremental Delay, d2	0.1		0.3	15.7	4.6	1.3
Delay (s)	29.3		0.7	67.0	24.3	21.6
Level of Service	C		A	E	C	C
Approach Delay (s)	29.3		22.9			22.0
Approach LOS	C		C			C

Intersection Summary			
HCM Average Control Delay	23.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	10	75	33	11	32	42	775	18	35	733	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98			0.99		1.00	1.00		0.99	1.00	
Frt		0.94			0.94		1.00	1.00		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1650			1676		1763	3523		1754	3515	
Flt Permitted		0.82			0.85		0.33	1.00		0.32	1.00	
Satd. Flow (perm)		1394			1456		615	3523		588	3515	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	83	10	75	33	11	32	42	775	18	35	733	29
RTOR Reduction (vph)	0	34	0	0	23	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	134	0	0	53	0	42	791	0	35	759	0
Confl. Peds. (#/hr)	37		26	26		27	14		34	34		14
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		52.0	52.0		52.0	52.0	
Effective Green, g (s)		24.0			24.0		52.0	52.0		52.0	52.0	
Actuated g/C Ratio		0.28			0.28		0.61	0.61		0.61	0.61	
Clearance Time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		394			411		376	2155		360	2150	
v/s Ratio Prot								c0.22			0.22	
v/s Ratio Perm		c0.10			0.04		0.07			0.06		
v/c Ratio		0.34			0.13		0.11	0.37		0.10	0.35	
Uniform Delay, d1		24.2			22.7		6.9	8.3		6.8	8.2	
Progression Factor		1.00			1.00		0.34	0.29		2.50	2.41	
Incremental Delay, d2		2.3			0.6		0.6	0.4		0.5	0.4	
Delay (s)		26.5			23.4		2.9	2.9		17.6	20.1	
Level of Service		C			C		A	A		B	C	
Approach Delay (s)		26.5			23.4			2.9			20.0	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	131	74	54	67	28	45	785	95	91	730	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.97			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.98		0.98	1.00		0.99	1.00	
Frt		0.96			0.97		1.00	0.98		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1709			1734		1733	3466		1758	3516	
Flt Permitted		0.93			0.80		0.33	1.00		0.28	1.00	
Satd. Flow (perm)		1596			1421		609	3466		518	3516	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	131	74	54	67	28	45	785	95	91	730	21
RTOR Reduction (vph)	0	18	0	0	10	0	0	11	0	0	2	0
Lane Group Flow (vph)	0	229	0	0	139	0	45	869	0	91	749	0
Confl. Peds. (#/hr)	21		95	95		21	74		28	28		74
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		51.0	51.0		51.0	51.0	
Effective Green, g (s)		24.0			24.0		51.0	51.0		51.0	51.0	
Actuated g/C Ratio		0.28			0.28		0.60	0.60		0.60	0.60	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		451			401		365	2080		311	2110	
v/s Ratio Prot								c0.25			0.21	
v/s Ratio Perm		c0.14			0.10		0.07			0.18		
v/c Ratio		0.51			0.35		0.12	0.42		0.29	0.35	
Uniform Delay, d1		25.6			24.3		7.3	9.1		8.2	8.6	
Progression Factor		1.00			1.00		1.68	1.67		0.31	0.36	
Incremental Delay, d2		4.0			2.4		0.7	0.6		2.3	0.4	
Delay (s)		29.6			26.6		13.0	15.7		4.8	3.6	
Level of Service		C			C		B	B		A	A	
Approach Delay (s)		29.6			26.6			15.6			3.7	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	311	127	43	495	104	187	457	62	120	507	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3344		1770	3430		1766	3464		1765	3292	
Flt Permitted	0.95	1.00		0.95	1.00		0.27	1.00		0.43	1.00	
Satd. Flow (perm)	1770	3344		1770	3430		494	3464		795	3292	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	119	311	127	43	495	104	187	457	62	120	507	340
RTOR Reduction (vph)	0	51	0	0	22	0	0	11	0	0	121	0
Lane Group Flow (vph)	119	387	0	43	577	0	187	508	0	120	726	0
Confl. Peds. (#/hr)			20			12	9		6	6		9
Confl. Bikes (#/hr)			9			3			25			13
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.9	23.4		4.6	20.1		43.5	43.5		43.5	43.5	
Effective Green, g (s)	8.4	22.9		5.1	19.6		45.0	45.0		45.0	45.0	
Actuated g/C Ratio	0.10	0.27		0.06	0.23		0.53	0.53		0.53	0.53	
Clearance Time (s)	4.5	3.5		4.5	3.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	175	901		106	791		262	1834		421	1743	
v/s Ratio Prot	c0.07	c0.12		0.02	c0.17			0.15			0.22	
v/s Ratio Perm							c0.38			0.15		
v/c Ratio	0.68	0.43		0.41	0.73		0.71	0.28		0.29	0.42	
Uniform Delay, d1	37.0	25.7		38.5	30.3		15.1	11.0		11.1	12.1	
Progression Factor	1.00	1.00		0.93	1.36		0.95	0.84		0.89	0.86	
Incremental Delay, d2	8.3	0.1		0.9	2.8		14.9	0.4		1.7	0.7	
Delay (s)	45.3	25.8		36.5	44.0		29.4	9.6		11.6	11.1	
Level of Service	D	C		D	D		C	A		B	B	
Approach Delay (s)		30.0			43.5			14.9			11.1	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	329	79	27	390	201	136	669	28	138	659	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99			1.00	0.94	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00			1.00	1.00	0.99	1.00		0.99	1.00	
Frt	1.00	0.97			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1746	3419			3527	1495	1748	3509		1747	3442	
Flt Permitted	0.45	1.00			0.91	1.00	0.31	1.00		0.33	1.00	
Satd. Flow (perm)	832	3419			3221	1495	563	3509		615	3442	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	105	329	79	27	390	201	136	669	28	138	659	100
RTOR Reduction (vph)	0	25	0	0	0	104	0	4	0	0	14	0
Lane Group Flow (vph)	105	383	0	0	417	97	136	693	0	138	745	0
Confl. Peds. (#/hr)	30		12	12		30	50		49	49		50
Confl. Bikes (#/hr)			7			33			37			24
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		3			4			1			1	
Permitted Phases	3			4		4	1			1		
Actuated Green, G (s)	30.0	30.0			30.0	30.0	44.0	44.0		44.0	44.0	
Effective Green, g (s)	31.5	31.5			31.5	31.5	45.5	45.5		45.5	45.5	
Actuated g/C Ratio	0.37	0.37			0.37	0.37	0.54	0.54		0.54	0.54	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Grp Cap (vph)	308	1267			1194	554	301	1878		329	1842	
v/s Ratio Prot		0.11						0.20			0.22	
v/s Ratio Perm	0.13				c0.13	0.06	c0.24			0.22		
v/c Ratio	0.34	0.30			0.35	0.18	0.45	0.37		0.42	0.40	
Uniform Delay, d1	19.3	19.0			19.3	18.0	12.1	11.4		11.8	11.7	
Progression Factor	0.82	0.80			0.98	1.13	2.07	1.99		1.02	1.02	
Incremental Delay, d2	2.8	0.6			0.8	0.7	4.6	0.5		3.7	0.6	
Delay (s)	18.7	15.7			19.8	21.0	29.7	23.3		15.8	12.5	
Level of Service	B	B			B	C	C	C		B	B	
Approach Delay (s)		16.3			20.2			24.3			13.0	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	135.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	182	365	85	17	45	14	155	177	8	286	942	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00			1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.77			1.00	1.00	0.91		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85			1.00	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1226			1770	1863	1438		3433	3464	
Flt Permitted	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1226			1770	1863	1438		3433	3464	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	182	365	85	17	45	14	155	177	8	286	942	86
RTOR Reduction (vph)	0	0	4	0	0	0	0	142	0	0	4	0
Lane Group Flow (vph)	182	365	98	0	0	59	155	35	0	294	1024	0
Confl. Peds. (#/hr)			50					37				53
Confl. Bikes (#/hr)			2	2				1				2
Turn Type	Prot		Perm		Prot	Prot		Perm	Prot	Prot		
Protected Phases	10	4			3	3	8		5	5	2	
Permitted Phases			4					8				
Actuated Green, G (s)	25.3	19.3	19.3			7.5	31.8	31.8		15.3	64.4	
Effective Green, g (s)	25.3	19.3	19.3			7.5	31.8	31.8		15.3	64.4	
Actuated g/C Ratio	0.16	0.12	0.12			0.05	0.20	0.20		0.10	0.40	
Clearance Time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	2.0	2.0			2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	280	427	148			83	370	286		328	1394	
v/s Ratio Prot	c0.10	c0.10				c0.03	0.08			0.09	c0.30	
v/s Ratio Perm			0.08					0.02				
v/c Ratio	0.65	0.85	0.66			0.71	0.42	0.12		0.90	0.73	
Uniform Delay, d1	63.2	69.0	67.2			75.2	56.0	52.6		71.6	40.5	
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.3	14.8	7.8			21.1	0.3	0.1		24.8	3.5	
Delay (s)	68.5	83.8	75.1			96.3	56.3	52.7		96.4	44.0	
Level of Service	E	F	E			F	E	D		F	D	
Approach Delay (s)		78.1					60.7				55.7	
Approach LOS		E					E				E	

Intersection Summary			
HCM Average Control Delay	60.3	HCM Level of Service	E
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	185	397	39	65
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	0.93		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.97		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3193		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3193		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	397	39	65
RTOR Reduction (vph)	0	7	0	0
Lane Group Flow (vph)	185	494	0	0
Confl. Peds. (#/hr)			122	122
Confl. Bikes (#/hr)			12	12
Turn Type	Prot			
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	18.5	67.6		
Effective Green, g (s)	18.5	67.6		
Actuated g/C Ratio	0.12	0.42		
Clearance Time (s)	5.0	5.0		
Vehicle Extension (s)	2.0	2.0		
Lane Grp Cap (vph)	205	1349		
v/s Ratio Prot	c0.10	c0.15		
v/s Ratio Perm				
v/c Ratio	0.90	0.37		
Uniform Delay, d1	69.9	31.6		
Progression Factor	1.00	1.00		
Incremental Delay, d2	36.4	0.8		
Delay (s)	106.3	32.3		
Level of Service	F	C		
Approach Delay (s)		52.3		
Approach LOS		D		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	630	89	71	341	40	240	565	133	85	389	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99			1.00		1.00	1.00	0.94	1.00	0.98	
Flpb, ped/bikes	1.00	1.00			1.00		0.97	1.00	1.00	0.98	1.00	
Frt	1.00	0.98			0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1763	3422			3441		1711	3539	1493	1742	3383	
Flt Permitted	0.39	1.00			0.65		0.46	1.00	1.00	0.42	1.00	
Satd. Flow (perm)	725	3422			2247		834	3539	1493	767	3383	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	630	89	71	341	40	240	565	133	85	389	94
RTOR Reduction (vph)	0	16	0	0	11	0	0	0	28	0	19	0
Lane Group Flow (vph)	100	703	0	0	441	0	240	565	105	85	464	0
Confl. Peds. (#/hr)	8		120	120		8	78		37	37		78
Confl. Bikes (#/hr)			8			5			27			6
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	25.1	25.1			25.1		51.9	51.9	51.9	51.9	51.9	
Effective Green, g (s)	25.1	25.1			25.1		51.9	51.9	51.9	51.9	51.9	
Actuated g/C Ratio	0.30	0.30			0.30		0.61	0.61	0.61	0.61	0.61	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	214	1010			664		509	2161	912	468	2066	
v/s Ratio Prot		c0.21						0.16			0.14	
v/s Ratio Perm	0.14				0.20		c0.29		0.07	0.11		
v/c Ratio	0.47	0.70			0.66		0.47	0.26	0.12	0.18	0.22	
Uniform Delay, d1	24.5	26.6			26.3		9.1	7.7	6.9	7.2	7.5	
Progression Factor	0.96	0.93			1.56		1.00	1.00	1.00	0.57	0.49	
Incremental Delay, d2	0.5	1.5			1.9		3.1	0.3	0.3	0.8	0.3	
Delay (s)	24.1	26.3			42.9		12.2	8.0	7.2	5.0	3.9	
Level of Service	C	C			D		B	A	A	A	A	
Approach Delay (s)		26.1			42.9			8.9			4.0	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	161	0	31	0	0	10	23	872	5	0	766	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	4.0			4.0	8.5	8.5			8.5	
Lane Util. Factor		1.00	1.00			1.00	1.00	0.95			0.95	
Frpb, ped/bikes		1.00	0.97			0.98	1.00	1.00			0.99	
Flpb, ped/bikes		1.00	1.00			1.00	0.99	1.00			1.00	
Frt		1.00	0.85			0.86	1.00	1.00			0.98	
Flt Protected		0.95	1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1762	1535			1585	1749	3536			3443	
Flt Permitted		0.95	1.00			1.00	0.32	1.00			1.00	
Satd. Flow (perm)		1762	1535			1585	594	3536			3443	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	161	0	31	0	0	10	23	872	5	0	766	115
RTOR Reduction (vph)	0	0	24	0	0	8	0	1	0	0	14	0
Lane Group Flow (vph)	0	161	7	0	0	2	23	876	0	0	867	0
Confl. Peds. (#/hr)	3		14	14		3	15					15
Turn Type	custom		custom			custom	Perm					
Protected Phases		2						10			7 10	
Permitted Phases	1		1			3	10					
Actuated Green, G (s)		13.7	18.2			18.5	31.8	31.8			54.3	
Effective Green, g (s)		13.7	18.2			18.5	31.8	31.8			54.3	
Actuated g/C Ratio		0.16	0.21			0.22	0.37	0.37			0.64	
Clearance Time (s)		8.5	4.0			4.0	8.5	8.5				
Vehicle Extension (s)		2.0	2.0			2.0	2.0	2.0				
Lane Grp Cap (vph)		284	329			345	222	1323			2199	
v/s Ratio Prot								c0.25			c0.25	
v/s Ratio Perm		0.09	0.00			0.00	0.04					
v/c Ratio		0.57	0.02			0.01	0.10	0.66			0.39	
Uniform Delay, d1		32.9	26.4			26.0	17.3	22.1			7.4	
Progression Factor		1.00	1.00			1.00	0.35	0.42			0.12	
Incremental Delay, d2		8.0	0.0			0.0	0.9	2.5			0.5	
Delay (s)		40.9	26.4			26.1	7.0	11.8			1.4	
Level of Service		D	C			C	A	B			A	
Approach Delay (s)		38.5			26.1			11.7			1.4	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: 51st St. & Broadway

5/22/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	184	369	112	217	512	364	155	573	194	65	357	319
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			0.91			0.86	0.86
Frpb, ped/bikes	1.00	0.99		1.00	0.98			0.98			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.97		1.00	0.94			0.97			1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	0.98
Satd. Flow (prot)	1770	3385		1770	3268			4775			1522	4712
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.95	0.98
Satd. Flow (perm)	1770	3385		1770	3268			4775			1522	4712
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	184	369	112	217	512	364	155	573	194	65	357	319
RTOR Reduction (vph)	0	26	0	0	118	0	0	44	0	0	0	0
Lane Group Flow (vph)	184	455	0	217	758	0	0	879	0	0	211	530
Confl. Peds. (#/hr)	20		23	23		20	22		66		66	
Confl. Bikes (#/hr)			1			2			1			
Turn Type	Prot			Prot			Split			Split	Split	
Protected Phases	1	6		5	2		8	8		4	4	4
Permitted Phases												
Actuated Green, G (s)	14.2	27.3		14.9	28.0			27.5			24.3	24.3
Effective Green, g (s)	14.2	27.3		14.9	28.0			27.5			24.3	24.3
Actuated g/C Ratio	0.13	0.25		0.14	0.25			0.25			0.22	0.22
Clearance Time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	228	840		240	832			1194			336	1041
v/s Ratio Prot	0.10	0.13		c0.12	c0.23			c0.18			c0.14	0.11
v/s Ratio Perm												
v/c Ratio	0.81	0.54		0.90	0.91			0.74			0.63	0.51
Uniform Delay, d1	46.6	35.9		46.8	39.8			37.9			38.8	37.6
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	18.5	0.7		33.5	14.1			4.1			8.6	1.8
Delay (s)	65.1	36.6		80.3	53.9			42.0			47.4	39.4
Level of Service	E	D		F	D			D			D	D
Approach Delay (s)		44.5			59.1			42.0				40.4
Approach LOS		D			E			D				D

Intersection Summary			
HCM Average Control Delay	47.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	163
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.95
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1501
Flt Permitted	1.00
Satd. Flow (perm)	1501
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	163
RTOR Reduction (vph)	127
Lane Group Flow (vph)	36
Confl. Peds. (#/hr)	22
Confl. Bikes (#/hr)	8
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	24.3
Effective Green, g (s)	24.3
Actuated g/C Ratio	0.22
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	332
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.11
Uniform Delay, d1	34.2
Progression Factor	1.00
Incremental Delay, d2	0.7
Delay (s)	34.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL2	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	194	181	121	29	104	28	100	531	34	34	546	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95			0.91	
Frpb, ped/bikes	1.00	0.98			0.99		1.00	1.00			0.99	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	
Frt	1.00	0.94			0.97		1.00	0.99			0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3272			3371		1763	3494			4854	
Flt Permitted	0.52	1.00			0.87		0.33	1.00			0.90	
Satd. Flow (perm)	960	3272			2949		614	3494			4360	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	181	121	29	104	28	100	531	34	34	546	155
RTOR Reduction (vph)	0	91	0	0	0	0	0	4	0	0	40	0
Lane Group Flow (vph)	194	211	0	0	161	0	100	561	0	0	695	0
Confl. Peds. (#/hr)			31	31		48	46		59	59		46
Confl. Bikes (#/hr)			4			6			7			8
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	7	4			8		1	6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	20.0	20.0			13.0		52.0	52.0			45.8	
Effective Green, g (s)	20.0	20.0			13.0		52.0	52.0			45.8	
Actuated g/C Ratio	0.25	0.25			0.16		0.65	0.65			0.57	
Clearance Time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	281	818			479		445	2271			2496	
v/s Ratio Prot	c0.03	0.06					0.01	c0.16				
v/s Ratio Perm	c0.14				0.05		0.14				c0.16	
v/c Ratio	0.69	0.26			0.34		0.22	0.25			0.28	
Uniform Delay, d1	27.0	24.1			29.7		5.3	5.8			8.7	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	7.1	0.2			0.4		0.3	0.3			0.3	
Delay (s)	34.1	24.2			30.1		5.6	6.1			9.0	
Level of Service	C	C			C		A	A			A	
Approach Delay (s)		28.1			30.1			6.0			9.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	117.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SWR2
Lane Configurations	
Volume (vph)	57
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.95
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	1526
Flt Permitted	1.00
Satd. Flow (perm)	1526
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	57
RTOR Reduction (vph)	24
Lane Group Flow (vph)	33
Confl. Peds. (#/hr)	48
Confl. Bikes (#/hr)	6
Turn Type	custom
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	45.8
Effective Green, g (s)	45.8
Actuated g/C Ratio	0.57
Clearance Time (s)	5.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	874
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.04
Uniform Delay, d1	7.5
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	7.5
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	158	59	49	262	157	90	439	58	103	407	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.98	1.00		0.98	1.00	
Frt		0.97			0.95		1.00	0.98		1.00	0.97	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		4799			4701		1737	3454		1737	3415	
Flt Permitted		0.72			0.85		0.47	1.00		0.47	1.00	
Satd. Flow (perm)		3524			4035		865	3454		859	3415	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	107	158	59	49	262	157	90	439	58	103	407	84
RTOR Reduction (vph)	0	48	0	0	127	0	0	8	0	0	13	0
Lane Group Flow (vph)	0	276	0	0	341	0	90	489	0	103	478	0
Confl. Peds. (#/hr)	47		21	21		47	40		41	41		40
Confl. Bikes (#/hr)			1			3			27			29
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		14.3			14.3		50.2	50.2		50.2	50.2	
Effective Green, g (s)		14.3			14.3		50.2	50.2		50.2	50.2	
Actuated g/C Ratio		0.19			0.19		0.67	0.67		0.67	0.67	
Clearance Time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		672			769		579	2312		575	2286	
v/s Ratio Prot								c0.14			0.14	
v/s Ratio Perm		0.08			c0.08		0.10			0.12		
v/c Ratio		0.41			0.44		0.16	0.21		0.18	0.21	
Uniform Delay, d1		26.7			26.8		4.6	4.8		4.7	4.8	
Progression Factor		1.00			1.00		0.77	0.80		0.56	0.52	
Incremental Delay, d2		0.1			0.1		0.6	0.2		0.6	0.2	
Delay (s)		26.8			27.0		4.1	4.0		3.2	2.7	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		26.8			27.0			4.0			2.8	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	277	40	72	343	302	80	327	44	271	383	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.89	1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1559	1770	3539	1412	1770	3466		1770	3539	1489
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1559	1770	3539	1412	1770	3466		1770	3539	1489
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	74	277	40	72	343	302	80	327	44	271	383	68
RTOR Reduction (vph)	0	0	26	0	0	200	0	12	0	0	0	45
Lane Group Flow (vph)	74	277	14	72	343	102	80	359	0	271	383	23
Confl. Peds. (#/hr)	72		2	2		72	42		2	2		42
Confl. Bikes (#/hr)			1			8			11	11		
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	7.5	33.9	33.9	7.5	33.9	33.9	7.1	22.7		17.9	33.5	33.5
Effective Green, g (s)	7.5	33.9	33.9	7.5	33.9	33.9	7.1	22.7		17.9	33.5	33.5
Actuated g/C Ratio	0.08	0.34	0.34	0.08	0.34	0.34	0.07	0.23		0.18	0.34	0.34
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	133	1200	529	133	1200	479	126	787		317	1186	499
v/s Ratio Prot	c0.04	0.08		0.04	c0.10		0.05	c0.10		c0.15	0.11	
v/s Ratio Perm			0.01			0.07						0.02
v/c Ratio	0.56	0.23	0.03	0.54	0.29	0.21	0.63	0.46		0.85	0.32	0.05
Uniform Delay, d1	44.6	23.7	22.0	44.6	24.2	23.6	45.2	33.3		39.8	24.8	22.5
Progression Factor	1.00	1.00	1.00	1.02	1.36	4.16	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.0	0.4	0.1	4.3	0.6	1.0	10.0	0.4		19.6	0.2	0.0
Delay (s)	49.6	24.2	22.1	49.8	33.5	98.9	55.2	33.8		59.4	25.0	22.5
Level of Service	D	C	C	D	C	F	E	C		E	C	C
Approach Delay (s)		28.8			62.7			37.6			37.6	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM Average Control Delay	44.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	575	25	52	521	208	39	137	151	199	73	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.96			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3514		1770	4722			1842	1340	1770	1707	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3514		1770	4722			1842	1340	1770	1707	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	575	25	52	521	208	39	137	151	199	73	78
RTOR Reduction (vph)	0	2	0	0	52	0	0	0	128	0	43	0
Lane Group Flow (vph)	73	598	0	52	677	0	0	176	23	199	108	0
Confl. Peds. (#/hr)	33					33			67	67		
Confl. Bikes (#/hr)			2						1			1
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	6.5	46.0		5.7	45.2			15.0	15.0	16.3	16.3	
Effective Green, g (s)	6.5	46.0		5.7	45.2			15.0	15.0	16.3	16.3	
Actuated g/C Ratio	0.06	0.46		0.06	0.45			0.15	0.15	0.16	0.16	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	115	1616		101	2134			276	201	289	278	
v/s Ratio Prot	c0.04	c0.17		0.03	0.14			c0.10		c0.11	0.06	
v/s Ratio Perm									0.02			
v/c Ratio	0.63	0.37		0.51	0.32			0.64	0.11	0.69	0.39	
Uniform Delay, d1	45.6	17.6		45.8	17.5			39.9	36.7	39.5	37.4	
Progression Factor	1.21	1.11		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.5	0.6		1.8	0.4			3.5	0.1	5.4	0.3	
Delay (s)	62.5	20.1		47.6	17.9			43.5	36.8	44.8	37.7	
Level of Service	E	C		D	B			D	D	D	D	
Approach Delay (s)		24.7			19.9			40.4			41.8	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	120	17	409	191	66	464
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		8.5	8.5	8.5	8.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frpb, ped/bikes	0.99		1.00	0.95	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	0.99	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3378		3539	1499	1759	3539
Flt Permitted	0.96		1.00	1.00	0.51	1.00
Satd. Flow (perm)	3378		3539	1499	948	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	17	409	191	66	464
RTOR Reduction (vph)	13	0	0	156	0	0
Lane Group Flow (vph)	124	0	409	35	66	464
Confl. Peds. (#/hr)		6		8	8	
Confl. Bikes (#/hr)		8		26		
Turn Type				custom	Perm	
Protected Phases	8		2 10			10
Permitted Phases				2	10	
Actuated Green, G (s)	16.5		45.0	13.7	22.8	22.8
Effective Green, g (s)	16.5		45.0	13.7	22.8	22.8
Actuated g/C Ratio	0.22		0.60	0.18	0.30	0.30
Clearance Time (s)	5.0			8.5	8.5	8.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	743		2123	274	288	1076
v/s Ratio Prot	c0.04		c0.12			c0.13
v/s Ratio Perm				0.02	0.07	
v/c Ratio	0.17		0.19	0.13	0.23	0.43
Uniform Delay, d1	23.7		6.8	25.6	19.5	20.9
Progression Factor	1.00		0.05	3.21	1.00	1.00
Incremental Delay, d2	0.0		0.2	0.9	1.8	1.3
Delay (s)	23.7		0.5	83.2	21.4	22.2
Level of Service	C		A	F	C	C
Approach Delay (s)	23.7		26.8			22.1
Approach LOS	C		C			C

Intersection Summary			
HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	10	27	26	8	17	32	574	20	31	596	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.94			0.95		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1698			1713		1762	3515		1751	3517	
Flt Permitted		0.90			0.88		0.40	1.00		0.41	1.00	
Satd. Flow (perm)		1558			1548		734	3515		752	3517	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	28	10	27	26	8	17	32	574	20	31	596	21
RTOR Reduction (vph)	0	18	0	0	12	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	47	0	0	39	0	32	591	0	31	613	0
Confl. Peds. (#/hr)	10		13	13		10	12		28	28		12
Confl. Bikes (#/hr)									11			12
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		42.0	42.0		42.0	42.0	
Effective Green, g (s)		24.0			24.0		42.0	42.0		42.0	42.0	
Actuated g/C Ratio		0.32			0.32		0.56	0.56		0.56	0.56	
Clearance Time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		499			495		411	1968		421	1970	
v/s Ratio Prot								0.17			c0.17	
v/s Ratio Perm		c0.03			0.03		0.04			0.04		
v/c Ratio		0.09			0.08		0.08	0.30		0.07	0.31	
Uniform Delay, d1		17.9			17.8		7.6	8.7		7.6	8.8	
Progression Factor		1.00			1.00		0.39	0.35		1.42	1.14	
Incremental Delay, d2		0.4			0.3		0.4	0.4		0.3	0.4	
Delay (s)		18.2			18.1		3.3	3.4		11.1	10.4	
Level of Service		B			B		A	A		B	B	
Approach Delay (s)		18.2			18.1			3.4			10.5	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	64	36	62	59	37	47	493	52	59	486	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		0.99	1.00		0.96	1.00	
Frt		0.96			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1741			1731		1754	3447		1700	3513	
Flt Permitted		0.93			0.85		0.46	1.00		0.43	1.00	
Satd. Flow (perm)		1642			1494		843	3447		774	3513	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	23	64	36	62	59	37	47	493	52	59	486	18
RTOR Reduction (vph)	0	20	0	0	15	0	0	10	0	0	4	0
Lane Group Flow (vph)	0	103	0	0	143	0	47	535	0	59	500	0
Confl. Peds. (#/hr)	32		35	35		32	20		93	93		20
Confl. Bikes (#/hr)			4			8			33			33
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		41.0	41.0		41.0	41.0	
Effective Green, g (s)		24.0			24.0		41.0	41.0		41.0	41.0	
Actuated g/C Ratio		0.32			0.32		0.55	0.55		0.55	0.55	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		525			478		461	1884		423	1920	
v/s Ratio Prot								c0.16			0.14	
v/s Ratio Perm		0.06			c0.10		0.06			0.08		
v/c Ratio		0.20			0.30		0.10	0.28		0.14	0.26	
Uniform Delay, d1		18.5			19.2		8.2	9.1		8.3	9.0	
Progression Factor		1.00			1.00		1.04	1.19		0.88	0.99	
Incremental Delay, d2		0.8			1.6		0.4	0.4		0.7	0.3	
Delay (s)		19.3			20.8		8.9	11.3		8.0	9.3	
Level of Service		B			C		A	B		A	A	
Approach Delay (s)		19.3			20.8			11.1			9.1	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM Average Control Delay	12.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	169	95	30	242	84	118	393	29	76	386	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.98	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3321		1770	3371		1740	3490		1740	3331	
Flt Permitted	0.95	1.00		0.95	1.00		0.41	1.00		0.49	1.00	
Satd. Flow (perm)	1770	3321		1770	3371		758	3490		894	3331	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	169	95	30	242	84	118	393	29	76	386	154
RTOR Reduction (vph)	0	67	0	0	50	0	0	6	0	0	48	0
Lane Group Flow (vph)	113	197	0	30	276	0	118	416	0	76	492	0
Confl. Peds. (#/hr)	13		7	7		13	45		37	37		45
Confl. Bikes (#/hr)			5			12			22			24
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.5	22.8		2.8	18.1		35.9	35.9		35.9	35.9	
Effective Green, g (s)	8.0	22.3		3.3	17.6		37.4	37.4		37.4	37.4	
Actuated g/C Ratio	0.11	0.30		0.04	0.23		0.50	0.50		0.50	0.50	
Clearance Time (s)	4.5	3.5		4.5	3.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	189	987		78	791		378	1740		446	1661	
v/s Ratio Prot	c0.06	0.06		0.02	c0.08			0.12			0.15	
v/s Ratio Perm							c0.16			0.09		
v/c Ratio	0.60	0.20		0.38	0.35		0.31	0.24		0.17	0.30	
Uniform Delay, d1	32.0	19.7		34.9	23.9		11.2	10.7		10.3	11.1	
Progression Factor	1.00	1.00		1.03	1.02		1.00	0.98		0.99	1.00	
Incremental Delay, d2	3.4	0.0		1.1	0.1		2.1	0.3		0.8	0.5	
Delay (s)	35.3	19.7		36.9	24.6		13.3	10.8		11.0	11.5	
Level of Service	D	B		D	C		B	B		B	B	
Approach Delay (s)		24.4			25.6			11.3			11.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	149	44	22	193	184	60	358	16	110	419	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99			1.00	0.95	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.98	1.00			1.00	1.00	0.99	1.00		0.99	1.00	
Frt	1.00	0.97			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1740	3399			3520	1504	1751	3509		1745	3420	
Flt Permitted	0.62	1.00			0.92	1.00	0.43	1.00		0.51	1.00	
Satd. Flow (perm)	1131	3399			3251	1504	784	3509		945	3420	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	93	149	44	22	193	184	60	358	16	110	419	86
RTOR Reduction (vph)	0	25	0	0	0	104	0	4	0	0	23	0
Lane Group Flow (vph)	93	168	0	0	215	80	60	370	0	110	482	0
Confl. Peds. (#/hr)	30		8	8		30	33		35	35		33
Confl. Bikes (#/hr)			13			32			25			32
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		3			4			1			1	
Permitted Phases	3			4		4	1			1		
Actuated Green, G (s)	31.0	31.0			31.0	31.0	33.0	33.0		33.0	33.0	
Effective Green, g (s)	32.5	32.5			32.5	32.5	34.5	34.5		34.5	34.5	
Actuated g/C Ratio	0.43	0.43			0.43	0.43	0.46	0.46		0.46	0.46	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Grp Cap (vph)	490	1473			1409	652	361	1614		435	1573	
v/s Ratio Prot		0.05						0.11			c0.14	
v/s Ratio Perm	c0.08				0.07	0.05	0.08			0.12		
v/c Ratio	0.19	0.11			0.15	0.12	0.17	0.23		0.25	0.31	
Uniform Delay, d1	13.1	12.7			12.9	12.7	11.8	12.2		12.4	12.7	
Progression Factor	1.23	1.21			1.00	1.00	1.99	2.03		1.16	1.23	
Incremental Delay, d2	0.9	0.2			0.2	0.4	1.0	0.3		1.4	0.5	
Delay (s)	17.0	15.5			13.1	13.1	24.6	25.1		15.7	16.1	
Level of Service	B	B			B	B	C	C		B	B	
Approach Delay (s)		16.0			13.1			25.0			16.0	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	69	212	31	15	50	14	185	198	12	126	301	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00			1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.59			1.00	1.00	0.76		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85			1.00	1.00	0.85		1.00	0.97	
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	927			1770	1863	1208		3433	3388	
Flt Permitted	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	927			1770	1863	1208		3433	3388	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	69	212	31	15	50	14	185	198	12	126	301	65
RTOR Reduction (vph)	0	0	11	0	0	0	0	159	0	0	10	0
Lane Group Flow (vph)	69	212	35	0	0	64	185	39	0	138	356	0
Confl. Peds. (#/hr)			38	38				92				45
Confl. Bikes (#/hr)			22	22				38				7
Turn Type	Prot		Perm		Prot	Prot		Perm	Prot	Prot		
Protected Phases	10	4			3	3	8		5	5	2	
Permitted Phases			4					8				
Actuated Green, G (s)	23.8	18.8	18.8			7.9	31.7	31.7		11.8	67.2	
Effective Green, g (s)	23.8	18.8	18.8			7.9	31.7	31.7		11.8	67.2	
Actuated g/C Ratio	0.15	0.12	0.12			0.05	0.20	0.20		0.07	0.42	
Clearance Time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0			3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	263	416	109			87	369	239		253	1423	
v/s Ratio Prot	c0.04	0.06				c0.04	c0.10			0.04	c0.10	
v/s Ratio Perm			0.04					0.03				
v/c Ratio	0.26	0.51	0.32			0.74	0.50	0.16		0.55	0.25	
Uniform Delay, d1	60.3	66.3	64.8			75.0	57.1	53.2		71.5	30.1	
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.0	1.7			27.3	1.1	0.3		2.4	0.4	
Delay (s)	60.9	67.3	66.5			102.3	58.2	53.5		73.9	30.5	
Level of Service	E	E	E			F	E	D		E	C	
Approach Delay (s)		65.8					62.4				42.4	
Approach LOS		E					E				D	

Intersection Summary			
HCM Average Control Delay	52.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	152	263	21	63
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	0.96		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.96		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3274		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3274		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	152	263	21	63
RTOR Reduction (vph)	0	10	0	0
Lane Group Flow (vph)	152	337	0	0
Confl. Peds. (#/hr)			46	46
Confl. Bikes (#/hr)			6	6
Turn Type	Prot			
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	17.3	72.7		
Effective Green, g (s)	17.3	72.7		
Actuated g/C Ratio	0.11	0.45		
Clearance Time (s)	5.0	5.0		
Vehicle Extension (s)	3.0	3.0		
Lane Grp Cap (vph)	191	1488		
v/s Ratio Prot	c0.09	0.10		
v/s Ratio Perm				
v/c Ratio	0.80	0.23		
Uniform Delay, d1	69.6	26.5		
Progression Factor	1.00	1.00		
Incremental Delay, d2	20.1	0.4		
Delay (s)	89.7	26.9		
Level of Service	F	C		
Approach Delay (s)		46.0		
Approach LOS		D		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	77	340	57	72	265	42	82	321	110	57	298	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00	0.93	1.00	0.99	
Flpb, ped/bikes	0.97	1.00			0.99		0.96	1.00	1.00	0.96	1.00	
Frt	1.00	0.98			0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1715	3414			3391		1704	3539	1465	1701	3388	
Flt Permitted	0.46	1.00			0.80		0.53	1.00	1.00	0.56	1.00	
Satd. Flow (perm)	831	3414			2731		956	3539	1465	998	3388	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	77	340	57	72	265	42	82	321	110	57	298	69
RTOR Reduction (vph)	0	25	0	0	17	0	0	0	42	0	19	0
Lane Group Flow (vph)	77	372	0	0	362	0	82	321	68	57	348	0
Confl. Peds. (#/hr)	66		96	96		66	74		73	73		74
Confl. Bikes (#/hr)			12			12			10			23
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	19.8	19.8			19.8		44.2	44.2	44.2	44.2	44.2	
Effective Green, g (s)	19.8	19.8			19.8		44.2	44.2	44.2	44.2	44.2	
Actuated g/C Ratio	0.28	0.28			0.28		0.61	0.61	0.61	0.61	0.61	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	229	939			751		587	2173	899	613	2080	
v/s Ratio Prot		0.11						0.09			c0.10	
v/s Ratio Perm	0.09				c0.13		0.09		0.05	0.06		
v/c Ratio	0.34	0.40			0.48		0.14	0.15	0.08	0.09	0.17	
Uniform Delay, d1	20.9	21.2			21.8		5.9	5.9	5.6	5.7	6.0	
Progression Factor	1.00	1.00			0.98		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.1			0.2		0.5	0.1	0.2	0.3	0.2	
Delay (s)	21.2	21.3			21.5		6.4	6.0	5.8	6.0	6.2	
Level of Service	C	C			C		A	A	A	A	A	
Approach Delay (s)		21.3			21.5			6.0			6.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
61: Hawthorne Ave. & Broadway

5/22/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	0	19	0	0	16	30	547	6	4	516	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	4.0			4.0	8.5	8.5			8.5	
Lane Util. Factor		1.00	1.00			1.00	1.00	0.95			0.95	
Frpb, ped/bikes		1.00	0.98			0.99	1.00	1.00			0.99	
Flpb, ped/bikes		1.00	1.00			1.00	0.98	1.00			1.00	
Frt		1.00	0.85			0.86	1.00	1.00			0.99	
Flt Protected		0.95	1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1767	1552			1590	1737	3530			3486	
Flt Permitted		0.95	1.00			1.00	0.44	1.00			0.95	
Satd. Flow (perm)		1767	1552			1590	811	3530			3317	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	0	19	0	0	16	30	547	6	4	516	36
RTOR Reduction (vph)	0	0	14	0	0	12	0	1	0	0	7	0
Lane Group Flow (vph)	0	30	5	0	0	4	30	552	0	0	549	0
Confl. Peds. (#/hr)	1		6	6		1	17		18	18		17
Confl. Bikes (#/hr)			1						31			32
Turn Type	custom		custom			custom	Perm			Perm		
Protected Phases		2						10			7 10	
Permitted Phases	1		1			3	10			7 10		
Actuated Green, G (s)		13.7	18.2			17.5	22.8	22.8			44.3	
Effective Green, g (s)		13.7	18.2			17.5	22.8	22.8			44.3	
Actuated g/C Ratio		0.18	0.24			0.23	0.30	0.30			0.59	
Clearance Time (s)		8.5	4.0			4.0	8.5	8.5				
Vehicle Extension (s)		2.0	2.0			2.0	2.0	2.0				
Lane Grp Cap (vph)		323	377			371	247	1073			1959	
v/s Ratio Prot								c0.16				
v/s Ratio Perm		0.02	0.00			0.00	0.04				c0.17	
v/c Ratio		0.09	0.01			0.01	0.12	0.51			0.28	
Uniform Delay, d1		25.5	21.6			22.1	18.9	21.5			7.5	
Progression Factor		1.00	1.00			1.00	0.52	0.47			0.14	
Incremental Delay, d2		0.6	0.0			0.0	1.0	1.7			0.3	
Delay (s)		26.1	21.6			22.1	10.8	11.8			1.4	
Level of Service		C	C			C	B	B			A	
Approach Delay (s)		24.3			22.1			11.7			1.4	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix B4

LOS Calculation Worksheets
Existing Plus Project Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	245	716	84	152	367	348	108	808	166	70	410	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			0.91			0.86	0.86
Frpb, ped/bikes	1.00	1.00		1.00	0.98			0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.93			0.98			1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.95	0.98
Satd. Flow (prot)	1770	3474		1770	3228			4900			1522	4695
Flt Permitted	0.95	1.00		0.95	1.00			1.00			0.95	0.98
Satd. Flow (perm)	1770	3474		1770	3228			4900			1522	4695
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	245	716	84	152	367	348	108	808	166	70	410	269
RTOR Reduction (vph)	0	8	0	0	161	0	0	23	0	0	0	0
Lane Group Flow (vph)	245	792	0	152	554	0	0	1059	0	0	238	511
Confl. Peds. (#/hr)			7			16			29			
Confl. Bikes (#/hr)			6			3			5			
Turn Type	Prot			Prot			Split			Split	Split	
Protected Phases	1	6		5	2		8	8		4	4	4
Permitted Phases												
Actuated Green, G (s)	15.0	27.9		13.3	26.2			27.5			25.3	25.3
Effective Green, g (s)	15.0	27.9		13.3	26.2			27.5			25.3	25.3
Actuated g/C Ratio	0.14	0.25		0.12	0.24			0.25			0.23	0.23
Clearance Time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	241	881		214	769			1225			350	1080
v/s Ratio Prot	c0.14	c0.23		0.09	0.17			c0.22			c0.16	0.11
v/s Ratio Perm												
v/c Ratio	1.02	0.90		0.71	0.72			0.86			0.68	0.47
Uniform Delay, d1	47.5	39.7		46.5	38.5			39.5			38.7	36.6
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	62.3	11.9		10.6	3.3			8.2			10.2	1.5
Delay (s)	109.8	51.5		57.1	41.9			47.7			48.9	38.1
Level of Service	F	D		E	D			D			D	D
Approach Delay (s)		65.2			44.5			47.7				40.5
Approach LOS		E			D			D				D

Intersection Summary			
HCM Average Control Delay	50.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	103
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1543
Flt Permitted	1.00
Satd. Flow (perm)	1543
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	103
RTOR Reduction (vph)	79
Lane Group Flow (vph)	24
Confl. Peds. (#/hr)	6
Confl. Bikes (#/hr)	5
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	25.3
Effective Green, g (s)	25.3
Actuated g/C Ratio	0.23
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	355
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.07
Uniform Delay, d1	33.1
Progression Factor	1.00
Incremental Delay, d2	0.4
Delay (s)	33.5
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL2	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	276	268	106	33	146	54	96	852	47	22	372	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95			0.91	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00			0.99	
Flpb, ped/bikes	1.00	1.00			1.00		0.99	1.00			1.00	
Frt	1.00	0.96			0.97		1.00	0.99			0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3359			3362		1756	3501			4898	
Flt Permitted	0.44	1.00			0.87		0.44	1.00			0.89	
Satd. Flow (perm)	819	3359			2944		816	3501			4351	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	276	268	106	33	146	54	96	852	47	22	372	80
RTOR Reduction (vph)	0	70	0	0	0	0	0	3	0	0	27	0
Lane Group Flow (vph)	276	304	0	0	233	0	96	896	0	0	447	0
Confl. Peds. (#/hr)			17	17		22	46		52	52		46
Confl. Bikes (#/hr)			7			3			14			10
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	7	4			8		1	6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	21.4	21.4			14.4		50.6	50.6			44.4	
Effective Green, g (s)	21.4	21.4			14.4		50.6	50.6			44.4	
Actuated g/C Ratio	0.27	0.27			0.18		0.63	0.63			0.55	
Clearance Time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	267	899			530		554	2214			2415	
v/s Ratio Prot	c0.05	0.09					0.01	c0.26				
v/s Ratio Perm	c0.23				0.08		0.10				0.10	
v/c Ratio	1.03	0.34			0.44		0.17	0.40			0.19	
Uniform Delay, d1	29.4	23.6			29.2		5.8	7.3			8.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	64.1	0.2			0.6		0.1	0.6			0.2	
Delay (s)	93.5	23.8			29.8		5.9	7.8			9.0	
Level of Service	F	C			C		A	A			A	
Approach Delay (s)		53.4			29.8			7.6			9.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SWR2
Lane Configurations	
Volume (vph)	17
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	1611
Flt Permitted	1.00
Satd. Flow (perm)	1611
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	17
RTOR Reduction (vph)	8
Lane Group Flow (vph)	9
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Turn Type	custom
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	44.4
Effective Green, g (s)	44.4
Actuated g/C Ratio	0.55
Clearance Time (s)	5.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	894
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.01
Uniform Delay, d1	8.0
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	8.0
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	327	167	116	272	95	201	519	59	192	557	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		0.99	1.00	
Frt		0.95			0.97		1.00	0.98		1.00	0.98	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		4734			4797		1749	3470		1746	3456	
Flt Permitted		0.82			0.73		0.40	1.00		0.43	1.00	
Satd. Flow (perm)		3920			3551		740	3470		795	3456	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	327	167	116	272	95	201	519	59	192	557	79
RTOR Reduction (vph)	0	69	0	0	65	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	485	0	0	418	0	201	574	0	192	630	0
Confl. Peds. (#/hr)	55		54	54		55	37		38	38		37
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		15.0			15.0		39.4	39.4		39.4	39.4	
Effective Green, g (s)		15.0			15.0		39.4	39.4		39.4	39.4	
Actuated g/C Ratio		0.23			0.23		0.61	0.61		0.61	0.61	
Clearance Time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		906			821		449	2107		483	2098	
v/s Ratio Prot								0.17			0.18	
v/s Ratio Perm		c0.12			0.12		c0.27			0.24		
v/c Ratio		0.54			0.51		0.45	0.27		0.40	0.30	
Uniform Delay, d1		21.9			21.7		6.9	6.0		6.6	6.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2		0.3	0.0		0.2	0.0	
Delay (s)		22.2			21.9		7.1	6.0		6.8	6.2	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		22.2			21.9			6.3			6.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	64.9	Sum of lost time (s)	10.5
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	640	66	103	426	182	146	637	110	228	446	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.92	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1500	1770	3539	1457	1770	3421		1770	3539	1535
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1500	1770	3539	1457	1770	3421		1770	3539	1535
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	113	640	66	103	426	182	146	637	110	228	446	36
RTOR Reduction (vph)	0	0	46	0	0	127	0	13	0	0	0	25
Lane Group Flow (vph)	113	640	20	103	426	55	146	734	0	228	446	11
Confl. Peds. (#/hr)			29			48			58			15
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	11.3	33.3	33.3	11.0	33.0	33.0	13.1	28.4		19.3	34.6	34.6
Effective Green, g (s)	11.3	33.3	33.3	11.0	33.0	33.0	13.1	28.4		19.3	34.6	34.6
Actuated g/C Ratio	0.10	0.30	0.30	0.10	0.30	0.30	0.12	0.26		0.18	0.31	0.31
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	182	1071	454	177	1062	437	211	883		311	1113	483
v/s Ratio Prot	c0.06	c0.18		0.06	0.12		0.08	c0.21		c0.13	0.13	
v/s Ratio Perm			0.01			0.04						0.01
v/c Ratio	0.62	0.60	0.04	0.58	0.40	0.12	0.69	0.83		0.73	0.40	0.02
Uniform Delay, d1	47.3	32.6	27.1	47.3	30.6	28.0	46.5	38.5		42.9	29.6	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	2.5	0.2	4.8	1.1	0.6	9.4	6.7		8.6	0.2	0.0
Delay (s)	53.7	35.1	27.3	52.1	31.8	28.6	55.9	45.3		51.5	29.8	26.1
Level of Service	D	D	C	D	C	C	E	D		D	C	C
Approach Delay (s)		37.0			33.9			47.0			36.6	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	39.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1053	81	106	622	214	72	199	348	217	110	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00	0.93	1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.96			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3461		1770	4800			1838	1477	1770	1701	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3461		1770	4800			1838	1477	1770	1701	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	1053	81	106	622	214	72	199	348	217	110	63
RTOR Reduction (vph)	0	5	0	0	49	0	0	0	209	0	22	0
Lane Group Flow (vph)	100	1129	0	106	787	0	0	271	139	217	151	0
Confl. Peds. (#/hr)	20		55	55		20	69		24	24		69
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	7.3	42.3		4.5	39.5			19.2	19.2	17.0	17.0	
Effective Green, g (s)	7.3	42.3		4.5	39.5			19.2	19.2	17.0	17.0	
Actuated g/C Ratio	0.07	0.42		0.04	0.40			0.19	0.19	0.17	0.17	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	129	1464		80	1896			353	284	301	289	
v/s Ratio Prot	0.06	c0.33		c0.06	0.16			c0.15		c0.12	0.09	
v/s Ratio Perm									0.09			
v/c Ratio	0.78	0.77		1.32	0.42			0.77	0.49	0.72	0.52	
Uniform Delay, d1	45.5	24.7		47.8	21.9			38.3	36.0	39.3	37.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	22.8	4.0		210.1	0.7			8.7	0.5	7.0	0.8	
Delay (s)	68.3	28.7		257.9	22.6			47.0	36.5	46.3	38.6	
Level of Service	E	C		F	C			D	D	D	D	
Approach Delay (s)		31.9			49.0			41.1			42.9	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	254	69	733	374	109	677
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		8.5	8.5	8.5	8.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frpb, ped/bikes	0.98		1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3311		3539	1562	1770	3539
Flt Permitted	0.96		1.00	1.00	0.37	1.00
Satd. Flow (perm)	3311		3539	1562	695	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	254	69	733	374	109	677
RTOR Reduction (vph)	30	0	0	166	0	0
Lane Group Flow (vph)	293	0	733	208	109	677
Confl. Peds. (#/hr)		23		1		
Turn Type				custom	Perm	
Protected Phases	8		2 10			10
Permitted Phases				2	10	
Actuated Green, G (s)	17.5		54.0	13.7	31.8	31.8
Effective Green, g (s)	17.5		54.0	13.7	31.8	31.8
Actuated g/C Ratio	0.21		0.64	0.16	0.37	0.37
Clearance Time (s)	5.0			8.5	8.5	8.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	682		2248	252	260	1324
v/s Ratio Prot	c0.09		0.21			c0.19
v/s Ratio Perm				c0.13	0.16	
v/c Ratio	0.43		0.33	0.83	0.42	0.51
Uniform Delay, d1	29.4		7.1	34.5	19.7	20.6
Progression Factor	1.00		0.06	1.48	1.00	1.00
Incremental Delay, d2	0.2		0.3	20.2	4.9	1.4
Delay (s)	29.6		0.7	71.3	24.7	22.0
Level of Service	C		A	E	C	C
Approach Delay (s)	29.6		24.6			22.4
Approach LOS	C		C			C

Intersection Summary			
HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	10	151	33	11	32	120	744	18	35	703	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98			0.99		1.00	1.00		0.99	1.00	
Frt		0.94			0.94		1.00	1.00		1.00	0.98	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1641			1681		1763	3523		1753	3451	
Flt Permitted		0.82			0.82		0.31	1.00		0.33	1.00	
Satd. Flow (perm)		1387			1407		574	3523		612	3451	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	10	151	33	11	32	120	744	18	35	703	112
RTOR Reduction (vph)	0	39	0	0	23	0	0	2	0	0	15	0
Lane Group Flow (vph)	0	277	0	0	53	0	120	760	0	35	800	0
Confl. Peds. (#/hr)	37		26	26		27	14		34	34		14
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		52.0	52.0		52.0	52.0	
Effective Green, g (s)		24.0			24.0		52.0	52.0		52.0	52.0	
Actuated g/C Ratio		0.28			0.28		0.61	0.61		0.61	0.61	
Clearance Time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		392			397		351	2155		374	2111	
v/s Ratio Prot								0.22			c0.23	
v/s Ratio Perm		c0.20			0.04		0.21			0.06		
v/c Ratio		0.71			0.13		0.34	0.35		0.09	0.38	
Uniform Delay, d1		27.3			22.7		8.1	8.2		6.8	8.3	
Progression Factor		1.00			1.00		0.30	0.30		2.43	2.42	
Incremental Delay, d2		10.3			0.7		2.4	0.4		0.5	0.5	
Delay (s)		37.6			23.4		4.8	2.9		17.0	20.6	
Level of Service		D			C		A	A		B	C	
Approach Delay (s)		37.6			23.4			3.1			20.5	
Approach LOS		D			C			A			C	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	131	74	54	67	35	45	826	95	97	770	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.97			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.98		0.98	1.00		0.99	1.00	
Frt		0.96			0.97		1.00	0.98		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1709			1726		1735	3469		1759	3518	
Flt Permitted		0.93			0.81		0.32	1.00		0.26	1.00	
Satd. Flow (perm)		1594			1425		578	3469		489	3518	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	131	74	54	67	35	45	826	95	97	770	21
RTOR Reduction (vph)	0	18	0	0	12	0	0	10	0	0	2	0
Lane Group Flow (vph)	0	229	0	0	144	0	45	911	0	97	789	0
Confl. Peds. (#/hr)	21		95	95		21	74		28	28		74
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		51.0	51.0		51.0	51.0	
Effective Green, g (s)		24.0			24.0		51.0	51.0		51.0	51.0	
Actuated g/C Ratio		0.28			0.28		0.60	0.60		0.60	0.60	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		450			402		347	2081		293	2111	
v/s Ratio Prot								c0.26			0.22	
v/s Ratio Perm		c0.14			0.10		0.08			0.20		
v/c Ratio		0.51			0.36		0.13	0.44		0.33	0.37	
Uniform Delay, d1		25.6			24.3		7.4	9.2		8.5	8.8	
Progression Factor		1.00			1.00		1.63	1.62		0.36	0.42	
Incremental Delay, d2		4.1			2.5		0.7	0.6		2.8	0.5	
Delay (s)		29.6			26.8		12.8	15.6		5.8	4.2	
Level of Service		C			C		B	B		A	A	
Approach Delay (s)		29.6			26.8			15.5			4.4	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: 27th St. & Telegraph Ave.

5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	315	127	43	503	104	187	461	62	120	510	349
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3347		1770	3432		1766	3465		1765	3288	
Flt Permitted	0.95	1.00		0.95	1.00		0.25	1.00		0.42	1.00	
Satd. Flow (perm)	1770	3347		1770	3432		466	3465		778	3288	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	128	315	127	43	503	104	187	461	62	120	510	349
RTOR Reduction (vph)	0	48	0	0	21	0	0	11	0	0	135	0
Lane Group Flow (vph)	128	394	0	43	586	0	187	512	0	120	724	0
Confl. Peds. (#/hr)			20			12	9		6	6		9
Confl. Bikes (#/hr)			9			3			25			13
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.2	25.8		4.6	21.2		41.1	41.1		41.1	41.1	
Effective Green, g (s)	9.7	25.3		5.1	20.7		42.6	42.6		42.6	42.6	
Actuated g/C Ratio	0.11	0.30		0.06	0.24		0.50	0.50		0.50	0.50	
Clearance Time (s)	4.5	3.5		4.5	3.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	202	996		106	836		234	1737		390	1648	
v/s Ratio Prot	c0.07	0.12		0.02	c0.17			0.15			0.22	
v/s Ratio Perm							c0.40			0.15		
v/c Ratio	0.63	0.40		0.41	0.70		0.80	0.29		0.31	0.44	
Uniform Delay, d1	36.0	23.8		38.5	29.3		17.6	12.4		12.5	13.6	
Progression Factor	1.00	1.00		0.92	1.39		0.96	0.85		0.89	0.86	
Incremental Delay, d2	4.7	0.1		0.9	2.1		23.6	0.4		2.0	0.8	
Delay (s)	40.7	23.9		36.3	42.9		40.6	11.0		13.2	12.5	
Level of Service	D	C		D	D		D	B		B	B	
Approach Delay (s)		27.6			42.4			18.8			12.6	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: 27th St. & Broadway

5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	329	79	27	390	220	136	687	28	155	675	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99			1.00	0.94	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00			1.00	1.00	0.99	1.00		0.99	1.00	
Frt	1.00	0.97			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1746	3419			3527	1495	1749	3510		1747	3438	
Flt Permitted	0.45	1.00			0.91	1.00	0.29	1.00		0.33	1.00	
Satd. Flow (perm)	832	3419			3221	1495	543	3510		600	3438	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	109	329	79	27	390	220	136	687	28	155	675	108
RTOR Reduction (vph)	0	25	0	0	0	99	0	3	0	0	15	0
Lane Group Flow (vph)	109	383	0	0	417	121	136	712	0	155	768	0
Confl. Peds. (#/hr)	30		12	12		30	50		49	49		50
Confl. Bikes (#/hr)			7			33			37			24
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		3			4			1			1	
Permitted Phases	3			4		4	1			1		
Actuated Green, G (s)	30.0	30.0			30.0	30.0	44.0	44.0		44.0	44.0	
Effective Green, g (s)	31.5	31.5			31.5	31.5	45.5	45.5		45.5	45.5	
Actuated g/C Ratio	0.37	0.37			0.37	0.37	0.54	0.54		0.54	0.54	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Grp Cap (vph)	308	1267			1194	554	291	1879		321	1840	
v/s Ratio Prot		0.11						0.20			0.22	
v/s Ratio Perm	c0.13				0.13	0.08	0.25			c0.26		
v/c Ratio	0.35	0.30			0.35	0.22	0.47	0.38		0.48	0.42	
Uniform Delay, d1	19.4	19.0			19.3	18.3	12.2	11.5		12.4	11.8	
Progression Factor	0.83	0.84			0.98	1.06	2.05	1.96		1.13	1.12	
Incremental Delay, d2	3.0	0.6			0.8	0.9	5.0	0.6		4.9	0.7	
Delay (s)	19.1	16.4			19.8	20.3	30.1	23.1		18.8	13.9	
Level of Service	B	B			B	C	C	C		B	B	
Approach Delay (s)		17.0			20.0			24.3			14.7	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	135.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	182	374	93	17	45	14	165	177	8	295	942	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00			1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.77			1.00	1.00	0.91		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85			1.00	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1226			1770	1863	1438		3433	3464	
Flt Permitted	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1226			1770	1863	1438		3433	3464	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	182	374	93	17	45	14	165	177	8	295	942	86
RTOR Reduction (vph)	0	0	4	0	0	0	0	142	0	0	4	0
Lane Group Flow (vph)	182	374	106	0	0	59	165	35	0	303	1024	0
Confl. Peds. (#/hr)			50					37				53
Confl. Bikes (#/hr)			2	2				1				2
Turn Type	Prot		Perm		Prot	Prot		Perm	Prot	Prot		
Protected Phases	10	4			3	3	8		5	5	2	
Permitted Phases			4					8				
Actuated Green, G (s)	25.3	19.4	19.4			7.5	31.9	31.9		15.5	64.3	
Effective Green, g (s)	25.3	19.4	19.4			7.5	31.9	31.9		15.5	64.3	
Actuated g/C Ratio	0.16	0.12	0.12			0.05	0.20	0.20		0.10	0.40	
Clearance Time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	2.0	2.0			2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	280	429	149			83	371	287		333	1392	
v/s Ratio Prot	c0.10	c0.11				c0.03	0.09			0.09	c0.30	
v/s Ratio Perm			0.09					0.02				
v/c Ratio	0.65	0.87	0.71			0.71	0.44	0.12		0.91	0.74	
Uniform Delay, d1	63.2	69.1	67.6			75.2	56.3	52.6		71.6	40.6	
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.3	16.9	11.9			21.1	0.3	0.1		26.9	3.5	
Delay (s)	68.5	86.0	79.4			96.3	56.6	52.6		98.5	44.1	
Level of Service	E	F	E			F	E	D		F	D	
Approach Delay (s)		80.1					60.7				56.5	
Approach LOS		F					E				E	

Intersection Summary			
HCM Average Control Delay	61.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	185	397	39	65
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	0.93		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.97		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3193		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3193		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	185	397	39	65
RTOR Reduction (vph)	0	7	0	0
Lane Group Flow (vph)	185	494	0	0
Confl. Peds. (#/hr)			122	122
Confl. Bikes (#/hr)			12	12
Turn Type	Prot			
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	18.5	67.3		
Effective Green, g (s)	18.5	67.3		
Actuated g/C Ratio	0.12	0.42		
Clearance Time (s)	5.0	5.0		
Vehicle Extension (s)	2.0	2.0		
Lane Grp Cap (vph)	205	1343		
v/s Ratio Prot	c0.10	c0.15		
v/s Ratio Perm				
v/c Ratio	0.90	0.37		
Uniform Delay, d1	69.9	31.8		
Progression Factor	1.00	1.00		
Incremental Delay, d2	36.4	0.8		
Delay (s)	106.3	32.5		
Level of Service	F	C		
Approach Delay (s)		52.4		
Approach LOS		D		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	630	89	71	341	40	240	576	133	85	399	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99			1.00		1.00	1.00	0.94	1.00	0.98	
Flpb, ped/bikes	1.00	1.00			1.00		0.97	1.00	1.00	0.98	1.00	
Frt	1.00	0.98			0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1763	3422			3441		1713	3539	1493	1742	3379	
Flt Permitted	0.39	1.00			0.65		0.45	1.00	1.00	0.41	1.00	
Satd. Flow (perm)	725	3422			2247		819	3539	1493	757	3379	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	630	89	71	341	40	240	576	133	85	399	100
RTOR Reduction (vph)	0	16	0	0	11	0	0	0	28	0	19	0
Lane Group Flow (vph)	106	703	0	0	441	0	240	576	105	85	480	0
Confl. Peds. (#/hr)	8		120	120		8	78		37	37		78
Confl. Bikes (#/hr)			8			5			27			6
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	25.1	25.1			25.1		51.9	51.9	51.9	51.9	51.9	
Effective Green, g (s)	25.1	25.1			25.1		51.9	51.9	51.9	51.9	51.9	
Actuated g/C Ratio	0.30	0.30			0.30		0.61	0.61	0.61	0.61	0.61	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	214	1010			664		500	2161	912	462	2063	
v/s Ratio Prot		c0.21						0.16			0.14	
v/s Ratio Perm	0.15				0.20		c0.29		0.07	0.11		
v/c Ratio	0.50	0.70			0.66		0.48	0.27	0.12	0.18	0.23	
Uniform Delay, d1	24.7	26.6			26.3		9.1	7.7	6.9	7.3	7.5	
Progression Factor	0.96	0.94			1.56		1.00	1.00	1.00	0.58	0.50	
Incremental Delay, d2	0.6	1.5			1.9		3.3	0.3	0.3	0.9	0.3	
Delay (s)	24.4	26.3			42.9		12.4	8.0	7.2	5.1	4.1	
Level of Service	C	C			D		B	A	A	A	A	
Approach Delay (s)		26.1			42.9			9.0			4.2	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	27	168	82	161	148	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	168	82	161	148	25
Pedestrians		50	50		50	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		4	4		4	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			116			
pX, platoon unblocked	0.98				0.98	0.98
vC, conflicting volume	293				484	262
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266				462	235
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				70	97
cM capacity (veh/h)	1217				490	722

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	195	243	173
Volume Left	27	0	148
Volume Right	0	161	25
cSH	1217	1700	514
Volume to Capacity	0.02	0.14	0.34
Queue Length 95th (ft)	2	0	37
Control Delay (s)	1.3	0.0	15.5
Lane LOS	A		C
Approach Delay (s)	1.3	0.0	15.5
Approach LOS			C

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	161	0	31	0	0	10	23	913	5	0	819	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	4.0			4.0	8.5	8.5			8.5	
Lane Util. Factor		1.00	1.00			1.00	1.00	0.95			0.95	
Frpb, ped/bikes		1.00	0.97			0.98	1.00	1.00			0.99	
Flpb, ped/bikes		1.00	1.00			1.00	0.99	1.00			1.00	
Frt		1.00	0.85			0.86	1.00	1.00			0.98	
Flt Protected		0.95	1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1762	1535			1585	1750	3536			3449	
Flt Permitted		0.95	1.00			1.00	0.31	1.00			1.00	
Satd. Flow (perm)		1762	1535			1585	564	3536			3449	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	161	0	31	0	0	10	23	913	5	0	819	115
RTOR Reduction (vph)	0	0	24	0	0	8	0	1	0	0	13	0
Lane Group Flow (vph)	0	161	7	0	0	2	23	917	0	0	921	0
Confl. Peds. (#/hr)	3		14	14		3	15					15
Turn Type	custom		custom			custom	Perm					
Protected Phases		2						10			7 10	
Permitted Phases	1		1			3	10					
Actuated Green, G (s)		13.7	18.2			18.5	31.8	31.8			54.3	
Effective Green, g (s)		13.7	18.2			18.5	31.8	31.8			54.3	
Actuated g/C Ratio		0.16	0.21			0.22	0.37	0.37			0.64	
Clearance Time (s)		8.5	4.0			4.0	8.5	8.5				
Vehicle Extension (s)		2.0	2.0			2.0	2.0	2.0				
Lane Grp Cap (vph)		284	329			345	211	1323			2203	
v/s Ratio Prot								c0.26			c0.27	
v/s Ratio Perm		0.09	0.00			0.00	0.04					
v/c Ratio		0.57	0.02			0.01	0.11	0.69			0.42	
Uniform Delay, d1		32.9	26.4			26.0	17.4	22.5			7.6	
Progression Factor		1.00	1.00			1.00	0.45	0.53			0.12	
Incremental Delay, d2		8.0	0.0			0.0	1.0	2.8			0.5	
Delay (s)		40.9	26.4			26.1	8.8	14.6			1.4	
Level of Service		D	C			C	A	B			A	
Approach Delay (s)		38.5			26.1			14.5			1.4	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: 51st St. & Broadway 5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	184	369	118	227	512	364	161	585	203	65	357	332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			0.91			0.86	0.86
Frpb, ped/bikes	1.00	0.99		1.00	0.98			0.98			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.96		1.00	0.94			0.97			1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	0.98
Satd. Flow (prot)	1770	3378		1770	3268			4771			1522	4714
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.95	0.98
Satd. Flow (perm)	1770	3378		1770	3268			4771			1522	4714
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	184	369	118	227	512	364	161	585	203	65	357	332
RTOR Reduction (vph)	0	29	0	0	118	0	0	44	0	0	0	0
Lane Group Flow (vph)	184	458	0	227	758	0	0	905	0	0	211	543
Confl. Peds. (#/hr)	20		23	23		20	22		66		66	
Confl. Bikes (#/hr)			1			2			1			
Turn Type	Prot			Prot			Split			Split	Split	
Protected Phases	1	6		5	2		8	8		4	4	4
Permitted Phases												
Actuated Green, G (s)	14.2	27.2		15.0	28.0			27.5			24.3	24.3
Effective Green, g (s)	14.2	27.2		15.0	28.0			27.5			24.3	24.3
Actuated g/C Ratio	0.13	0.25		0.14	0.25			0.25			0.22	0.22
Clearance Time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	228	835		241	832			1193			336	1041
v/s Ratio Prot	0.10	0.14		c0.13	c0.23			c0.19			c0.14	0.12
v/s Ratio Perm												
v/c Ratio	0.81	0.55		0.94	0.91			0.76			0.63	0.52
Uniform Delay, d1	46.6	36.1		47.1	39.8			38.2			38.8	37.7
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	18.5	0.7		42.0	14.1			4.5			8.6	1.9
Delay (s)	65.1	36.8		89.1	53.9			42.7			47.4	39.6
Level of Service	E	D		F	D			D			D	D
Approach Delay (s)		44.6			61.1			42.7				40.5
Approach LOS		D			E			D				D

Intersection Summary			
HCM Average Control Delay	48.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	163
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.95
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1501
Flt Permitted	1.00
Satd. Flow (perm)	1501
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	163
RTOR Reduction (vph)	127
Lane Group Flow (vph)	36
Confl. Peds. (#/hr)	22
Confl. Bikes (#/hr)	8
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	24.3
Effective Green, g (s)	24.3
Actuated g/C Ratio	0.22
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	332
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.11
Uniform Delay, d1	34.2
Progression Factor	1.00
Incremental Delay, d2	0.7
Delay (s)	34.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL2	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	194	181	123	29	104	28	102	557	34	34	575	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95			0.91	
Frpb, ped/bikes	1.00	0.98			0.99		1.00	1.00			0.99	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	
Frt	1.00	0.94			0.97		1.00	0.99			0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3270			3371		1763	3496			4863	
Flt Permitted	0.52	1.00			0.87		0.32	1.00			0.90	
Satd. Flow (perm)	960	3270			2948		593	3496			4366	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	181	123	29	104	28	102	557	34	34	575	155
RTOR Reduction (vph)	0	92	0	0	0	0	0	4	0	0	38	0
Lane Group Flow (vph)	194	212	0	0	161	0	102	588	0	0	726	0
Confl. Peds. (#/hr)			31	31		48	46		59	59		46
Confl. Bikes (#/hr)			4			6			7			8
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	7	4			8		1	6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	20.0	20.0			13.0		52.0	52.0			45.8	
Effective Green, g (s)	20.0	20.0			13.0		52.0	52.0			45.8	
Actuated g/C Ratio	0.25	0.25			0.16		0.65	0.65			0.57	
Clearance Time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	281	818			479		432	2272			2500	
v/s Ratio Prot	c0.03	0.06					0.01	c0.17				
v/s Ratio Perm	c0.14				0.05		0.14				c0.17	
v/c Ratio	0.69	0.26			0.34		0.24	0.26			0.29	
Uniform Delay, d1	27.0	24.1			29.7		5.3	5.9			8.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	7.1	0.2			0.4		0.3	0.3			0.3	
Delay (s)	34.1	24.2			30.1		5.6	6.2			9.1	
Level of Service	C	C			C		A	A			A	
Approach Delay (s)		28.1			30.1			6.1			9.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	117.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SWR2
Lane Configurations	
Volume (vph)	57
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.95
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	1526
Flt Permitted	1.00
Satd. Flow (perm)	1526
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	57
RTOR Reduction (vph)	24
Lane Group Flow (vph)	33
Confl. Peds. (#/hr)	48
Confl. Bikes (#/hr)	6
Turn Type	custom
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	45.8
Effective Green, g (s)	45.8
Actuated g/C Ratio	0.57
Clearance Time (s)	5.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	874
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.04
Uniform Delay, d1	7.5
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	7.5
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
3: W MacArthur Blvd. & Telegraph Ave.

5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	160	61	49	264	157	92	453	58	103	422	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.98	1.00		0.98	1.00	
Frt		0.97			0.95		1.00	0.98		1.00	0.98	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		4797			4702		1738	3457		1737	3419	
Flt Permitted		0.72			0.85		0.47	1.00		0.46	1.00	
Satd. Flow (perm)		3523			4035		852	3457		848	3419	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	107	160	61	49	264	157	92	453	58	103	422	84
RTOR Reduction (vph)	0	49	0	0	127	0	0	8	0	0	13	0
Lane Group Flow (vph)	0	279	0	0	343	0	92	503	0	103	493	0
Confl. Peds. (#/hr)	47		21	21		47	40		41	41		40
Confl. Bikes (#/hr)			1			3			27			29
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		14.4			14.4		50.1	50.1		50.1	50.1	
Effective Green, g (s)		14.4			14.4		50.1	50.1		50.1	50.1	
Actuated g/C Ratio		0.19			0.19		0.67	0.67		0.67	0.67	
Clearance Time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		676			775		569	2309		566	2284	
v/s Ratio Prot								c0.15			0.14	
v/s Ratio Perm		0.08			c0.09		0.11			0.12		
v/c Ratio		0.41			0.44		0.16	0.22		0.18	0.22	
Uniform Delay, d1		26.6			26.8		4.6	4.8		4.7	4.8	
Progression Factor		1.00			1.00		0.76	0.80		0.57	0.54	
Incremental Delay, d2		0.1			0.1		0.6	0.2		0.7	0.2	
Delay (s)		26.7			26.9		4.1	4.1		3.3	2.8	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		26.7			26.9			4.1			2.9	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: W MacArthur Blvd. & Broadway

5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	277	42	72	343	302	82	355	44	271	415	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.89	1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1559	1770	3539	1412	1770	3471		1770	3539	1489
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1559	1770	3539	1412	1770	3471		1770	3539	1489
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	74	277	42	72	343	302	82	355	44	271	415	68
RTOR Reduction (vph)	0	0	28	0	0	201	0	10	0	0	0	45
Lane Group Flow (vph)	74	277	14	72	343	101	82	389	0	271	415	23
Confl. Peds. (#/hr)	72		2	2		72	42		2	2		42
Confl. Bikes (#/hr)			1			8			11	11		
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	7.5	33.6	33.6	7.5	33.6	33.6	7.1	23.0		17.9	33.8	33.8
Effective Green, g (s)	7.5	33.6	33.6	7.5	33.6	33.6	7.1	23.0		17.9	33.8	33.8
Actuated g/C Ratio	0.08	0.34	0.34	0.08	0.34	0.34	0.07	0.23		0.18	0.34	0.34
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	133	1189	524	133	1189	474	126	798		317	1196	503
v/s Ratio Prot	c0.04	0.08		0.04	c0.10		0.05	c0.11		c0.15	0.12	
v/s Ratio Perm			0.01			0.07						0.02
v/c Ratio	0.56	0.23	0.03	0.54	0.29	0.21	0.65	0.49		0.85	0.35	0.05
Uniform Delay, d1	44.6	23.9	22.2	44.6	24.4	23.8	45.2	33.4		39.8	24.8	22.3
Progression Factor	1.00	1.00	1.00	1.03	1.36	4.22	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.0	0.5	0.1	4.3	0.6	1.0	11.4	0.5		19.6	0.2	0.0
Delay (s)	49.6	24.4	22.3	50.1	33.9	101.1	56.7	33.9		59.4	25.0	22.3
Level of Service	D	C	C	D	C	F	E	C		E	C	C
Approach Delay (s)		28.9			63.8			37.7			37.1	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM Average Control Delay	44.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	575	25	68	521	208	39	146	165	199	83	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.91			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.96			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3514		1770	4722			1843	1340	1770	1716	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3514		1770	4722			1843	1340	1770	1716	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	575	25	68	521	208	39	146	165	199	83	78
RTOR Reduction (vph)	0	2	0	0	52	0	0	0	140	0	38	0
Lane Group Flow (vph)	73	598	0	68	677	0	0	185	25	199	123	0
Confl. Peds. (#/hr)	33					33			67	67		
Confl. Bikes (#/hr)			2						1			1
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	6.5	45.4		5.9	44.8			15.4	15.4	16.3	16.3	
Effective Green, g (s)	6.5	45.4		5.9	44.8			15.4	15.4	16.3	16.3	
Actuated g/C Ratio	0.06	0.45		0.06	0.45			0.15	0.15	0.16	0.16	
Clearance Time (s)	4.5	4.5		4.5	4.5			4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	115	1595		104	2115			284	206	289	280	
v/s Ratio Prot	c0.04	c0.17		0.04	0.14			c0.10		c0.11	0.07	
v/s Ratio Perm									0.02			
v/c Ratio	0.63	0.37		0.65	0.32			0.65	0.12	0.69	0.44	
Uniform Delay, d1	45.6	18.0		46.1	17.8			39.8	36.5	39.5	37.7	
Progression Factor	1.21	1.11		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.5	0.6		10.7	0.4			4.0	0.1	5.4	0.4	
Delay (s)	62.8	20.5		56.8	18.2			43.8	36.6	44.8	38.1	
Level of Service	E	C		E	B			D	D	D	D	
Approach Delay (s)		25.1			21.5			40.4			41.8	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	29.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	146	17	440	214	66	506
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		8.5	8.5	8.5	8.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00		1.00	0.95	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	0.99	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3388		3539	1499	1759	3539
Flt Permitted	0.96		1.00	1.00	0.50	1.00
Satd. Flow (perm)	3388		3539	1499	920	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	146	17	440	214	66	506
RTOR Reduction (vph)	12	0	0	175	0	0
Lane Group Flow (vph)	151	0	440	39	66	506
Confl. Peds. (#/hr)		6		8	8	
Confl. Bikes (#/hr)		8		26		
Turn Type				custom	Perm	
Protected Phases	8		2 10			10
Permitted Phases				2	10	
Actuated Green, G (s)	16.5		45.0	13.7	22.8	22.8
Effective Green, g (s)	16.5		45.0	13.7	22.8	22.8
Actuated g/C Ratio	0.22		0.60	0.18	0.30	0.30
Clearance Time (s)	5.0			8.5	8.5	8.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	745		2123	274	280	1076
v/s Ratio Prot	c0.04		c0.12			c0.14
v/s Ratio Perm				0.03	0.07	
v/c Ratio	0.20		0.21	0.14	0.24	0.47
Uniform Delay, d1	23.9		6.9	25.7	19.6	21.2
Progression Factor	1.00		0.04	3.45	1.00	1.00
Incremental Delay, d2	0.0		0.2	0.9	2.0	1.5
Delay (s)	23.9		0.5	89.6	21.5	22.7
Level of Service	C		A	F	C	C
Approach Delay (s)	23.9		29.7			22.5
Approach LOS	C		C			C

Intersection Summary			
HCM Average Control Delay	26.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	10	114	26	8	17	119	547	20	31	569	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.99	1.00	
Frt		0.93			0.95		1.00	0.99		1.00	0.97	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1673			1716		1763	3514		1750	3427	
Flt Permitted		0.84			0.83		0.36	1.00		0.42	1.00	
Satd. Flow (perm)		1434			1461		669	3514		779	3427	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	109	10	114	26	8	17	119	547	20	31	569	116
RTOR Reduction (vph)	0	46	0	0	12	0	0	4	0	0	23	0
Lane Group Flow (vph)	0	187	0	0	39	0	119	563	0	31	662	0
Confl. Peds. (#/hr)	10		13	13		10	12		28	28		12
Confl. Bikes (#/hr)									11			12
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		42.0	42.0		42.0	42.0	
Effective Green, g (s)		24.0			24.0		42.0	42.0		42.0	42.0	
Actuated g/C Ratio		0.32			0.32		0.56	0.56		0.56	0.56	
Clearance Time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		459			468		375	1968		436	1919	
v/s Ratio Prot								0.16			c0.19	
v/s Ratio Perm		c0.13			0.03		0.18			0.04		
v/c Ratio		0.41			0.08		0.32	0.29		0.07	0.35	
Uniform Delay, d1		19.9			17.8		8.8	8.6		7.6	9.0	
Progression Factor		1.00			1.00		0.37	0.34		1.47	1.17	
Incremental Delay, d2		2.7			0.4		2.2	0.4		0.3	0.5	
Delay (s)		22.6			18.2		5.4	3.3		11.4	11.0	
Level of Service		C			B		A	A		B	B	
Approach Delay (s)		22.6			18.2			3.7			11.0	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	64	36	62	59	46	47	545	52	67	538	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		0.99	1.00		0.96	1.00	
Frt		0.96			0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1741			1721		1755	3455		1706	3515	
Flt Permitted		0.93			0.85		0.43	1.00		0.40	1.00	
Satd. Flow (perm)		1640			1495		788	3455		725	3515	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	23	64	36	62	59	46	47	545	52	67	538	18
RTOR Reduction (vph)	0	20	0	0	18	0	0	10	0	0	3	0
Lane Group Flow (vph)	0	103	0	0	149	0	47	587	0	67	553	0
Confl. Peds. (#/hr)	32		35	35		32	20		93	93		20
Confl. Bikes (#/hr)			4			8			33			33
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		41.0	41.0		41.0	41.0	
Effective Green, g (s)		24.0			24.0		41.0	41.0		41.0	41.0	
Actuated g/C Ratio		0.32			0.32		0.55	0.55		0.55	0.55	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		525			478		431	1889		396	1922	
v/s Ratio Prot								c0.17			0.16	
v/s Ratio Perm		0.06			c0.10		0.06			0.09		
v/c Ratio		0.20			0.31		0.11	0.31		0.17	0.29	
Uniform Delay, d1		18.5			19.3		8.2	9.3		8.5	9.1	
Progression Factor		1.00			1.00		1.04	1.19		0.81	0.94	
Incremental Delay, d2		0.8			1.7		0.5	0.4		0.9	0.4	
Delay (s)		19.3			20.9		9.0	11.5		7.8	8.9	
Level of Service		B			C		A	B		A	A	
Approach Delay (s)		19.3			20.9			11.3			8.8	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM Average Control Delay	12.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	124	174	95	30	252	84	118	398	29	76	390	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.98	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3325		1770	3376		1741	3491		1740	3321	
Flt Permitted	0.95	1.00		0.95	1.00		0.40	1.00		0.48	1.00	
Satd. Flow (perm)	1770	3325		1770	3376		740	3491		887	3321	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	124	174	95	30	252	84	118	398	29	76	390	166
RTOR Reduction (vph)	0	66	0	0	47	0	0	6	0	0	53	0
Lane Group Flow (vph)	124	203	0	30	289	0	118	421	0	76	503	0
Confl. Peds. (#/hr)	13		7	7		13	45		37	37		45
Confl. Bikes (#/hr)			5			12			22			24
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.7	23.1		2.8	18.2		35.6	35.6		35.6	35.6	
Effective Green, g (s)	8.2	22.6		3.3	17.7		37.1	37.1		37.1	37.1	
Actuated g/C Ratio	0.11	0.30		0.04	0.24		0.49	0.49		0.49	0.49	
Clearance Time (s)	4.5	3.5		4.5	3.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	194	1002		78	797		366	1727		439	1643	
v/s Ratio Prot	c0.07	0.06		0.02	c0.09			0.12			0.15	
v/s Ratio Perm							c0.16			0.09		
v/c Ratio	0.64	0.20		0.38	0.36		0.32	0.24		0.17	0.31	
Uniform Delay, d1	32.0	19.5		34.9	23.9		11.4	10.9		10.5	11.3	
Progression Factor	1.00	1.00		1.01	1.02		1.01	0.98		0.98	1.00	
Incremental Delay, d2	5.0	0.0		1.1	0.1		2.3	0.3		0.9	0.5	
Delay (s)	37.0	19.5		36.3	24.6		13.7	11.0		11.1	11.7	
Level of Service	D	B		D	C		B	B		B	B	
Approach Delay (s)		25.0			25.6			11.6			11.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	149	44	22	193	208	60	381	16	132	439	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99			1.00	0.95	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.98	1.00			1.00	1.00	0.99	1.00		0.99	1.00	
Frt	1.00	0.97			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1740	3399			3520	1504	1752	3511		1746	3414	
Flt Permitted	0.62	1.00			0.92	1.00	0.41	1.00		0.50	1.00	
Satd. Flow (perm)	1131	3399			3251	1504	750	3511		915	3414	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	98	149	44	22	193	208	60	381	16	132	439	96
RTOR Reduction (vph)	0	25	0	0	0	118	0	4	0	0	25	0
Lane Group Flow (vph)	98	168	0	0	215	90	60	393	0	132	510	0
Confl. Peds. (#/hr)	30		8	8		30	33		35	35		33
Confl. Bikes (#/hr)			13			32			25			32
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		3			4			1			1	
Permitted Phases	3			4		4	1			1		
Actuated Green, G (s)	31.0	31.0			31.0	31.0	33.0	33.0		33.0	33.0	
Effective Green, g (s)	32.5	32.5			32.5	32.5	34.5	34.5		34.5	34.5	
Actuated g/C Ratio	0.43	0.43			0.43	0.43	0.46	0.46		0.46	0.46	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Grp Cap (vph)	490	1473			1409	652	345	1615		421	1570	
v/s Ratio Prot		0.05						0.11			c0.15	
v/s Ratio Perm	c0.09				0.07	0.06	0.08			0.14		
v/c Ratio	0.20	0.11			0.15	0.14	0.17	0.24		0.31	0.32	
Uniform Delay, d1	13.2	12.7			12.9	12.8	11.9	12.3		12.8	12.9	
Progression Factor	1.24	1.22			1.00	1.00	2.00	2.03		1.25	1.30	
Incremental Delay, d2	0.9	0.2			0.2	0.4	1.1	0.4		1.9	0.5	
Delay (s)	17.2	15.6			13.1	13.3	24.8	25.4		17.8	17.3	
Level of Service	B	B			B	B	C	C		B	B	
Approach Delay (s)		16.1			13.2			25.3			17.4	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	69	224	41	15	50	14	198	198	12	137	301	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00			1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.59			1.00	1.00	0.76		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85			1.00	1.00	0.85		1.00	0.97	
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	929			1770	1863	1208		3433	3388	
Flt Permitted	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	929			1770	1863	1208		3433	3388	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	69	224	41	15	50	14	198	198	12	137	301	65
RTOR Reduction (vph)	0	0	8	0	0	0	0	159	0	0	10	0
Lane Group Flow (vph)	69	224	48	0	0	64	198	39	0	149	356	0
Confl. Peds. (#/hr)			38	38				92				45
Confl. Bikes (#/hr)			22	22				38				7
Turn Type	Prot		Perm		Prot	Prot		Perm	Prot	Prot		
Protected Phases	10	4			3	3	8		5	5	2	
Permitted Phases			4					8				
Actuated Green, G (s)	23.8	19.0	19.0			7.9	31.9	31.9		12.1	67.0	
Effective Green, g (s)	23.8	19.0	19.0			7.9	31.9	31.9		12.1	67.0	
Actuated g/C Ratio	0.15	0.12	0.12			0.05	0.20	0.20		0.08	0.42	
Clearance Time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0			3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	263	420	110			87	371	241		260	1419	
v/s Ratio Prot	c0.04	0.06				c0.04	c0.11			0.04	c0.10	
v/s Ratio Perm			0.05					0.03				
v/c Ratio	0.26	0.53	0.44			0.74	0.53	0.16		0.57	0.25	
Uniform Delay, d1	60.3	66.3	65.5			75.0	57.4	53.0		71.5	30.2	
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.3	2.8			27.3	1.5	0.3		3.0	0.4	
Delay (s)	60.9	67.6	68.3			102.3	58.9	53.3		74.5	30.6	
Level of Service	E	E	E			F	E	D		E	C	
Approach Delay (s)		66.4					62.5				43.3	
Approach LOS		E					E				D	

Intersection Summary			
HCM Average Control Delay	53.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	152	263	21	63
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	0.96		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.96		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3274		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3274		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	152	263	21	63
RTOR Reduction (vph)	0	10	0	0
Lane Group Flow (vph)	152	337	0	0
Confl. Peds. (#/hr)			46	46
Confl. Bikes (#/hr)			6	6
Turn Type	Prot			
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	17.3	72.2		
Effective Green, g (s)	17.3	72.2		
Actuated g/C Ratio	0.11	0.45		
Clearance Time (s)	5.0	5.0		
Vehicle Extension (s)	3.0	3.0		
Lane Grp Cap (vph)	191	1477		
v/s Ratio Prot	c0.09	0.10		
v/s Ratio Perm				
v/c Ratio	0.80	0.23		
Uniform Delay, d1	69.6	26.9		
Progression Factor	1.00	1.00		
Incremental Delay, d2	20.1	0.4		
Delay (s)	89.7	27.2		
Level of Service	F	C		
Approach Delay (s)		46.2		
Approach LOS		D		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	340	57	72	265	42	82	336	110	57	311	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00	0.93	1.00	0.98	
Flpb, ped/bikes	0.97	1.00			0.99		0.96	1.00	1.00	0.96	1.00	
Frt	1.00	0.98			0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1715	3414			3391		1706	3539	1465	1702	3381	
Flt Permitted	0.46	1.00			0.80		0.52	1.00	1.00	0.55	1.00	
Satd. Flow (perm)	831	3414			2731		939	3539	1465	984	3381	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	85	340	57	72	265	42	82	336	110	57	311	76
RTOR Reduction (vph)	0	25	0	0	17	0	0	0	42	0	20	0
Lane Group Flow (vph)	85	372	0	0	362	0	82	336	68	57	367	0
Confl. Peds. (#/hr)	66		96	96		66	74		73	73		74
Confl. Bikes (#/hr)			12			12			10			23
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	19.8	19.8			19.8		44.2	44.2	44.2	44.2	44.2	
Effective Green, g (s)	19.8	19.8			19.8		44.2	44.2	44.2	44.2	44.2	
Actuated g/C Ratio	0.28	0.28			0.28		0.61	0.61	0.61	0.61	0.61	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	229	939			751		576	2173	899	604	2076	
v/s Ratio Prot		0.11						0.09			c0.11	
v/s Ratio Perm	0.10				c0.13		0.09		0.05	0.06		
v/c Ratio	0.37	0.40			0.48		0.14	0.15	0.08	0.09	0.18	
Uniform Delay, d1	21.1	21.2			21.8		5.9	5.9	5.6	5.7	6.0	
Progression Factor	1.00	1.00			0.98		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1			0.2		0.5	0.2	0.2	0.3	0.2	
Delay (s)	21.4	21.3			21.5		6.4	6.1	5.8	6.0	6.2	
Level of Service	C	C			C		A	A	A	A	A	
Approach Delay (s)		21.4			21.5			6.1			6.2	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	34	65	61	182	168	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	34	65	61	182	168	32
Pedestrians		50	50		50	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		4	4		4	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			125			
pX, platoon unblocked	0.98				0.98	0.98
vC, conflicting volume	293				385	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	264				358	222
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				70	96
cM capacity (veh/h)	1217				558	733

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	99	243	200
Volume Left	34	0	168
Volume Right	0	182	32
cSH	1217	1700	580
Volume to Capacity	0.03	0.14	0.34
Queue Length 95th (ft)	2	0	38
Control Delay (s)	2.9	0.0	14.4
Lane LOS	A		B
Approach Delay (s)	2.9	0.0	14.4
Approach LOS			B

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	0	19	0	0	16	30	601	6	4	584	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	4.0			4.0	8.5	8.5			8.5	
Lane Util. Factor		1.00	1.00			1.00	1.00	0.95			0.95	
Frpb, ped/bikes		1.00	0.98			0.99	1.00	1.00			1.00	
Flpb, ped/bikes		1.00	1.00			1.00	0.98	1.00			1.00	
Frt		1.00	0.85			0.86	1.00	1.00			0.99	
Flt Protected		0.95	1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1767	1552			1590	1740	3531			3492	
Flt Permitted		0.95	1.00			1.00	0.42	1.00			0.95	
Satd. Flow (perm)		1767	1552			1590	761	3531			3323	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	0	19	0	0	16	30	601	6	4	584	36
RTOR Reduction (vph)	0	0	14	0	0	12	0	1	0	0	6	0
Lane Group Flow (vph)	0	30	5	0	0	4	30	606	0	0	618	0
Confl. Peds. (#/hr)	1		6	6		1	17		18	18		17
Confl. Bikes (#/hr)			1						31			32
Turn Type	custom		custom			custom	Perm			Perm		
Protected Phases		2						10			7 10	
Permitted Phases	1		1			3	10			7 10		
Actuated Green, G (s)		13.7	18.2			17.5	22.8	22.8			44.3	
Effective Green, g (s)		13.7	18.2			17.5	22.8	22.8			44.3	
Actuated g/C Ratio		0.18	0.24			0.23	0.30	0.30			0.59	
Clearance Time (s)		8.5	4.0			4.0	8.5	8.5				
Vehicle Extension (s)		2.0	2.0			2.0	2.0	2.0				
Lane Grp Cap (vph)		323	377			371	231	1073			1963	
v/s Ratio Prot								c0.17				
v/s Ratio Perm		0.02	0.00			0.00	0.04				c0.19	
v/c Ratio		0.09	0.01			0.01	0.13	0.57			0.31	
Uniform Delay, d1		25.5	21.6			22.1	18.9	21.9			7.7	
Progression Factor		1.00	1.00			1.00	0.56	0.52			0.13	
Incremental Delay, d2		0.6	0.0			0.0	1.1	2.1			0.4	
Delay (s)		26.1	21.6			22.1	11.7	13.6			1.4	
Level of Service		C	C			C	B	B			A	
Approach Delay (s)		24.3			22.1			13.5			1.4	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix B5

LOS Calculation Worksheets
2035 No Project Conditions

FEHR PEERS

HCM Signalized Intersection Capacity Analysis

1: 51st St. & Broadway

5/22/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	300	850	95	222	400	460	116	1311	253	80	510	550
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			0.91			0.86	0.86
Frpb, ped/bikes	1.00	1.00		1.00	0.98			0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.92			0.98			1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.95	0.98
Satd. Flow (prot)	1770	3475		1770	3180			4893			1522	4723
Flt Permitted	0.95	1.00		0.95	1.00			1.00			0.95	0.98
Satd. Flow (perm)	1770	3475		1770	3180			4893			1522	4723
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	300	850	95	222	400	460	116	1311	253	80	510	550
RTOR Reduction (vph)	0	7	0	0	184	0	0	23	0	0	0	0
Lane Group Flow (vph)	300	938	0	222	676	0	0	1658	0	0	294	846
Confl. Peds. (#/hr)			11			24			44			
Confl. Bikes (#/hr)			9			5			8			
Turn Type	Prot			Prot			Split			Split	Split	
Protected Phases	1	6		5	2		8	8		4	4	4
Permitted Phases												
Actuated Green, G (s)	15.0	28.5		15.0	28.5			27.5			23.0	23.0
Effective Green, g (s)	15.0	28.5		15.0	28.5			27.5			23.0	23.0
Actuated g/C Ratio	0.14	0.26		0.14	0.26			0.25			0.21	0.21
Clearance Time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	241	900		241	824			1223			318	988
v/s Ratio Prot	c0.17	c0.27		0.13	0.21			c0.34			c0.19	0.18
v/s Ratio Perm												
v/c Ratio	1.24	1.04		0.92	0.82			1.36			0.92	0.86
Uniform Delay, d1	47.5	40.8		46.9	38.3			41.2			42.6	41.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	140.0	41.4		37.2	6.6			165.3			34.4	9.5
Delay (s)	187.5	82.2		84.1	44.9			206.6			77.1	51.4
Level of Service	F	F		F	D			F			E	D
Approach Delay (s)		107.6			53.0			206.6				55.7
Approach LOS		F			D			F				E

Intersection Summary			
HCM Average Control Delay	115.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	110.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	130
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1530
Flt Permitted	1.00
Satd. Flow (perm)	1530
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	130
RTOR Reduction (vph)	103
Lane Group Flow (vph)	27
Confl. Peds. (#/hr)	9
Confl. Bikes (#/hr)	8
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	23.0
Effective Green, g (s)	23.0
Actuated g/C Ratio	0.21
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	320
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.08
Uniform Delay, d1	35.0
Progression Factor	1.00
Incremental Delay, d2	0.5
Delay (s)	35.5
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL2	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	450	390	218	50	300	70	228	1360	80	30	627	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95			0.95	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00			0.98	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	
Frt	1.00	0.95			0.97		1.00	0.99			0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3300			3402		1764	3494			3357	
Flt Permitted	0.30	1.00			0.83		0.24	1.00			0.86	
Satd. Flow (perm)	568	3300			2853		453	3494			2878	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	450	390	218	50	300	70	228	1360	80	30	627	190
RTOR Reduction (vph)	0	119	0	0	0	0	0	4	0	0	26	0
Lane Group Flow (vph)	450	489	0	0	420	0	228	1436	0	0	821	0
Confl. Peds. (#/hr)			26	26		33	69		78	78		69
Confl. Bikes (#/hr)			11			5			21			15
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	7	4			8		1	6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	25.6	25.6			18.6		46.4	46.4			39.4	
Effective Green, g (s)	25.6	25.6			18.6		46.4	46.4			39.4	
Actuated g/C Ratio	0.32	0.32			0.23		0.58	0.58			0.49	
Clearance Time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	242	1056			663		328	2027			1417	
v/s Ratio Prot	c0.09	0.15					0.03	c0.41				
v/s Ratio Perm	c0.50				0.15		0.37				0.29	
v/c Ratio	1.86	0.46			0.63		0.70	0.71			0.58	
Uniform Delay, d1	27.3	21.7			27.6		11.0	12.0			14.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	402.2	0.3			2.0		6.3	2.1			1.7	
Delay (s)	429.5	22.0			29.6		17.3	14.1			16.1	
Level of Service	F	C			C		B	B			B	
Approach Delay (s)		195.3			29.6			14.5			16.1	
Approach LOS		F			C			B			B	

Intersection Summary			
HCM Average Control Delay	64.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	126.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SWR2
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	1611
Flt Permitted	1.00
Satd. Flow (perm)	1611
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	30
RTOR Reduction (vph)	15
Lane Group Flow (vph)	15
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Turn Type	custom
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	39.4
Effective Green, g (s)	39.4
Actuated g/C Ratio	0.49
Clearance Time (s)	5.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	793
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.02
Uniform Delay, d1	10.4
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	10.4
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	738	348	200	818	340	318	1189	80	290	798	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.97			0.97		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		0.99	1.00	
Frt		0.96			0.96		1.00	0.99		1.00	0.97	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		4699			4723		1751	3490		1760	3385	
Flt Permitted		0.65			0.65		0.18	1.00		0.10	1.00	
Satd. Flow (perm)		3085			3085		324	3490		190	3385	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	738	348	200	818	340	318	1189	80	290	798	200
RTOR Reduction (vph)	0	43	0	0	2	0	0	3	0	0	16	0
Lane Group Flow (vph)	0	1243	0	0	1356	0	318	1266	0	290	982	0
Confl. Peds. (#/hr)	83		81	81		83	56		57	57		56
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		38.3			38.3		39.0	39.0		39.0	39.0	
Effective Green, g (s)		38.3			38.3		39.0	39.0		39.0	39.0	
Actuated g/C Ratio		0.44			0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		1346			1346		144	1550		84	1504	
v/s Ratio Prot								0.36			0.29	
v/s Ratio Perm		0.40			c0.44		0.98			c1.53		
v/c Ratio		1.44dl			1.80dl		2.21	0.82		3.45	0.65	
Uniform Delay, d1		23.4			24.8		24.4	21.3		24.4	19.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.5			26.3		565.7	3.3		1133.0	0.8	
Delay (s)		33.9			51.1		590.1	24.6		1157.4	19.9	
Level of Service		C			D		F	C		F	B	
Approach Delay (s)		33.9			51.1			137.9			276.0	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM Average Control Delay	124.5	HCM Level of Service	F
HCM Volume to Capacity ratio	2.23		
Actuated Cycle Length (s)	87.8	Sum of lost time (s)	10.5
Intersection Capacity Utilization	125.6%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	1000	138	210	940	350	338	1168	210	320	675	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.90	1.00	1.00	0.89	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1477	1770	3539	1421	1770	3539	1417	1770	3539	1525
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1477	1770	3539	1421	1770	3539	1417	1770	3539	1525
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	1000	138	210	940	350	338	1168	210	320	675	80
RTOR Reduction (vph)	0	0	86	0	0	234	0	0	113	0	0	42
Lane Group Flow (vph)	200	1000	52	210	940	116	338	1168	97	320	675	38
Confl. Peds. (#/hr)			44			72			87			23
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.0	33.0	33.0	13.0	34.0	34.0	23.0	35.0	35.0	21.0	33.0	33.0
Effective Green, g (s)	12.0	33.0	33.0	13.0	34.0	34.0	23.0	35.0	35.0	21.0	33.0	33.0
Actuated g/C Ratio	0.10	0.28	0.28	0.11	0.28	0.28	0.19	0.29	0.29	0.18	0.28	0.28
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	973	406	192	1003	403	339	1032	413	310	973	419
v/s Ratio Prot	0.11	c0.28		c0.12	0.27		c0.19	c0.33		0.18	0.19	
v/s Ratio Perm			0.04			0.08			0.07			0.02
v/c Ratio	1.13	1.03	0.13	1.09	0.94	0.29	1.00	1.13	0.24	1.03	0.69	0.09
Uniform Delay, d1	54.0	43.5	32.7	53.5	42.0	33.6	48.5	42.5	32.3	49.5	39.0	32.3
Progression Factor	1.00	1.00	1.00	1.37	0.67	0.69	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	106.9	36.2	0.6	82.3	13.1	1.3	47.8	71.7	0.3	59.7	2.2	0.1
Delay (s)	160.9	79.7	33.3	155.8	41.4	24.4	96.2	114.2	32.6	109.2	41.1	32.4
Level of Service	F	E	C	F	D	C	F	F	C	F	D	C
Approach Delay (s)		87.0			53.4			100.7			60.7	
Approach LOS		F			D			F			E	

Intersection Summary			
HCM Average Control Delay	77.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: W MacArthur Blvd. & Piedmont Ave. 5/22/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	1500	120	208	1340	230	130	263	489	240	112	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00	0.92	1.00	0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4942		1770	4903		1770	1863	1450	1770	1609	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4942		1770	4903		1770	1863	1450	1770	1609	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	1500	120	208	1340	230	130	263	489	240	112	120
RTOR Reduction (vph)	0	7	0	0	18	0	0	0	215	0	34	0
Lane Group Flow (vph)	110	1613	0	208	1552	0	130	263	275	240	198	0
Confl. Peds. (#/hr)	30		83	83		30	104		36	36		104
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	9.3	48.2		15.2	54.1		11.3	26.4	26.4	13.2	28.3	
Effective Green, g (s)	9.3	48.2		15.2	54.1		11.3	26.4	26.4	13.2	28.3	
Actuated g/C Ratio	0.08	0.40		0.13	0.45		0.09	0.22	0.22	0.11	0.24	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	137	1985		224	2210		167	410	319	195	379	
v/s Ratio Prot	0.06	c0.33		c0.12	0.32		0.07	0.14		c0.14	0.12	
v/s Ratio Perm									c0.19			
v/c Ratio	0.80	0.81		0.93	0.70		0.78	0.64	0.86	1.23	0.52	
Uniform Delay, d1	54.4	31.9		51.9	26.5		53.1	42.5	45.0	53.4	39.9	
Progression Factor	0.71	0.61		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.3	2.0		39.9	1.9		18.5	2.6	19.8	140.3	0.6	
Delay (s)	54.0	21.4		91.8	28.4		71.6	45.1	64.8	193.7	40.5	
Level of Service	D	C		F	C		E	D	E	F	D	
Approach Delay (s)		23.5			35.8			59.9			118.4	
Approach LOS		C			D			E			F	

Intersection Summary			
HCM Average Control Delay	43.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	410	120	1386	592	150	997
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		8.5	8.5	8.5	8.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frpb, ped/bikes	0.98		1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3303		3539	1560	1770	3539
Flt Permitted	0.96		1.00	1.00	0.13	1.00
Satd. Flow (perm)	3303		3539	1560	234	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	410	120	1386	592	150	997
RTOR Reduction (vph)	33	0	0	139	0	0
Lane Group Flow (vph)	497	0	1386	453	150	997
Confl. Peds. (#/hr)		44		2		
Turn Type				custom	Perm	
Protected Phases	8		2 10			10
Permitted Phases				2	10	
Actuated Green, G (s)	17.5		54.0	13.7	31.8	31.8
Effective Green, g (s)	17.5		54.0	13.7	31.8	31.8
Actuated g/C Ratio	0.21		0.64	0.16	0.37	0.37
Clearance Time (s)	5.0			8.5	8.5	8.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	680		2248	251	88	1324
v/s Ratio Prot	c0.15		0.39			0.28
v/s Ratio Perm				c0.29	c0.64	
v/c Ratio	0.73		0.62	1.80	1.70	0.75
Uniform Delay, d1	31.5		9.3	35.6	26.6	23.2
Progression Factor	1.00		0.14	1.07	1.00	1.00
Incremental Delay, d2	3.5		0.1	363.2	360.6	4.0
Delay (s)	35.0		1.4	401.5	387.2	27.2
Level of Service	D		A	F	F	C
Approach Delay (s)	35.0		121.1			74.3
Approach LOS	D		F			E

Intersection Summary			
HCM Average Control Delay	93.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	10	124	90	20	100	84	1529	80	100	1260	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.97			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Frt		0.94			0.94		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620			1634		1764	3500		1762	3505	
Flt Permitted		0.70			0.76		0.14	1.00		0.08	1.00	
Satd. Flow (perm)		1160			1265		266	3500		153	3505	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	10	124	90	20	100	84	1529	80	100	1260	67
RTOR Reduction (vph)	0	33	0	0	20	0	0	4	0	0	5	0
Lane Group Flow (vph)	0	251	0	0	190	0	84	1605	0	100	1322	0
Confl. Peds. (#/hr)	70		49	49		51	27		65	65		27
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		52.0	52.0		52.0	52.0	
Effective Green, g (s)		24.0			24.0		52.0	52.0		52.0	52.0	
Actuated g/C Ratio		0.28			0.28		0.61	0.61		0.61	0.61	
Clearance Time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		328			357		163	2141		94	2144	
v/s Ratio Prot								0.46			0.38	
v/s Ratio Perm		c0.22			0.15		0.32			c0.65		
v/c Ratio		0.77			0.53		0.52	0.75		1.06	0.62	
Uniform Delay, d1		27.9			25.8		9.4	11.8		16.5	10.3	
Progression Factor		1.00			1.00		0.39	0.33		1.62	1.82	
Incremental Delay, d2		15.6			5.6		6.4	1.4		101.2	1.1	
Delay (s)		43.5			31.3		10.0	5.3		127.9	19.7	
Level of Service		D			C		B	A		F	B	
Approach Delay (s)		43.5			31.3			5.6			27.3	
Approach LOS		D			C			A			C	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	140	90	110	80	93	70	1539	150	164	1240	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.94			0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			0.96		0.98	1.00		1.00	1.00	
Frt		0.96			0.96		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1652			1649		1740	3472		1764	3500	
Flt Permitted		0.84			0.65		0.15	1.00		0.08	1.00	
Satd. Flow (perm)		1398			1100		273	3472		146	3500	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	140	90	110	80	93	70	1539	150	164	1240	50
RTOR Reduction (vph)	0	18	0	0	19	0	0	8	0	0	3	0
Lane Group Flow (vph)	0	282	0	0	264	0	70	1681	0	164	1287	0
Confl. Peds. (#/hr)	40		181	181		40	141		53	53		141
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		51.0	51.0		51.0	51.0	
Effective Green, g (s)		24.0			24.0		51.0	51.0		51.0	51.0	
Actuated g/C Ratio		0.28			0.28		0.60	0.60		0.60	0.60	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		395			311		164	2083		88	2100	
v/s Ratio Prot								0.48			0.37	
v/s Ratio Perm		0.20			c0.24		0.26			c1.13		
v/c Ratio		0.71			0.85		0.43	0.81		1.86	0.61	
Uniform Delay, d1		27.4			28.8		9.1	13.2		17.0	10.8	
Progression Factor		1.00			1.00		1.26	1.27		0.47	0.38	
Incremental Delay, d2		10.5			23.9		4.9	2.2		420.3	1.0	
Delay (s)		37.9			52.7		16.4	18.9		428.2	5.2	
Level of Service		D			D		B	B		F	A	
Approach Delay (s)		37.9			52.7			18.8			52.9	
Approach LOS		D			D			B			D	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.54		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: 27th St. & Telegraph Ave.

5/22/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	636	160	90	682	400	230	796	170	440	857	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.94		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3394		1770	3298		1767	3423		1767	3337	
Flt Permitted	0.95	1.00		0.95	1.00		0.10	1.00		0.19	1.00	
Satd. Flow (perm)	1770	3394		1770	3298		189	3423		355	3337	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	191	636	160	90	682	400	230	796	170	440	857	391
RTOR Reduction (vph)	0	24	0	0	88	0	0	22	0	0	63	0
Lane Group Flow (vph)	191	772	0	90	994	0	230	944	0	440	1185	0
Confl. Peds. (#/hr)			30			18	14		9	9		14
Confl. Bikes (#/hr)			14			5			38			20
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	10.3	26.4		7.3	23.4		37.8	37.8		37.8	37.8	
Effective Green, g (s)	10.8	25.9		7.8	22.9		39.3	39.3		39.3	39.3	
Actuated g/C Ratio	0.13	0.30		0.09	0.27		0.46	0.46		0.46	0.46	
Clearance Time (s)	4.5	3.5		4.5	3.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	225	1034		162	889		87	1583		164	1543	
v/s Ratio Prot	c0.11	c0.23		0.05	c0.30			0.28			0.36	
v/s Ratio Perm							1.21			c1.24		
v/c Ratio	0.85	0.75		0.56	1.12		2.64	0.60		2.68	0.77	
Uniform Delay, d1	36.3	26.6		36.9	31.1		22.9	17.0		22.9	19.0	
Progression Factor	1.00	1.00		0.89	1.37		0.98	0.91		0.86	0.89	
Incremental Delay, d2	23.7	2.6		0.9	59.9		762.4	1.2		773.2	3.5	
Delay (s)	60.0	29.2		33.9	102.5		784.8	16.6		792.8	20.4	
Level of Service	E	C		C	F		F	B		F	C	
Approach Delay (s)		35.2			97.2			164.3			221.7	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM Average Control Delay	142.7	HCM Level of Service	F
HCM Volume to Capacity ratio	2.02		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	108.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: 27th St. & Broadway

5/22/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	196	970	110	50	780	461	220	1092	90	383	844	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00	0.91	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00			1.00	1.00	0.99	1.00		0.99	1.00	
Frt	1.00	0.98			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1748	3471			3528	1434	1744	3470		1751	3391	
Flt Permitted	0.20	1.00			0.67	1.00	0.20	1.00		0.15	1.00	
Satd. Flow (perm)	364	3471			2380	1434	373	3470		277	3391	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	196	970	110	50	780	461	220	1092	90	383	844	172
RTOR Reduction (vph)	0	10	0	0	0	27	0	7	0	0	20	0
Lane Group Flow (vph)	196	1070	0	0	830	434	220	1175	0	383	996	0
Confl. Peds. (#/hr)	57		23	23		57	95		93	93		95
Confl. Bikes (#/hr)			13			63			70			46
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		3			4			1			1	
Permitted Phases	3			4		4	1			1		
Actuated Green, G (s)	30.0	30.0			30.0	30.0	44.0	44.0		44.0	44.0	
Effective Green, g (s)	31.5	31.5			31.5	31.5	45.5	45.5		45.5	45.5	
Actuated g/C Ratio	0.37	0.37			0.37	0.37	0.54	0.54		0.54	0.54	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Grp Cap (vph)	135	1286			882	531	200	1857		148	1815	
v/s Ratio Prot		0.31						0.34			0.29	
v/s Ratio Perm	c0.54				0.35	0.30	0.59			c1.38		
v/c Ratio	1.45	0.83			0.94	0.82	1.10	0.63		2.59	0.55	
Uniform Delay, d1	26.8	24.3			25.9	24.2	19.8	13.9		19.8	13.0	
Progression Factor	1.03	1.06			1.00	1.00	1.88	2.12		1.12	1.04	
Incremental Delay, d2	207.1	0.6			19.0	13.1	83.9	1.2		729.4	0.9	
Delay (s)	234.6	26.4			44.8	37.2	121.2	30.6		751.5	14.4	
Level of Service	F	C			D	D	F	C		F	B	
Approach Delay (s)		58.4			42.1			44.8			216.2	
Approach LOS		E			D			D			F	

Intersection Summary			
HCM Average Control Delay	92.1	HCM Level of Service	F
HCM Volume to Capacity ratio	2.12		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	140.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	440	601	422	130	90	30	280	180	30	781	1570	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00			1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.59			1.00	1.00	0.84		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85			1.00	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	939			1770	1863	1325		3433	3461	
Flt Permitted	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	939			1770	1863	1325		3433	3461	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	440	601	422	130	90	30	280	180	30	781	1570	110
RTOR Reduction (vph)	0	0	7	0	0	0	0	135	0	0	3	0
Lane Group Flow (vph)	440	601	545	0	0	120	280	45	0	811	1677	0
Confl. Peds. (#/hr)			95					70				101
Confl. Bikes (#/hr)			4	4				2				4
Turn Type	Prot		Perm		Prot	Prot		Perm	Prot	Prot		
Protected Phases	10	4			3	3	8		5	5	2	
Permitted Phases			4					8				
Actuated Green, G (s)	28.0	20.0	20.0			10.0	35.0	35.0		15.0	58.0	
Effective Green, g (s)	28.0	20.0	20.0			10.0	35.0	35.0		15.0	58.0	
Actuated g/C Ratio	0.18	0.12	0.12			0.06	0.22	0.22		0.09	0.36	
Clearance Time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	2.0	2.0			2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	310	442	117			111	408	290		322	1255	
v/s Ratio Prot	c0.25	0.17				c0.07	0.15			c0.24	c0.48	
v/s Ratio Perm			c0.58					0.03				
v/c Ratio	1.42	1.36	4.66			1.08	0.69	0.15		2.52	1.34	
Uniform Delay, d1	66.0	70.0	70.0			75.0	57.5	50.5		72.5	51.0	
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	206.7	176.0	1665.5			108.9	3.8	0.1		692.5	156.7	
Delay (s)	272.7	246.0	1735.5			183.9	61.2	50.6		765.0	207.7	
Level of Service	F	F	F			F	E	D		F	F	
Approach Delay (s)		769.5					83.3				389.2	
Approach LOS		F					F				F	

Intersection Summary			
HCM Average Control Delay	395.6	HCM Level of Service	F
HCM Volume to Capacity ratio	2.00		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	117.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	200	800	60	130
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	0.92		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.97		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3169		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3169		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	800	60	130
RTOR Reduction (vph)	0	7	0	0
Lane Group Flow (vph)	200	983	0	0
Confl. Peds. (#/hr)			232	232
Confl. Bikes (#/hr)			23	23
Turn Type	Prot			
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	19.0	62.0		
Effective Green, g (s)	19.0	62.0		
Actuated g/C Ratio	0.12	0.39		
Clearance Time (s)	5.0	5.0		
Vehicle Extension (s)	2.0	2.0		
Lane Grp Cap (vph)	210	1228		
v/s Ratio Prot	0.11	c0.31		
v/s Ratio Perm				
v/c Ratio	0.95	0.80		
Uniform Delay, d1	70.1	43.5		
Progression Factor	1.00	1.00		
Incremental Delay, d2	48.1	5.5		
Delay (s)	118.1	49.0		
Level of Service	F	D		
Approach Delay (s)		60.6		
Approach LOS		E		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	174	1180	100	100	810	120	450	1119	280	150	620	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98			1.00		1.00	1.00	0.90	1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.96	1.00	1.00	0.99	1.00	
Frt	1.00	0.99			0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1765	3439			3441		1705	3539	1425	1753	3338	
Flt Permitted	0.15	1.00			0.55		0.28	1.00	1.00	0.15	1.00	
Satd. Flow (perm)	271	3439			1892		504	3539	1425	270	3338	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	174	1180	100	100	810	120	450	1119	280	150	620	154
RTOR Reduction (vph)	0	7	0	0	12	0	0	0	3	0	26	0
Lane Group Flow (vph)	174	1273	0	0	1018	0	450	1119	277	150	748	0
Confl. Peds. (#/hr)	15		228	228		15	148		70	70		148
Confl. Bikes (#/hr)			15			10			51			11
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	36.0	36.0			36.0		41.0	41.0	41.0	41.0	41.0	
Effective Green, g (s)	36.0	36.0			36.0		41.0	41.0	41.0	41.0	41.0	
Actuated g/C Ratio	0.42	0.42			0.42		0.48	0.48	0.48	0.48	0.48	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	115	1457			801		243	1707	687	130	1610	
v/s Ratio Prot		0.37						0.32			0.22	
v/s Ratio Perm	c0.64				0.54		c0.89		0.19	0.55		
v/c Ratio	1.51	0.87			1.27		1.85	0.66	0.40	1.15	0.46	
Uniform Delay, d1	24.5	22.4			24.5		22.0	16.7	14.1	22.0	14.7	
Progression Factor	1.03	1.02			1.73		1.00	1.00	1.00	0.99	0.91	
Incremental Delay, d2	248.4	2.6			130.3		398.8	2.0	1.8	125.8	1.0	
Delay (s)	273.5	25.4			172.8		420.8	18.6	15.9	147.7	14.3	
Level of Service	F	C			F		F	B	B	F	B	
Approach Delay (s)		55.1			172.8			116.1			36.0	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM Average Control Delay	96.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.69		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	129.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			108			
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	330	0	180	0	0	30	140	1619	30	0	1217	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	4.0			4.0	8.5	8.5			8.5	
Lane Util. Factor		1.00	1.00			1.00	1.00	0.95			0.95	
Frpb, ped/bikes		1.00	0.95			0.98	1.00	1.00			0.99	
Flpb, ped/bikes		0.99	1.00			1.00	0.99	1.00			1.00	
Frt		1.00	0.85			0.86	1.00	1.00			0.98	
Flt Protected		0.95	1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1754	1508			1579	1750	3530			3423	
Flt Permitted		0.95	1.00			1.00	0.19	1.00			1.00	
Satd. Flow (perm)		1754	1508			1579	351	3530			3423	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	0	180	0	0	30	140	1619	30	0	1217	190
RTOR Reduction (vph)	0	0	57	0	0	22	0	1	0	0	14	0
Lane Group Flow (vph)	0	330	123	0	0	8	140	1648	0	0	1393	0
Confl. Peds. (#/hr)	6		27	27		6	29					29
Turn Type	custom		custom			custom	Perm					
Protected Phases		2						10			7 10	
Permitted Phases	1		1			3	10					
Actuated Green, G (s)		13.7	18.2			18.5	31.8	31.8			54.3	
Effective Green, g (s)		13.7	18.2			18.5	31.8	31.8			54.3	
Actuated g/C Ratio		0.16	0.21			0.22	0.37	0.37			0.64	
Clearance Time (s)		8.5	4.0			4.0	8.5	8.5				
Vehicle Extension (s)		2.0	2.0			2.0	2.0	2.0				
Lane Grp Cap (vph)		283	323			344	131	1321			2187	
v/s Ratio Prot								c0.47			c0.41	
v/s Ratio Perm		0.19	0.08			0.01	0.40					
v/c Ratio		1.17	0.38			0.02	1.07	1.25			0.64	
Uniform Delay, d1		35.6	28.6			26.1	26.6	26.6			9.3	
Progression Factor		1.00	1.00			1.00	0.66	0.65			0.13	
Incremental Delay, d2		106.2	0.3			0.1	83.1	115.6			0.9	
Delay (s)		141.8	28.8			26.3	100.7	132.9			2.1	
Level of Service		F	C			C	F	F			A	
Approach Delay (s)		101.9			26.3			130.4			2.1	
Approach LOS		F			C			F			A	

Intersection Summary			
HCM Average Control Delay	77.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: 51st St. & Broadway

5/22/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	250	500	144	290	690	490	204	858	261	90	480	517
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			0.91			0.86	0.86
Frpb, ped/bikes	1.00	0.99		1.00	0.98			0.97			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.97		1.00	0.94			0.97			1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	0.98
Satd. Flow (prot)	1770	3380		1770	3252			4750			1522	4722
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.95	0.98
Satd. Flow (perm)	1770	3380		1770	3252			4750			1522	4722
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	250	500	144	290	690	490	204	858	261	90	480	517
RTOR Reduction (vph)	0	24	0	0	64	0	0	38	0	0	0	0
Lane Group Flow (vph)	250	620	0	290	1116	0	0	1285	0	0	287	800
Confl. Peds. (#/hr)	30		35	35		30	33		99		99	
Confl. Bikes (#/hr)			2			3			2			
Turn Type	Prot			Prot			Split			Split	Split	
Protected Phases	1	6		5	2		8	8		4	4	4
Permitted Phases												
Actuated Green, G (s)	15.0	28.5		15.0	28.5			27.5			23.0	23.0
Effective Green, g (s)	15.0	28.5		15.0	28.5			27.5			23.0	23.0
Actuated g/C Ratio	0.14	0.26		0.14	0.26			0.25			0.21	0.21
Clearance Time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	241	876		241	843			1188			318	987
v/s Ratio Prot	0.14	0.18		c0.16	c0.34			c0.27			c0.19	0.17
v/s Ratio Perm												
v/c Ratio	1.04	0.71		1.20	1.32			1.08			0.90	0.81
Uniform Delay, d1	47.5	37.0		47.5	40.8			41.2			42.4	41.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	68.0	2.6		124.1	154.1			51.1			30.8	7.2
Delay (s)	115.5	39.6		171.6	194.9			92.3			73.2	48.6
Level of Service	F	D		F	F			F			E	D
Approach Delay (s)		60.8			190.3			92.3				52.0
Approach LOS		E			F			F				D

Intersection Summary			
HCM Average Control Delay	105.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	110.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	220
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1469
Flt Permitted	1.00
Satd. Flow (perm)	1469
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	220
RTOR Reduction (vph)	174
Lane Group Flow (vph)	46
Confl. Peds. (#/hr)	33
Confl. Bikes (#/hr)	12
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	23.0
Effective Green, g (s)	23.0
Actuated g/C Ratio	0.21
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	307
v/s Ratio Prot	
v/s Ratio Perm	0.03
v/c Ratio	0.15
Uniform Delay, d1	35.5
Progression Factor	1.00
Incremental Delay, d2	1.0
Delay (s)	36.5
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL2	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	330	310	208	60	180	50	168	994	70	60	1051	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95			0.95	
Frpb, ped/bikes	1.00	0.98			0.99		1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	
Frt	1.00	0.94			0.97		1.00	0.99			0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3253			3353		1769	3483			3377	
Flt Permitted	0.40	1.00			0.79		0.09	1.00			0.84	
Satd. Flow (perm)	738	3253			2659		171	3483			2847	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	310	208	60	180	50	168	994	70	60	1051	270
RTOR Reduction (vph)	0	102	0	0	0	0	0	5	0	0	20	0
Lane Group Flow (vph)	330	416	0	0	290	0	168	1059	0	0	1361	0
Confl. Peds. (#/hr)			47	47		72	69		89	89		69
Confl. Bikes (#/hr)			6			9			11			12
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	7	4			8		1	6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	23.1	23.1			16.1		48.9	48.9			41.9	
Effective Green, g (s)	23.1	23.1			16.1		48.9	48.9			41.9	
Actuated g/C Ratio	0.29	0.29			0.20		0.61	0.61			0.52	
Clearance Time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	265	939			535		184	2129			1491	
v/s Ratio Prot	c0.06	0.13					c0.05	0.30				
v/s Ratio Perm	c0.30				0.11		c0.51				0.48	
v/c Ratio	1.25	0.44			0.54		0.91	0.50			0.91	
Uniform Delay, d1	28.6	23.2			28.6		13.3	8.7			17.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	138.0	0.3			1.1		42.3	0.8			10.1	
Delay (s)	166.5	23.5			29.8		55.5	9.5			27.4	
Level of Service	F	C			C		E	A			C	
Approach Delay (s)		79.2			29.8			15.8			27.4	
Approach LOS		E			C			B			C	

Intersection Summary			
HCM Average Control Delay	35.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	147.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SWR2
Lane Configurations	
Volume (vph)	70
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	1492
Flt Permitted	1.00
Satd. Flow (perm)	1492
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	70
RTOR Reduction (vph)	33
Lane Group Flow (vph)	37
Confl. Peds. (#/hr)	72
Confl. Bikes (#/hr)	9
Turn Type	custom
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	41.9
Effective Green, g (s)	41.9
Actuated g/C Ratio	0.52
Clearance Time (s)	5.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	781
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.05
Uniform Delay, d1	9.3
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	9.4
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	378	168	100	598	340	228	936	110	230	865	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.97		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		0.99	1.00	
Frt		0.97			0.95		1.00	0.98		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		4783			4677		1752	3453		1752	3411	
Flt Permitted		0.68			0.76		0.19	1.00		0.18	1.00	
Satd. Flow (perm)		3283			3559		351	3453		337	3411	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	210	378	168	100	598	340	228	936	110	230	865	160
RTOR Reduction (vph)	0	62	0	0	22	0	0	11	0	0	18	0
Lane Group Flow (vph)	0	694	0	0	1016	0	228	1035	0	230	1007	0
Confl. Peds. (#/hr)	71		32	32		71	60		62	62		60
Confl. Bikes (#/hr)			2			5			41			44
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.2			28.2		36.3	36.3		36.3	36.3	
Effective Green, g (s)		28.2			28.2		36.3	36.3		36.3	36.3	
Actuated g/C Ratio		0.38			0.38		0.48	0.48		0.48	0.48	
Clearance Time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		1234			1338		170	1671		163	1651	
v/s Ratio Prot								0.30			0.30	
v/s Ratio Perm		0.21			c0.29		0.65			c0.68		
v/c Ratio		1.06dl			0.76		1.34	0.62		1.41	0.61	
Uniform Delay, d1		18.5			20.4		19.4	14.3		19.4	14.2	
Progression Factor		1.00			1.00		0.96	0.89		0.81	0.74	
Incremental Delay, d2		0.4			2.2		185.1	1.6		207.9	1.1	
Delay (s)		18.9			22.7		203.6	14.2		223.5	11.7	
Level of Service		B			C		F	B		F	B	
Approach Delay (s)		18.9			22.7			48.1			50.5	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	37.6	HCM Level of Service	D
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: W MacArthur Blvd. & Broadway

5/22/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	490	108	140	580	510	218	632	100	460	778	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.84	1.00	1.00	0.97	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1556	1770	3539	1337	1770	3539	1535	1770	3539	1458
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1556	1770	3539	1337	1770	3539	1535	1770	3539	1458
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	490	108	140	580	510	218	632	100	460	778	150
RTOR Reduction (vph)	0	0	79	0	0	374	0	0	76	0	0	71
Lane Group Flow (vph)	160	490	29	140	580	136	218	632	24	460	778	79
Confl. Peds. (#/hr)	108		3	3		108	63		3	3		63
Confl. Bikes (#/hr)			2			12			17	17		
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	31.9	31.9	9.0	31.9	31.9	17.2	29.1	29.1	32.0	43.9	43.9
Effective Green, g (s)	9.0	31.9	31.9	9.0	31.9	31.9	17.2	29.1	29.1	32.0	43.9	43.9
Actuated g/C Ratio	0.08	0.27	0.27	0.08	0.27	0.27	0.14	0.24	0.24	0.27	0.37	0.37
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	133	941	414	133	941	355	254	858	372	472	1295	533
v/s Ratio Prot	c0.09	0.14		c0.08	c0.16		c0.12	c0.18		c0.26	0.22	
v/s Ratio Perm			0.02			0.10			0.02			0.05
v/c Ratio	1.20	0.52	0.07	1.05	0.62	0.38	0.86	0.74	0.07	0.97	0.60	0.15
Uniform Delay, d1	55.5	37.5	32.9	55.5	38.7	36.0	50.2	41.9	35.0	43.6	30.9	25.5
Progression Factor	1.00	1.00	1.00	0.73	0.62	1.95	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	142.7	2.1	0.3	90.0	2.8	2.9	23.8	3.3	0.1	34.6	0.8	0.1
Delay (s)	198.2	39.6	33.3	130.7	26.8	73.1	74.0	45.2	35.1	78.2	31.7	25.6
Level of Service	F	D	C	F	C	E	E	D	D	E	C	C
Approach Delay (s)		72.2			57.8			50.8			46.5	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM Average Control Delay	55.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	880	50	164	780	300	60	231	326	290	100	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.96		1.00	1.00	0.80	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5038		1770	4673		1770	1863	1261	1770	1704	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5038		1770	4673		1770	1863	1261	1770	1704	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	880	50	164	780	300	60	231	326	290	100	110
RTOR Reduction (vph)	0	4	0	0	48	0	0	0	267	0	39	0
Lane Group Flow (vph)	110	926	0	164	1032	0	60	231	59	290	171	0
Confl. Peds. (#/hr)	50					50			101	101		
Confl. Bikes (#/hr)			3						2			2
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	11.7	44.2		14.4	46.9		6.7	21.7	21.7	22.7	37.7	
Effective Green, g (s)	11.7	44.2		14.4	46.9		6.7	21.7	21.7	22.7	37.7	
Actuated g/C Ratio	0.10	0.37		0.12	0.39		0.06	0.18	0.18	0.19	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	173	1856		212	1826		99	337	228	335	535	
v/s Ratio Prot	c0.06	0.18		c0.09	c0.22		0.03	c0.12		c0.16	0.10	
v/s Ratio Perm									0.05			
v/c Ratio	0.64	0.50		0.77	0.57		0.61	0.69	0.26	0.87	0.32	
Uniform Delay, d1	52.1	29.3		51.2	28.6		55.4	46.0	42.2	47.2	31.4	
Progression Factor	0.55	0.33		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.0	0.7		14.7	1.3		7.0	4.6	0.2	19.6	0.1	
Delay (s)	32.8	10.4		65.9	29.8		62.4	50.5	42.5	66.7	31.5	
Level of Service	C	B		E	C		E	D	D	E	C	
Approach Delay (s)		12.8			34.6			47.4			51.9	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	32.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6: Piedmont Ave. & Broadway 5/22/2013

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	284	30	779	437	100	888
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		8.5	8.5	8.5	8.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00		1.00	0.91	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	0.99	1.00
Frt	0.99		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3394		3539	1442	1758	3539
Flt Permitted	0.96		1.00	1.00	0.35	1.00
Satd. Flow (perm)	3394		3539	1442	650	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	284	30	779	437	100	888
RTOR Reduction (vph)	11	0	0	208	0	0
Lane Group Flow (vph)	303	0	779	229	100	888
Confl. Peds. (#/hr)		11		15	15	
Confl. Bikes (#/hr)		15		49		
Turn Type				custom	Perm	
Protected Phases	8		2 10			10
Permitted Phases				2	10	
Actuated Green, G (s)	16.5		45.0	13.7	22.8	22.8
Effective Green, g (s)	16.5		45.0	13.7	22.8	22.8
Actuated g/C Ratio	0.22		0.60	0.18	0.30	0.30
Clearance Time (s)	5.0			8.5	8.5	8.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	747		2123	263	198	1076
v/s Ratio Prot	c0.09		0.22			c0.25
v/s Ratio Perm				c0.16	0.15	
v/c Ratio	0.41		0.37	0.87	0.51	0.83
Uniform Delay, d1	25.1		7.7	29.8	21.5	24.2
Progression Factor	1.00		0.07	1.61	1.00	1.00
Incremental Delay, d2	0.1		0.2	16.1	8.9	7.2
Delay (s)	25.2		0.7	64.1	30.4	31.5
Level of Service	C		A	E	C	C
Approach Delay (s)	25.2		23.5			31.4
Approach LOS	C		C			C

Intersection Summary			
HCM Average Control Delay	26.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	10	77	90	10	90	87	1053	90	110	1143	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		0.99			0.99		1.00	1.00		0.99	1.00	
Frt		0.94			0.94		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1665			1666		1764	3475		1755	3492	
Flt Permitted		0.82			0.82		0.16	1.00		0.18	1.00	
Satd. Flow (perm)		1399			1393		291	3475		333	3492	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	73	10	77	90	10	90	87	1053	90	110	1143	79
RTOR Reduction (vph)	0	44	0	0	44	0	0	8	0	0	7	0
Lane Group Flow (vph)	0	116	0	0	146	0	87	1135	0	110	1215	0
Confl. Peds. (#/hr)	19		25	25		19	23		53	53		23
Confl. Bikes (#/hr)									21			23
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		42.0	42.0		42.0	42.0	
Effective Green, g (s)		24.0			24.0		42.0	42.0		42.0	42.0	
Actuated g/C Ratio		0.32			0.32		0.56	0.56		0.56	0.56	
Clearance Time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		448			446		163	1946		186	1956	
v/s Ratio Prot								0.33			c0.35	
v/s Ratio Perm		0.08			c0.11		0.30			0.33		
v/c Ratio		0.26			0.33		0.53	0.58		0.59	0.62	
Uniform Delay, d1		18.9			19.4		10.4	10.8		10.9	11.1	
Progression Factor		1.00			1.00		0.58	0.49		1.25	1.25	
Incremental Delay, d2		1.4			2.0		10.8	1.2		12.0	1.4	
Delay (s)		20.3			21.3		16.8	6.4		25.6	15.3	
Level of Service		C			C		B	A		C	B	
Approach Delay (s)		20.3			21.3			7.1			16.2	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	80	60	130	70	121	90	868	130	142	938	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.97		1.00	0.97		1.00	1.00	
Flpb, ped/bikes		0.99			0.98		0.99	1.00		0.96	1.00	
Frt		0.96			0.95		1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1703			1652		1756	3373		1706	3495	
Flt Permitted		0.85			0.78		0.23	1.00		0.22	1.00	
Satd. Flow (perm)		1475			1309		421	3373		402	3495	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	80	60	130	70	121	90	868	130	142	938	50
RTOR Reduction (vph)	0	22	0	0	29	0	0	16	0	0	5	0
Lane Group Flow (vph)	0	168	0	0	292	0	90	982	0	142	983	0
Confl. Peds. (#/hr)	61		67	67		61	38		177	177		38
Confl. Bikes (#/hr)			8			15			63			63
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		41.0	41.0		41.0	41.0	
Effective Green, g (s)		24.0			24.0		41.0	41.0		41.0	41.0	
Actuated g/C Ratio		0.32			0.32		0.55	0.55		0.55	0.55	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		472			419		230	1844		220	1911	
v/s Ratio Prot								0.29			0.28	
v/s Ratio Perm		0.11			c0.22		0.21			c0.35		
v/c Ratio		0.35			0.70		0.39	0.53		0.65	0.51	
Uniform Delay, d1		19.6			22.3		9.8	10.9		11.9	10.7	
Progression Factor		1.00			1.00		0.95	0.99		0.71	0.70	
Incremental Delay, d2		2.1			9.2		4.4	1.0		11.3	0.8	
Delay (s)		21.6			31.5		13.7	11.7		19.7	8.3	
Level of Service		C			C		B	B		B	A	
Approach Delay (s)		21.6			31.5			11.9			9.7	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	385	180	50	450	190	230	695	50	140	706	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3340		1770	3335		1749	3486		1744	3321	
Flt Permitted	0.95	1.00		0.95	1.00		0.18	1.00		0.28	1.00	
Satd. Flow (perm)	1770	3340		1770	3335		339	3486		518	3321	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	169	385	180	50	450	190	230	695	50	140	706	258
RTOR Reduction (vph)	0	69	0	0	65	0	0	7	0	0	47	0
Lane Group Flow (vph)	169	496	0	50	575	0	230	738	0	140	917	0
Confl. Peds. (#/hr)	20		11	11		20	68		56	56		68
Confl. Bikes (#/hr)			8			18			33			36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.6	25.5		4.6	20.5		31.4	31.4		31.4	31.4	
Effective Green, g (s)	10.1	25.0		5.1	20.0		32.9	32.9		32.9	32.9	
Actuated g/C Ratio	0.13	0.33		0.07	0.27		0.44	0.44		0.44	0.44	
Clearance Time (s)	4.5	3.5		4.5	3.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	238	1113		120	889		149	1529		227	1457	
v/s Ratio Prot	c0.10	0.15		0.03	c0.17			0.21			0.28	
v/s Ratio Perm							c0.68			0.27		
v/c Ratio	0.71	0.45		0.42	0.65		1.54	0.48		0.62	0.63	
Uniform Delay, d1	31.0	19.6		33.5	24.4		21.1	15.0		16.2	16.3	
Progression Factor	1.00	1.00		1.04	0.75		0.96	0.91		1.15	1.11	
Incremental Delay, d2	8.0	0.1		0.8	1.1		270.6	0.9		11.3	2.0	
Delay (s)	39.1	19.7		35.6	19.3		290.8	14.5		30.0	20.0	
Level of Service	D	B		D	B		F	B		C	C	
Approach Delay (s)		24.1			20.5			79.7			21.3	
Approach LOS		C			C			E			C	

Intersection Summary			
HCM Average Control Delay	38.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: 27th St. & Broadway

5/22/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	350	80	40	360	376	130	767	30	278	910	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99			1.00	0.92	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.98	1.00			1.00	1.00	0.99	1.00		0.99	1.00	
Frt	1.00	0.97			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1727	3418			3520	1452	1756	3509		1746	3418	
Flt Permitted	0.49	1.00			0.88	1.00	0.16	1.00		0.27	1.00	
Satd. Flow (perm)	892	3418			3116	1452	287	3509		489	3418	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	350	80	40	360	376	130	767	30	278	910	160
RTOR Reduction (vph)	0	26	0	0	0	45	0	4	0	0	19	0
Lane Group Flow (vph)	155	404	0	0	400	331	130	793	0	278	1051	0
Confl. Peds. (#/hr)	57		15	15		57	63		67	67		63
Confl. Bikes (#/hr)			25			61			48			61
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		3			4			1			1	
Permitted Phases	3			4		4	1			1		
Actuated Green, G (s)	31.0	31.0			31.0	31.0	33.0	33.0		33.0	33.0	
Effective Green, g (s)	32.5	32.5			32.5	32.5	34.5	34.5		34.5	34.5	
Actuated g/C Ratio	0.43	0.43			0.43	0.43	0.46	0.46		0.46	0.46	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Grp Cap (vph)	387	1481			1350	629	132	1614		225	1572	
v/s Ratio Prot		0.12						0.23			0.31	
v/s Ratio Perm	0.17				0.13	c0.23	0.45			c0.57		
v/c Ratio	0.40	0.27			0.30	0.53	0.98	0.49		1.24	0.67	
Uniform Delay, d1	14.6	13.7			13.8	15.6	20.0	14.1		20.2	15.8	
Progression Factor	1.35	1.32			1.00	1.00	1.48	1.50		1.07	1.05	
Incremental Delay, d2	2.7	0.4			0.6	3.1	70.4	1.0		135.8	2.1	
Delay (s)	22.4	18.5			14.4	18.7	100.0	22.1		157.4	18.7	
Level of Service	C	B			B	B	F	C		F	B	
Approach Delay (s)		19.5			16.5			33.0			47.3	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM Average Control Delay	32.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	200	438	130	70	90	20	387	350	30	249	620	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00			1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.35			1.00	1.00	0.64		1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85			1.00	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	561			1770	1863	1019		3433	3372	
Flt Permitted	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	561			1770	1863	1019		3433	3372	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	438	130	70	90	20	387	350	30	249	620	110
RTOR Reduction (vph)	0	0	12	0	0	0	0	206	0	0	9	0
Lane Group Flow (vph)	200	438	188	0	0	110	387	144	0	279	721	0
Confl. Peds. (#/hr)			72	72				175				86
Confl. Bikes (#/hr)			42	42				72				13
Turn Type	Prot		Perm		Prot	Prot		Perm	Prot	Prot		
Protected Phases	10	4			3	3	8		5	5	2	
Permitted Phases			4					8				
Actuated Green, G (s)	25.5	20.0	20.0			10.0	35.0	35.0		14.9	58.0	
Effective Green, g (s)	25.5	20.0	20.0			10.0	35.0	35.0		14.9	58.0	
Actuated g/C Ratio	0.16	0.12	0.12			0.06	0.22	0.22		0.09	0.36	
Clearance Time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0			3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	282	442	70			111	408	223		320	1222	
v/s Ratio Prot	c0.11	0.12				0.06	c0.21			0.08	c0.21	
v/s Ratio Perm			c0.33					0.14				
v/c Ratio	0.71	0.99	2.68			0.99	0.95	0.64		0.87	0.59	
Uniform Delay, d1	63.7	69.9	70.0			75.0	61.6	56.8		71.6	41.4	
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.9	40.3	796.0			82.4	31.3	6.3		22.0	2.1	
Delay (s)	71.7	110.2	866.0			157.3	92.9	63.1		93.6	43.5	
Level of Service	E	F	F			F	F	E		F	D	
Approach Delay (s)		281.4					88.9				57.3	
Approach LOS		F					F				E	

Intersection Summary			
HCM Average Control Delay	120.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	270	550	50	120
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	0.93		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.96		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3172		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3172		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	270	550	50	120
RTOR Reduction (vph)	0	10	0	0
Lane Group Flow (vph)	270	710	0	0
Confl. Peds. (#/hr)			87	87
Confl. Bikes (#/hr)			11	11
Turn Type	Prot			
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	21.5	64.6		
Effective Green, g (s)	21.5	64.6		
Actuated g/C Ratio	0.13	0.40		
Clearance Time (s)	5.0	5.0		
Vehicle Extension (s)	3.0	3.0		
Lane Grp Cap (vph)	238	1281		
v/s Ratio Prot	c0.15	0.22		
v/s Ratio Perm				
v/c Ratio	1.13	0.55		
Uniform Delay, d1	69.2	36.6		
Progression Factor	1.00	1.00		
Incremental Delay, d2	99.4	1.7		
Delay (s)	168.6	38.4		
Level of Service	F	D		
Approach Delay (s)		73.9		
Approach LOS		E		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	182	690	100	120	560	100	140	645	200	110	677	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98			0.98		1.00	1.00	0.87	1.00	0.97	
Flpb, ped/bikes	0.97	1.00			0.99		0.97	1.00	1.00	0.96	1.00	
Frt	1.00	0.98			0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1718	3398			3368		1716	3539	1374	1694	3331	
Flt Permitted	0.25	1.00			0.65		0.25	1.00	1.00	0.35	1.00	
Satd. Flow (perm)	457	3398			2199		454	3539	1374	626	3331	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	182	690	100	120	560	100	140	645	200	110	677	173
RTOR Reduction (vph)	0	17	0	0	17	0	0	0	23	0	30	0
Lane Group Flow (vph)	182	773	0	0	763	0	140	645	177	110	820	0
Confl. Peds. (#/hr)	125		182	182		125	141		139	139		141
Confl. Bikes (#/hr)			23			23			19			44
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	29.5	29.5			29.5		34.5	34.5	34.5	34.5	34.5	
Effective Green, g (s)	29.5	29.5			29.5		34.5	34.5	34.5	34.5	34.5	
Actuated g/C Ratio	0.41	0.41			0.41		0.48	0.48	0.48	0.48	0.48	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	187	1392			901		218	1696	658	300	1596	
v/s Ratio Prot		0.23						0.18			0.25	
v/s Ratio Perm	c0.40				0.35		c0.31		0.13	0.18		
v/c Ratio	0.97	0.56			0.85		0.64	0.38	0.27	0.37	0.51	
Uniform Delay, d1	20.9	16.2			19.2		14.1	11.9	11.2	11.8	13.0	
Progression Factor	1.00	1.00			1.19		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	57.4	0.3			6.4		13.7	0.6	1.0	3.4	1.2	
Delay (s)	78.3	16.5			29.2		27.8	12.6	12.2	15.3	14.1	
Level of Service	E	B			C		C	B	B	B	B	
Approach Delay (s)		28.1			29.2			14.7			14.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	21.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			113			
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

61: Hawthorne Ave. & Broadway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	0	130	0	0	30	150	1006	30	0	962	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	4.0			4.0	8.5	8.5			8.5	
Lane Util. Factor		1.00	1.00			1.00	1.00	0.95			0.95	
Frpb, ped/bikes		1.00	0.97			0.99	1.00	1.00			0.98	
Flpb, ped/bikes		1.00	1.00			1.00	0.99	1.00			1.00	
Frt		1.00	0.85			0.86	1.00	1.00			0.97	
Flt Protected		0.95	1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1765	1541			1588	1743	3507			3371	
Flt Permitted		0.95	1.00			1.00	0.24	1.00			1.00	
Satd. Flow (perm)		1765	1541			1588	447	3507			3371	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	0	130	0	0	30	150	1006	30	0	962	200
RTOR Reduction (vph)	0	0	80	0	0	23	0	3	0	0	23	0
Lane Group Flow (vph)	0	200	50	0	0	7	150	1033	0	0	1139	0
Confl. Peds. (#/hr)	2		11	11		2	32		34	34		32
Confl. Bikes (#/hr)			2						59			61
Turn Type	custom		custom			custom	Perm					
Protected Phases		2						10			7 10	
Permitted Phases	1		1			3	10					
Actuated Green, G (s)		13.7	18.2			17.5	22.8	22.8			44.3	
Effective Green, g (s)		13.7	18.2			17.5	22.8	22.8			44.3	
Actuated g/C Ratio		0.18	0.24			0.23	0.30	0.30			0.59	
Clearance Time (s)		8.5	4.0			4.0	8.5	8.5				
Vehicle Extension (s)		2.0	2.0			2.0	2.0	2.0				
Lane Grp Cap (vph)		322	374			371	136	1066			1991	
v/s Ratio Prot								0.29			c0.34	
v/s Ratio Perm		0.11	0.03			0.00	c0.34					
v/c Ratio		0.62	0.13			0.02	1.10	0.97			0.57	
Uniform Delay, d1		28.3	22.2			22.1	26.1	25.8			9.5	
Progression Factor		1.00	1.00			1.00	0.64	0.62			0.31	
Incremental Delay, d2		8.7	0.1			0.1	101.0	18.9			0.8	
Delay (s)		37.0	22.3			22.2	117.6	34.8			3.7	
Level of Service		D	C			C	F	C			A	
Approach Delay (s)		31.2			22.2			45.3			3.7	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM Average Control Delay	25.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Appendix B6

LOS Calculation Worksheets
2035 Plus Project Conditions

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	300	850	100	230	400	460	120	1320	260	80	510	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			0.91			0.86	0.86
Frpb, ped/bikes	1.00	1.00		1.00	0.98			0.99			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.92			0.98			1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.95	0.98
Satd. Flow (prot)	1770	3472		1770	3180			4890			1522	4724
Flt Permitted	0.95	1.00		0.95	1.00			1.00			0.95	0.98
Satd. Flow (perm)	1770	3472		1770	3180			4890			1522	4724
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	300	850	100	230	400	460	120	1320	260	80	510	560
RTOR Reduction (vph)	0	8	0	0	184	0	0	23	0	0	0	0
Lane Group Flow (vph)	300	942	0	230	676	0	0	1677	0	0	294	856
Confl. Peds. (#/hr)			11			24			44			
Confl. Bikes (#/hr)			9			5			8			
Turn Type	Prot			Prot			Split			Split	Split	
Protected Phases	1	6		5	2		8	8		4	4	4
Permitted Phases												
Actuated Green, G (s)	15.0	28.5		15.0	28.5			27.5			23.0	23.0
Effective Green, g (s)	15.0	28.5		15.0	28.5			27.5			23.0	23.0
Actuated g/C Ratio	0.14	0.26		0.14	0.26			0.25			0.21	0.21
Clearance Time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	241	900		241	824			1223			318	988
v/s Ratio Prot	c0.17	c0.27		0.13	0.21			c0.34			c0.19	0.18
v/s Ratio Perm												
v/c Ratio	1.24	1.05		0.95	0.82			1.37			0.92	0.87
Uniform Delay, d1	47.5	40.8		47.2	38.3			41.2			42.6	42.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	140.0	42.9		45.0	6.6			172.2			34.4	10.1
Delay (s)	187.5	83.6		92.2	44.9			213.5			77.1	52.1
Level of Service	F	F		F	D			F			E	D
Approach Delay (s)		108.6			54.9			213.5				56.2
Approach LOS		F			D			F				E

Intersection Summary			
HCM Average Control Delay	118.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	130
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.97
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1530
Flt Permitted	1.00
Satd. Flow (perm)	1530
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	130
RTOR Reduction (vph)	103
Lane Group Flow (vph)	27
Confl. Peds. (#/hr)	9
Confl. Bikes (#/hr)	8
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	23.0
Effective Green, g (s)	23.0
Actuated g/C Ratio	0.21
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	320
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.08
Uniform Delay, d1	35.0
Progression Factor	1.00
Incremental Delay, d2	0.5
Delay (s)	35.5
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL2	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	450	390	220	50	300	70	230	1380	80	30	650	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95			0.95	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00			0.98	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	
Frt	1.00	0.95			0.97		1.00	0.99			0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3299			3402		1765	3494			3361	
Flt Permitted	0.30	1.00			0.83		0.23	1.00			0.86	
Satd. Flow (perm)	568	3299			2852		436	3494			2882	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	450	390	220	50	300	70	230	1380	80	30	650	190
RTOR Reduction (vph)	0	121	0	0	0	0	0	4	0	0	25	0
Lane Group Flow (vph)	450	489	0	0	420	0	230	1456	0	0	845	0
Confl. Peds. (#/hr)			26	26		33	69		78	78		69
Confl. Bikes (#/hr)			11			5			21			15
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	7	4			8		1	6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	25.6	25.6			18.6		46.4	46.4			39.4	
Effective Green, g (s)	25.6	25.6			18.6		46.4	46.4			39.4	
Actuated g/C Ratio	0.32	0.32			0.23		0.58	0.58			0.49	
Clearance Time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	242	1056			663		319	2027			1419	
v/s Ratio Prot	c0.09	0.15					0.04	c0.42				
v/s Ratio Perm	c0.50				0.15		c0.38				0.29	
v/c Ratio	1.86	0.46			0.63		0.72	0.72			0.60	
Uniform Delay, d1	27.3	21.7			27.6		11.3	12.1			14.6	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	402.2	0.3			2.0		7.8	2.2			1.8	
Delay (s)	429.5	22.0			29.6		19.1	14.3			16.4	
Level of Service	F	C			C		B	B			B	
Approach Delay (s)		195.0			29.6			15.0			16.4	
Approach LOS		F			C			B			B	

Intersection Summary			
HCM Average Control Delay	63.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	127.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SWR2
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	1611
Flt Permitted	1.00
Satd. Flow (perm)	1611
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	30
RTOR Reduction (vph)	15
Lane Group Flow (vph)	15
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Turn Type	custom
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	39.4
Effective Green, g (s)	39.4
Actuated g/C Ratio	0.49
Clearance Time (s)	5.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	793
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.02
Uniform Delay, d1	10.4
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	10.4
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
3: W MacArthur Blvd. & Telegraph Ave.

5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	740	350	200	820	340	320	1200	80	290	810	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.97			0.97		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		0.99	1.00	
Frt		0.96			0.96		1.00	0.99		1.00	0.97	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		4698			4723		1752	3491		1760	3387	
Flt Permitted		0.65			0.65		0.17	1.00		0.10	1.00	
Satd. Flow (perm)		3084			3086		316	3491		190	3387	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	740	350	200	820	340	320	1200	80	290	810	200
RTOR Reduction (vph)	0	43	0	0	2	0	0	3	0	0	15	0
Lane Group Flow (vph)	0	1247	0	0	1358	0	320	1277	0	290	995	0
Confl. Peds. (#/hr)	83		81	81		83	56		57	57		56
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		38.3			38.3		39.0	39.0		39.0	39.0	
Effective Green, g (s)		38.3			38.3		39.0	39.0		39.0	39.0	
Actuated g/C Ratio		0.44			0.44		0.44	0.44		0.44	0.44	
Clearance Time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		1345			1346		140	1551		84	1504	
v/s Ratio Prot								0.37			0.29	
v/s Ratio Perm		0.40			c0.44		1.01			c1.53		
v/c Ratio		1.45dl			1.80dl		2.29	0.82		3.45	0.66	
Uniform Delay, d1		23.4			24.8		24.4	21.4		24.4	19.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.9			26.7		600.6	3.5		1133.0	0.9	
Delay (s)		34.3			51.4		625.0	24.9		1157.4	20.1	
Level of Service		C			D		F	C		F	C	
Approach Delay (s)		34.3			51.4			144.9			273.8	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM Average Control Delay	126.5	HCM Level of Service	F
HCM Volume to Capacity ratio	2.23		
Actuated Cycle Length (s)	87.8	Sum of lost time (s)	10.5
Intersection Capacity Utilization	126.1%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	1000	140	210	940	350	340	1190	210	320	700	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.90	1.00	1.00	0.89	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1477	1770	3539	1421	1770	3539	1417	1770	3539	1525
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1477	1770	3539	1421	1770	3539	1417	1770	3539	1525
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	1000	140	210	940	350	340	1190	210	320	700	80
RTOR Reduction (vph)	0	0	88	0	0	234	0	0	111	0	0	41
Lane Group Flow (vph)	200	1000	52	210	940	116	340	1190	100	320	700	39
Confl. Peds. (#/hr)			44			72			87			23
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.0	33.0	33.0	13.0	34.0	34.0	23.0	35.0	35.0	21.0	33.0	33.0
Effective Green, g (s)	12.0	33.0	33.0	13.0	34.0	34.0	23.0	35.0	35.0	21.0	33.0	33.0
Actuated g/C Ratio	0.10	0.28	0.28	0.11	0.28	0.28	0.19	0.29	0.29	0.18	0.28	0.28
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	177	973	406	192	1003	403	339	1032	413	310	973	419
v/s Ratio Prot	0.11	c0.28		c0.12	0.27		c0.19	c0.34		0.18	0.20	
v/s Ratio Perm			0.04			0.08			0.07			0.03
v/c Ratio	1.13	1.03	0.13	1.09	0.94	0.29	1.00	1.15	0.24	1.03	0.72	0.09
Uniform Delay, d1	54.0	43.5	32.7	53.5	42.0	33.6	48.5	42.5	32.4	49.5	39.3	32.4
Progression Factor	1.00	1.00	1.00	1.38	0.66	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	106.9	36.2	0.7	82.0	13.0	1.3	49.6	80.2	0.3	59.7	2.6	0.1
Delay (s)	160.9	79.7	33.3	156.0	40.8	23.9	98.1	122.7	32.7	109.2	41.9	32.5
Level of Service	F	E	C	F	D	C	F	F	C	F	D	C
Approach Delay (s)		86.9			53.0			107.0			60.8	
Approach LOS		F			D			F			E	

Intersection Summary			
HCM Average Control Delay	79.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	1500	120	220	1340	230	130	270	500	240	120	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00	0.92	1.00	0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4942		1770	4903		1770	1863	1450	1770	1617	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4942		1770	4903		1770	1863	1450	1770	1617	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	1500	120	220	1340	230	130	270	500	240	120	120
RTOR Reduction (vph)	0	7	0	0	18	0	0	0	213	0	32	0
Lane Group Flow (vph)	110	1613	0	220	1552	0	130	270	287	240	208	0
Confl. Peds. (#/hr)	30		83	83		30	104		36	36		104
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	9.3	47.5		15.3	53.5		11.3	27.0	27.0	13.2	28.9	
Effective Green, g (s)	9.3	47.5		15.3	53.5		11.3	27.0	27.0	13.2	28.9	
Actuated g/C Ratio	0.08	0.40		0.13	0.45		0.09	0.22	0.22	0.11	0.24	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	137	1956		226	2186		167	419	326	195	389	
v/s Ratio Prot	0.06	c0.33		c0.12	0.32		0.07	0.14		c0.14	0.13	
v/s Ratio Perm									c0.20			
v/c Ratio	0.80	0.82		0.97	0.71		0.78	0.64	0.88	1.23	0.54	
Uniform Delay, d1	54.4	32.5		52.1	27.0		53.1	42.1	44.9	53.4	39.7	
Progression Factor	0.71	0.61		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.3	2.2		51.8	2.0		18.5	2.5	22.0	140.3	0.7	
Delay (s)	54.1	21.9		103.9	28.9		71.6	44.7	67.0	193.7	40.4	
Level of Service	D	C		F	C		E	D	E	F	D	
Approach Delay (s)		24.0			38.2			61.0			117.0	
Approach LOS		C			D			E			F	

Intersection Summary			
HCM Average Control Delay	45.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	430	120	1410	610	150	1030
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		8.5	8.5	8.5	8.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frpb, ped/bikes	0.98		1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3308		3539	1560	1770	3539
Flt Permitted	0.96		1.00	1.00	0.13	1.00
Satd. Flow (perm)	3308		3539	1560	234	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	430	120	1410	610	150	1030
RTOR Reduction (vph)	31	0	0	141	0	0
Lane Group Flow (vph)	519	0	1410	469	150	1030
Confl. Peds. (#/hr)		44		2		
Turn Type				custom	Perm	
Protected Phases	8		2 10			10
Permitted Phases				2	10	
Actuated Green, G (s)	17.5		54.0	13.7	31.8	31.8
Effective Green, g (s)	17.5		54.0	13.7	31.8	31.8
Actuated g/C Ratio	0.21		0.64	0.16	0.37	0.37
Clearance Time (s)	5.0			8.5	8.5	8.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	681		2248	251	88	1324
v/s Ratio Prot	c0.16		0.40			0.29
v/s Ratio Perm				c0.30	c0.64	
v/c Ratio	0.76		0.63	1.87	1.70	0.78
Uniform Delay, d1	31.8		9.4	35.6	26.6	23.5
Progression Factor	1.00		0.14	1.08	1.00	1.00
Incremental Delay, d2	4.5		0.1	392.4	360.6	4.6
Delay (s)	36.3		1.4	431.0	387.2	28.0
Level of Service	D		A	F	F	C
Approach Delay (s)	36.3		131.2			73.7
Approach LOS	D		F			E

Intersection Summary			
HCM Average Control Delay	99.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.48		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	10	170	90	20	100	131	1529	80	100	1260	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.97			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Frt		0.94			0.94		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1615			1638		1765	3500		1762	3480	
Flt Permitted		0.70			0.73		0.13	1.00		0.08	1.00	
Satd. Flow (perm)		1164			1225		243	3500		153	3480	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	191	10	170	90	20	100	131	1529	80	100	1260	120
RTOR Reduction (vph)	0	36	0	0	20	0	0	4	0	0	9	0
Lane Group Flow (vph)	0	335	0	0	190	0	131	1605	0	100	1371	0
Confl. Peds. (#/hr)	70		49	49		51	27		65	65		27
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		52.0	52.0		52.0	52.0	
Effective Green, g (s)		24.0			24.0		52.0	52.0		52.0	52.0	
Actuated g/C Ratio		0.28			0.28		0.61	0.61		0.61	0.61	
Clearance Time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		329			346		149	2141		94	2129	
v/s Ratio Prot								0.46			0.39	
v/s Ratio Perm		c0.29			0.15		0.54			c0.65		
v/c Ratio		1.02			0.55		0.88	0.75		1.06	0.64	
Uniform Delay, d1		30.5			25.9		13.9	11.8		16.5	10.6	
Progression Factor		1.00			1.00		0.36	0.35		1.60	1.76	
Incremental Delay, d2		54.4			6.1		30.2	1.3		100.1	1.2	
Delay (s)		84.9			32.0		35.2	5.5		126.4	19.8	
Level of Service		F			C		D	A		F	B	
Approach Delay (s)		84.9			32.0			7.7			27.0	
Approach LOS		F			C			A			C	

Intersection Summary			
HCM Average Control Delay	24.1	HCM Level of Service	C
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	140	90	110	80	100	70	1580	150	170	1280	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.94			0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			0.96		0.98	1.00		1.00	1.00	
Frt		0.96			0.95		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1652			1646		1742	3474		1765	3501	
Flt Permitted		0.83			0.66		0.14	1.00		0.08	1.00	
Satd. Flow (perm)		1390			1107		254	3474		146	3501	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	140	90	110	80	100	70	1580	150	170	1280	50
RTOR Reduction (vph)	0	18	0	0	17	0	0	8	0	0	3	0
Lane Group Flow (vph)	0	282	0	0	273	0	70	1722	0	170	1327	0
Confl. Peds. (#/hr)	40		181	181		40	141		53	53		141
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		51.0	51.0		51.0	51.0	
Effective Green, g (s)		24.0			24.0		51.0	51.0		51.0	51.0	
Actuated g/C Ratio		0.28			0.28		0.60	0.60		0.60	0.60	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		392			313		152	2084		88	2101	
v/s Ratio Prot								0.50			0.38	
v/s Ratio Perm		0.20			c0.25		0.28			c1.17		
v/c Ratio		0.72			0.87		0.46	0.83		1.93	0.63	
Uniform Delay, d1		27.5			29.0		9.4	13.5		17.0	10.9	
Progression Factor		1.00			1.00		1.25	1.25		0.42	0.40	
Incremental Delay, d2		10.8			26.7		5.8	2.3		447.9	1.1	
Delay (s)		38.3			55.7		17.5	19.2		455.1	5.4	
Level of Service		D			E		B	B		F	A	
Approach Delay (s)		38.3			55.7			19.1			56.4	
Approach LOS		D			E			B			E	

Intersection Summary			
HCM Average Control Delay	37.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.60		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	640	160	90	690	400	230	800	170	440	860	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.94		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3395		1770	3300		1767	3423		1767	3334	
Flt Permitted	0.95	1.00		0.95	1.00		0.10	1.00		0.19	1.00	
Satd. Flow (perm)	1770	3395		1770	3300		190	3423		351	3334	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	640	160	90	690	400	230	800	170	440	860	400
RTOR Reduction (vph)	0	24	0	0	85	0	0	22	0	0	66	0
Lane Group Flow (vph)	200	776	0	90	1005	0	230	948	0	440	1194	0
Confl. Peds. (#/hr)			30			18	14		9	9		14
Confl. Bikes (#/hr)			14			5			38			20
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	10.4	26.5		7.3	23.4		37.7	37.7		37.7	37.7	
Effective Green, g (s)	10.9	26.0		7.8	22.9		39.2	39.2		39.2	39.2	
Actuated g/C Ratio	0.13	0.31		0.09	0.27		0.46	0.46		0.46	0.46	
Clearance Time (s)	4.5	3.5		4.5	3.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	227	1038		162	889		88	1579		162	1538	
v/s Ratio Prot	c0.11	c0.23		0.05	c0.30			0.28			0.36	
v/s Ratio Perm							1.21			c1.25		
v/c Ratio	0.88	0.75		0.56	1.13		2.61	0.60		2.72	0.78	
Uniform Delay, d1	36.4	26.5		36.9	31.1		22.9	17.1		22.9	19.2	
Progression Factor	1.00	1.00		0.90	1.37		0.98	0.91		0.86	0.89	
Incremental Delay, d2	29.6	2.6		0.9	64.8		748.9	1.2		788.2	3.6	
Delay (s)	66.1	29.2		33.9	107.2		771.3	16.7		807.9	20.7	
Level of Service	E	C		C	F		F	B		F	C	
Approach Delay (s)		36.5			101.6			161.3			224.4	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM Average Control Delay	144.0	HCM Level of Service	F
HCM Volume to Capacity ratio	2.04		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	109.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	970	110	50	780	480	220	1110	90	400	860	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00	0.91	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00			1.00	1.00	0.99	1.00		0.99	1.00	
Frt	1.00	0.98			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1748	3471			3528	1434	1745	3471		1752	3387	
Flt Permitted	0.20	1.00			0.67	1.00	0.20	1.00		0.15	1.00	
Satd. Flow (perm)	364	3471			2380	1434	358	3471		268	3387	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	970	110	50	780	480	220	1110	90	400	860	180
RTOR Reduction (vph)	0	10	0	0	0	26	0	7	0	0	20	0
Lane Group Flow (vph)	200	1070	0	0	830	454	220	1193	0	400	1020	0
Confl. Peds. (#/hr)	57		23	23		57	95		93	93		95
Confl. Bikes (#/hr)			13			63			70			46
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		3			4			1			1	
Permitted Phases	3			4		4	1			1		
Actuated Green, G (s)	30.0	30.0			30.0	30.0	44.0	44.0		44.0	44.0	
Effective Green, g (s)	31.5	31.5			31.5	31.5	45.5	45.5		45.5	45.5	
Actuated g/C Ratio	0.37	0.37			0.37	0.37	0.54	0.54		0.54	0.54	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Grp Cap (vph)	135	1286			882	531	192	1858		143	1813	
v/s Ratio Prot		0.31						0.34			0.30	
v/s Ratio Perm	c0.55				0.35	0.32	0.61			c1.49		
v/c Ratio	1.48	0.83			0.94	0.86	1.15	0.64		2.80	0.56	
Uniform Delay, d1	26.8	24.3			25.9	24.7	19.8	14.0		19.8	13.1	
Progression Factor	1.03	1.06			1.00	1.00	1.88	2.11		1.14	1.07	
Incremental Delay, d2	220.3	0.6			19.0	16.1	100.8	1.3		823.1	1.0	
Delay (s)	247.8	26.5			44.8	40.7	138.0	30.8		845.6	15.0	
Level of Service	F	C			D	D	F	C		F	B	
Approach Delay (s)		61.1			43.3			47.4			245.7	
Approach LOS		E			D			D			F	

Intersection Summary			
HCM Average Control Delay	102.0	HCM Level of Service	F
HCM Volume to Capacity ratio	2.25		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	140.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	440	610	430	130	90	30	290	180	30	790	1570	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00			1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.59			1.00	1.00	0.84		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85			1.00	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	939			1770	1863	1325		3433	3461	
Flt Permitted	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	939			1770	1863	1325		3433	3461	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	440	610	430	130	90	30	290	180	30	790	1570	110
RTOR Reduction (vph)	0	0	7	0	0	0	0	135	0	0	3	0
Lane Group Flow (vph)	440	610	553	0	0	120	290	45	0	820	1677	0
Confl. Peds. (#/hr)			95					70				101
Confl. Bikes (#/hr)			4	4				2				4
Turn Type	Prot		Perm		Prot	Prot		Perm	Prot	Prot		
Protected Phases	10	4			3	3	8		5	5	2	
Permitted Phases			4					8				
Actuated Green, G (s)	28.0	20.0	20.0			10.0	35.0	35.0		15.0	58.0	
Effective Green, g (s)	28.0	20.0	20.0			10.0	35.0	35.0		15.0	58.0	
Actuated g/C Ratio	0.18	0.12	0.12			0.06	0.22	0.22		0.09	0.36	
Clearance Time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	2.0	2.0			2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	310	442	117			111	408	290		322	1255	
v/s Ratio Prot	c0.25	0.17				c0.07	0.16			c0.24	c0.48	
v/s Ratio Perm			c0.59					0.03				
v/c Ratio	1.42	1.38	4.73			1.08	0.71	0.15		2.55	1.34	
Uniform Delay, d1	66.0	70.0	70.0			75.0	57.8	50.5		72.5	51.0	
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	206.7	184.7	1696.2			108.9	4.8	0.1		705.0	156.7	
Delay (s)	272.7	254.7	1766.2			183.9	62.6	50.6		777.5	207.7	
Level of Service	F	F	F			F	E	D		F	F	
Approach Delay (s)		785.4					83.6				394.6	
Approach LOS		F					F				F	

Intersection Summary			
HCM Average Control Delay	402.8	HCM Level of Service	F
HCM Volume to Capacity ratio	2.01		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	117.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	200	800	60	130
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	0.92		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.97		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3169		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3169		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	800	60	130
RTOR Reduction (vph)	0	7	0	0
Lane Group Flow (vph)	200	983	0	0
Confl. Peds. (#/hr)			232	232
Confl. Bikes (#/hr)			23	23
Turn Type	Prot			
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	19.0	62.0		
Effective Green, g (s)	19.0	62.0		
Actuated g/C Ratio	0.12	0.39		
Clearance Time (s)	5.0	5.0		
Vehicle Extension (s)	2.0	2.0		
Lane Grp Cap (vph)	210	1228		
v/s Ratio Prot	0.11	c0.31		
v/s Ratio Perm				
v/c Ratio	0.95	0.80		
Uniform Delay, d1	70.1	43.5		
Progression Factor	1.00	1.00		
Incremental Delay, d2	48.1	5.5		
Delay (s)	118.1	49.0		
Level of Service	F	D		
Approach Delay (s)		60.6		
Approach LOS		E		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	1180	100	100	810	120	450	1130	280	150	630	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98			1.00		1.00	1.00	0.90	1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		0.96	1.00	1.00	0.99	1.00	
Frt	1.00	0.99			0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1765	3439			3441		1707	3539	1425	1753	3335	
Flt Permitted	0.15	1.00			0.55		0.27	1.00	1.00	0.14	1.00	
Satd. Flow (perm)	271	3439			1892		491	3539	1425	264	3335	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	180	1180	100	100	810	120	450	1130	280	150	630	160
RTOR Reduction (vph)	0	7	0	0	12	0	0	0	3	0	26	0
Lane Group Flow (vph)	180	1273	0	0	1018	0	450	1130	277	150	764	0
Confl. Peds. (#/hr)	15		228	228		15	148		70	70		148
Confl. Bikes (#/hr)			15			10			51			11
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	36.0	36.0			36.0		41.0	41.0	41.0	41.0	41.0	
Effective Green, g (s)	36.0	36.0			36.0		41.0	41.0	41.0	41.0	41.0	
Actuated g/C Ratio	0.42	0.42			0.42		0.48	0.48	0.48	0.48	0.48	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	115	1457			801		237	1707	687	127	1609	
v/s Ratio Prot		0.37						0.32			0.23	
v/s Ratio Perm	c0.66				0.54		c0.92		0.19	0.57		
v/c Ratio	1.57	0.87			1.27		1.90	0.66	0.40	1.18	0.47	
Uniform Delay, d1	24.5	22.4			24.5		22.0	16.7	14.1	22.0	14.8	
Progression Factor	1.02	1.02			1.73		1.00	1.00	1.00	0.99	0.91	
Incremental Delay, d2	271.0	2.6			130.3		419.9	2.0	1.8	136.2	1.0	
Delay (s)	296.0	25.4			172.8		441.9	18.8	15.9	158.1	14.5	
Level of Service	F	C			F		F	B	B	F	B	
Approach Delay (s)		58.7			172.8			120.7			37.4	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM Average Control Delay	98.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.74		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	129.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	27	223	110	161	148	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	223	110	161	148	25
Pedestrians		50	50		50	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		4	4		4	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			108			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	321				568	290
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	290				543	259
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				66	96
cM capacity (veh/h)	1188				438	698

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	250	271	173
Volume Left	27	0	148
Volume Right	0	161	25
cSH	1188	1700	463
Volume to Capacity	0.02	0.16	0.37
Queue Length 95th (ft)	2	0	43
Control Delay (s)	1.1	0.0	17.3
Lane LOS	A		C
Approach Delay (s)	1.1	0.0	17.3
Approach LOS			C

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	330	0	180	0	0	30	140	1660	30	0	1270	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	4.0			4.0	8.5	8.5			8.5	
Lane Util. Factor		1.00	1.00			1.00	1.00	0.95			0.95	
Frpb, ped/bikes		1.00	0.95			0.98	1.00	1.00			0.99	
Flpb, ped/bikes		0.99	1.00			1.00	0.99	1.00			1.00	
Frt		1.00	0.85			0.86	1.00	1.00			0.98	
Flt Protected		0.95	1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1754	1508			1579	1752	3530			3427	
Flt Permitted		0.95	1.00			1.00	0.18	1.00			1.00	
Satd. Flow (perm)		1754	1508			1579	333	3530			3427	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	0	180	0	0	30	140	1660	30	0	1270	190
RTOR Reduction (vph)	0	0	51	0	0	22	0	1	0	0	14	0
Lane Group Flow (vph)	0	330	129	0	0	8	140	1689	0	0	1446	0
Confl. Peds. (#/hr)	6		27	27		6	29					29
Turn Type	custom		custom			custom	Perm					
Protected Phases		2						10			7 10	
Permitted Phases	1		1			3	10					
Actuated Green, G (s)		13.7	18.2			18.5	31.8	31.8			54.3	
Effective Green, g (s)		13.7	18.2			18.5	31.8	31.8			54.3	
Actuated g/C Ratio		0.16	0.21			0.22	0.37	0.37			0.64	
Clearance Time (s)		8.5	4.0			4.0	8.5	8.5				
Vehicle Extension (s)		2.0	2.0			2.0	2.0	2.0				
Lane Grp Cap (vph)		283	323			344	125	1321			2189	
v/s Ratio Prot								c0.48			c0.42	
v/s Ratio Perm		0.19	0.09			0.01	0.42					
v/c Ratio		1.17	0.40			0.02	1.12	1.28			0.66	
Uniform Delay, d1		35.6	28.7			26.1	26.6	26.6			9.6	
Progression Factor		1.00	1.00			1.00	0.69	0.68			0.14	
Incremental Delay, d2		106.2	0.3			0.1	99.5	129.1			1.0	
Delay (s)		141.8	29.0			26.3	117.8	147.2			2.3	
Level of Service		F	C			C	F	F			A	
Approach Delay (s)		102.0			26.3			144.9			2.3	
Approach LOS		F			C			F			A	

Intersection Summary			
HCM Average Control Delay	83.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: 51st St. & Broadway

5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Volume (vph)	250	500	150	300	690	490	210	870	270	90	480	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			0.91			0.86	0.86
Frpb, ped/bikes	1.00	0.99		1.00	0.98			0.97			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.97		1.00	0.94			0.97			1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	0.98
Satd. Flow (prot)	1770	3375		1770	3252			4745			1522	4724
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.95	0.98
Satd. Flow (perm)	1770	3375		1770	3252			4745			1522	4724
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	250	500	150	300	690	490	210	870	270	90	480	530
RTOR Reduction (vph)	0	26	0	0	64	0	0	39	0	0	0	0
Lane Group Flow (vph)	250	624	0	300	1116	0	0	1311	0	0	287	813
Confl. Peds. (#/hr)	30		35	35		30	33		99		99	
Confl. Bikes (#/hr)			2			3			2			
Turn Type	Prot			Prot			Split			Split	Split	
Protected Phases	1	6		5	2		8	8		4	4	4
Permitted Phases												
Actuated Green, G (s)	15.0	28.5		15.0	28.5			27.5			23.0	23.0
Effective Green, g (s)	15.0	28.5		15.0	28.5			27.5			23.0	23.0
Actuated g/C Ratio	0.14	0.26		0.14	0.26			0.25			0.21	0.21
Clearance Time (s)	3.0	4.5		3.0	4.5			4.0			4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	241	874		241	843			1186			318	988
v/s Ratio Prot	0.14	0.18		c0.17	c0.34			c0.28			c0.19	0.17
v/s Ratio Perm												
v/c Ratio	1.04	0.71		1.24	1.32			1.11			0.90	0.82
Uniform Delay, d1	47.5	37.0		47.5	40.8			41.2			42.4	41.6
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	68.0	2.8		140.0	154.1			60.0			30.8	7.7
Delay (s)	115.5	39.8		187.5	194.9			101.3			73.2	49.3
Level of Service	F	D		F	F			F			E	D
Approach Delay (s)		60.9			193.4			101.3				52.4
Approach LOS		E			F			F				D

Intersection Summary			
HCM Average Control Delay	108.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	110.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Volume (vph)	220
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.5
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1469
Flt Permitted	1.00
Satd. Flow (perm)	1469
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	220
RTOR Reduction (vph)	174
Lane Group Flow (vph)	46
Confl. Peds. (#/hr)	33
Confl. Bikes (#/hr)	12
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	23.0
Effective Green, g (s)	23.0
Actuated g/C Ratio	0.21
Clearance Time (s)	4.5
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	307
v/s Ratio Prot	
v/s Ratio Perm	0.03
v/c Ratio	0.15
Uniform Delay, d1	35.5
Progression Factor	1.00
Incremental Delay, d2	1.0
Delay (s)	36.5
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL2	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	330	310	210	60	180	50	170	1020	70	60	1080	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95			0.95	
Frpb, ped/bikes	1.00	0.98			0.99		1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	
Frt	1.00	0.94			0.97		1.00	0.99			0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3252			3353		1769	3485			3380	
Flt Permitted	0.40	1.00			0.78		0.09	1.00			0.84	
Satd. Flow (perm)	738	3252			2658		166	3485			2844	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	310	210	60	180	50	170	1020	70	60	1080	270
RTOR Reduction (vph)	0	101	0	0	0	0	0	4	0	0	19	0
Lane Group Flow (vph)	330	419	0	0	290	0	170	1086	0	0	1391	0
Confl. Peds. (#/hr)			47	47		72	69		89	89		69
Confl. Bikes (#/hr)			6			9			11			12
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	7	4			8		1	6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	23.1	23.1			16.1		48.9	48.9			41.9	
Effective Green, g (s)	23.1	23.1			16.1		48.9	48.9			41.9	
Actuated g/C Ratio	0.29	0.29			0.20		0.61	0.61			0.52	
Clearance Time (s)	3.0	3.0			3.0		3.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	265	939			535		182	2130			1490	
v/s Ratio Prot	c0.06	0.13					c0.05	0.31				
v/s Ratio Perm	c0.30				0.11		c0.53				0.49	
v/c Ratio	1.25	0.45			0.54		0.93	0.51			0.93	
Uniform Delay, d1	28.6	23.2			28.6		14.2	8.8			17.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	138.0	0.3			1.1		47.7	0.9			12.1	
Delay (s)	166.5	23.6			29.8		61.9	9.7			29.8	
Level of Service	F	C			C		E	A			C	
Approach Delay (s)		79.1			29.8			16.7			29.8	
Approach LOS		E			C			B			C	

Intersection Summary			
HCM Average Control Delay	36.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	148.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SWR2
Lane Configurations	
Volume (vph)	70
Ideal Flow (vphpl)	1900
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.93
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	1492
Flt Permitted	1.00
Satd. Flow (perm)	1492
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	70
RTOR Reduction (vph)	33
Lane Group Flow (vph)	37
Confl. Peds. (#/hr)	72
Confl. Bikes (#/hr)	9
Turn Type	custom
Protected Phases	
Permitted Phases	2
Actuated Green, G (s)	41.9
Effective Green, g (s)	41.9
Actuated g/C Ratio	0.52
Clearance Time (s)	5.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	781
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.05
Uniform Delay, d1	9.3
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	9.4
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	380	170	100	600	340	230	950	110	230	880	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Lane Util. Factor		0.91			0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			0.97		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		0.99	1.00	
Frt		0.97			0.95		1.00	0.98		1.00	0.98	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		4782			4678		1752	3454		1753	3413	
Flt Permitted		0.68			0.76		0.19	1.00		0.18	1.00	
Satd. Flow (perm)		3282			3555		341	3454		328	3413	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	210	380	170	100	600	340	230	950	110	230	880	160
RTOR Reduction (vph)	0	62	0	0	21	0	0	10	0	0	18	0
Lane Group Flow (vph)	0	698	0	0	1019	0	230	1050	0	230	1022	0
Confl. Peds. (#/hr)	71		32	32		71	60		62	62		60
Confl. Bikes (#/hr)			2			5			41			44
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.2			28.2		36.3	36.3		36.3	36.3	
Effective Green, g (s)		28.2			28.2		36.3	36.3		36.3	36.3	
Actuated g/C Ratio		0.38			0.38		0.48	0.48		0.48	0.48	
Clearance Time (s)		5.5			5.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		1234			1337		165	1672		159	1652	
v/s Ratio Prot								0.30			0.30	
v/s Ratio Perm		0.21			c0.29		0.67			c0.70		
v/c Ratio		1.06dl			0.76		1.39	0.63		1.45	0.62	
Uniform Delay, d1		18.5			20.5		19.4	14.3		19.4	14.3	
Progression Factor		1.00			1.00		0.97	0.90		0.81	0.75	
Incremental Delay, d2		0.4			2.4		207.5	1.6		223.6	1.2	
Delay (s)		18.9			22.8		226.3	14.6		239.3	11.9	
Level of Service		B			C		F	B		F	B	
Approach Delay (s)		18.9			22.8			52.3			53.1	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	39.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: W MacArthur Blvd. & Broadway

5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	490	110	140	580	510	220	660	100	460	810	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.84	1.00	1.00	0.97	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1556	1770	3539	1336	1770	3539	1535	1770	3539	1458
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1556	1770	3539	1336	1770	3539	1535	1770	3539	1458
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	490	110	140	580	510	220	660	100	460	810	150
RTOR Reduction (vph)	0	0	81	0	0	377	0	0	75	0	0	68
Lane Group Flow (vph)	160	490	29	140	580	133	220	660	25	460	810	82
Confl. Peds. (#/hr)	108		3	3		108	63		3	3		63
Confl. Bikes (#/hr)			2			12			17	17		
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	31.3	31.3	9.0	31.3	31.3	17.3	29.7	29.7	32.0	44.4	44.4
Effective Green, g (s)	9.0	31.3	31.3	9.0	31.3	31.3	17.3	29.7	29.7	32.0	44.4	44.4
Actuated g/C Ratio	0.08	0.26	0.26	0.08	0.26	0.26	0.14	0.25	0.25	0.27	0.37	0.37
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	133	923	406	133	923	348	255	876	380	472	1309	539
v/s Ratio Prot	c0.09	0.14		c0.08	c0.16		c0.12	c0.19		c0.26	0.23	
v/s Ratio Perm			0.02			0.10			0.02			0.06
v/c Ratio	1.20	0.53	0.07	1.05	0.63	0.38	0.86	0.75	0.07	0.97	0.62	0.15
Uniform Delay, d1	55.5	38.1	33.4	55.5	39.2	36.4	50.2	41.8	34.5	43.6	30.9	25.2
Progression Factor	1.00	1.00	1.00	0.73	0.62	1.93	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	142.7	2.2	0.3	89.9	3.0	2.9	24.6	3.7	0.1	34.6	0.9	0.1
Delay (s)	198.2	40.2	33.7	130.5	27.2	73.3	74.8	45.5	34.6	78.2	31.8	25.4
Level of Service	F	D	C	F	C	E	E	D	C	E	C	C
Approach Delay (s)		72.5			58.1			50.9			46.1	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM Average Control Delay	55.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	880	50	180	780	300	60	240	340	290	110	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.96		1.00	1.00	0.80	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5038		1770	4673		1770	1863	1262	1770	1712	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5038		1770	4673		1770	1863	1262	1770	1712	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	880	50	180	780	300	60	240	340	290	110	110
RTOR Reduction (vph)	0	5	0	0	49	0	0	0	277	0	35	0
Lane Group Flow (vph)	110	925	0	180	1031	0	60	240	63	290	185	0
Confl. Peds. (#/hr)	50					50			101	101		
Confl. Bikes (#/hr)			3						2			2
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	11.7	42.8		15.2	46.3		6.7	22.3	22.3	22.7	38.3	
Effective Green, g (s)	11.7	42.8		15.2	46.3		6.7	22.3	22.3	22.7	38.3	
Actuated g/C Ratio	0.10	0.36		0.13	0.39		0.06	0.19	0.19	0.19	0.32	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	173	1797		224	1803		99	346	235	335	546	
v/s Ratio Prot	c0.06	0.18		c0.10	c0.22		0.03	c0.13		c0.16	0.11	
v/s Ratio Perm									0.05			
v/c Ratio	0.64	0.52		0.80	0.57		0.61	0.69	0.27	0.87	0.34	
Uniform Delay, d1	52.1	30.4		50.9	29.0		55.4	45.7	41.9	47.2	31.2	
Progression Factor	0.55	0.34		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.9	0.8		17.6	1.3		7.0	4.8	0.2	19.6	0.1	
Delay (s)	32.5	11.0		68.5	30.4		62.4	50.5	42.1	66.7	31.3	
Level of Service	C	B		E	C		E	D	D	E	C	
Approach Delay (s)		13.3			35.8			47.1			51.5	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM Average Control Delay	33.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	310	30	810	460	100	930
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		8.5	8.5	8.5	8.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00		1.00	0.91	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	0.99	1.00
Frt	0.99		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3398		3539	1442	1758	3539
Flt Permitted	0.96		1.00	1.00	0.33	1.00
Satd. Flow (perm)	3398		3539	1442	618	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	310	30	810	460	100	930
RTOR Reduction (vph)	10	0	0	210	0	0
Lane Group Flow (vph)	330	0	810	250	100	930
Confl. Peds. (#/hr)		11		15	15	
Confl. Bikes (#/hr)		15		49		
Turn Type				custom	Perm	
Protected Phases	8		2 10			10
Permitted Phases				2	10	
Actuated Green, G (s)	16.5		45.0	13.7	22.8	22.8
Effective Green, g (s)	16.5		45.0	13.7	22.8	22.8
Actuated g/C Ratio	0.22		0.60	0.18	0.30	0.30
Clearance Time (s)	5.0			8.5	8.5	8.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	748		2123	263	188	1076
v/s Ratio Prot	c0.10		0.23			c0.26
v/s Ratio Perm				c0.17	0.16	
v/c Ratio	0.44		0.38	0.95	0.53	0.86
Uniform Delay, d1	25.3		7.8	30.3	21.7	24.6
Progression Factor	1.00		0.06	1.61	1.00	1.00
Incremental Delay, d2	0.2		0.2	23.2	10.4	9.3
Delay (s)	25.4		0.7	72.1	32.0	33.9
Level of Service	C		A	E	C	C
Approach Delay (s)	25.4		26.6			33.7
Approach LOS	C		C			C

Intersection Summary			
HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: 30th St. & Broadway 5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	127	10	137	90	10	90	147	1053	90	110	1143	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		1.00	1.00		0.99	1.00	
Frt		0.93			0.94		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1659			1669		1765	3475		1755	3457	
Flt Permitted		0.77			0.75		0.14	1.00		0.18	1.00	
Satd. Flow (perm)		1312			1284		256	3475		333	3457	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	10	137	90	10	90	147	1053	90	110	1143	147
RTOR Reduction (vph)	0	44	0	0	44	0	0	8	0	0	13	0
Lane Group Flow (vph)	0	230	0	0	146	0	147	1135	0	110	1277	0
Confl. Peds. (#/hr)	19		25	25		19	23		53	53		23
Confl. Bikes (#/hr)									21			23
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		42.0	42.0		42.0	42.0	
Effective Green, g (s)		24.0			24.0		42.0	42.0		42.0	42.0	
Actuated g/C Ratio		0.32			0.32		0.56	0.56		0.56	0.56	
Clearance Time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		420			411		143	1946		186	1936	
v/s Ratio Prot								0.33			0.37	
v/s Ratio Perm		c0.18			0.11		c0.57			0.33		
v/c Ratio		0.55			0.36		1.03	0.58		0.59	0.66	
Uniform Delay, d1		21.0			19.6		16.5	10.8		10.9	11.5	
Progression Factor		1.00			1.00		0.61	0.46		1.20	1.22	
Incremental Delay, d2		5.1			2.4		78.3	1.1		11.8	1.6	
Delay (s)		26.1			22.0		88.4	6.1		24.8	15.6	
Level of Service		C			C		F	A		C	B	
Approach Delay (s)		26.1			22.0			15.5			16.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	80	60	130	70	130	90	920	130	150	990	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.98			0.97		1.00	0.97		1.00	1.00	
Flpb, ped/bikes		0.99			0.98		0.99	1.00		0.97	1.00	
Frt		0.96			0.95		1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1703			1648		1757	3381		1711	3498	
Flt Permitted		0.85			0.78		0.21	1.00		0.21	1.00	
Satd. Flow (perm)		1468			1313		387	3381		371	3498	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	80	60	130	70	130	90	920	130	150	990	50
RTOR Reduction (vph)	0	22	0	0	31	0	0	15	0	0	5	0
Lane Group Flow (vph)	0	168	0	0	299	0	90	1035	0	150	1035	0
Confl. Peds. (#/hr)	61		67	67		61	38		177	177		38
Confl. Bikes (#/hr)			8			15			63			63
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		24.0			24.0		41.0	41.0		41.0	41.0	
Effective Green, g (s)		24.0			24.0		41.0	41.0		41.0	41.0	
Actuated g/C Ratio		0.32			0.32		0.55	0.55		0.55	0.55	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		470			420		212	1848		203	1912	
v/s Ratio Prot								0.31			0.30	
v/s Ratio Perm		0.11			c0.23		0.23			c0.40		
v/c Ratio		0.36			0.71		0.42	0.56		0.74	0.54	
Uniform Delay, d1		19.6			22.4		10.0	11.1		12.9	10.9	
Progression Factor		1.00			1.00		0.98	1.00		0.67	0.73	
Incremental Delay, d2		2.1			9.8		5.3	1.1		16.8	0.8	
Delay (s)		21.7			32.3		15.1	12.2		25.5	8.8	
Level of Service		C			C		B	B		C	A	
Approach Delay (s)		21.7			32.3			12.4			10.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	390	180	50	460	190	230	700	50	140	710	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.95		1.00	0.96		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3342		1770	3338		1750	3487		1745	3314	
Flt Permitted	0.95	1.00		0.95	1.00		0.18	1.00		0.28	1.00	
Satd. Flow (perm)	1770	3342		1770	3338		323	3487		510	3314	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	180	390	180	50	460	190	230	700	50	140	710	270
RTOR Reduction (vph)	0	68	0	0	62	0	0	7	0	0	50	0
Lane Group Flow (vph)	180	502	0	50	588	0	230	743	0	140	930	0
Confl. Peds. (#/hr)	20		11	11		20	68		56	56		68
Confl. Bikes (#/hr)			8			18			33			36
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.8	25.8		4.6	20.6		31.1	31.1		31.1	31.1	
Effective Green, g (s)	10.3	25.3		5.1	20.1		32.6	32.6		32.6	32.6	
Actuated g/C Ratio	0.14	0.34		0.07	0.27		0.43	0.43		0.43	0.43	
Clearance Time (s)	4.5	3.5		4.5	3.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	243	1127		120	895		140	1516		222	1440	
v/s Ratio Prot	c0.10	0.15		0.03	c0.18			0.21			0.28	
v/s Ratio Perm							c0.71			0.27		
v/c Ratio	0.74	0.45		0.42	0.66		1.64	0.49		0.63	0.65	
Uniform Delay, d1	31.1	19.4		33.5	24.4		21.2	15.2		16.5	16.7	
Progression Factor	1.00	1.00		1.04	0.72		0.96	0.91		1.16	1.11	
Incremental Delay, d2	10.1	0.1		0.7	1.2		314.6	1.0		12.2	2.1	
Delay (s)	41.2	19.5		35.5	18.7		334.9	14.8		31.3	20.6	
Level of Service	D	B		D	B		F	B		C	C	
Approach Delay (s)		24.7			19.9			89.9			21.9	
Approach LOS		C			B			F			C	

Intersection Summary			
HCM Average Control Delay	40.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	350	80	40	360	400	130	790	30	300	930	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99			1.00	0.92	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.98	1.00			1.00	1.00	0.99	1.00		0.99	1.00	
Frt	1.00	0.97			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1727	3418			3520	1452	1757	3510		1747	3414	
Flt Permitted	0.49	1.00			0.88	1.00	0.15	1.00		0.26	1.00	
Satd. Flow (perm)	892	3418			3116	1452	268	3510		470	3414	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	350	80	40	360	400	130	790	30	300	930	170
RTOR Reduction (vph)	0	26	0	0	0	42	0	4	0	0	20	0
Lane Group Flow (vph)	160	404	0	0	400	358	130	816	0	300	1080	0
Confl. Peds. (#/hr)	57		15	15		57	63		67	67		63
Confl. Bikes (#/hr)			25			61			48			61
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		3			4			1			1	
Permitted Phases	3			4		4	1			1		
Actuated Green, G (s)	31.0	31.0			31.0	31.0	33.0	33.0		33.0	33.0	
Effective Green, g (s)	32.5	32.5			32.5	32.5	34.5	34.5		34.5	34.5	
Actuated g/C Ratio	0.43	0.43			0.43	0.43	0.46	0.46		0.46	0.46	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		5.5	5.5	
Lane Grp Cap (vph)	387	1481			1350	629	123	1615		216	1570	
v/s Ratio Prot		0.12						0.23			0.32	
v/s Ratio Perm	0.18				0.13	c0.25	0.48			c0.64		
v/c Ratio	0.41	0.27			0.30	0.57	1.06	0.51		1.39	0.69	
Uniform Delay, d1	14.7	13.7			13.8	16.0	20.2	14.2		20.2	16.0	
Progression Factor	1.36	1.33			1.00	1.00	1.47	1.49		1.10	1.09	
Incremental Delay, d2	2.9	0.4			0.6	3.7	93.2	1.0		198.6	2.2	
Delay (s)	22.8	18.6			14.4	19.7	123.0	22.2		220.8	19.7	
Level of Service	C	B			B	B	F	C		F	B	
Approach Delay (s)		19.7			17.0			36.0			62.8	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM Average Control Delay	39.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	200	450	140	70	90	20	400	350	30	260	620	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00			1.00	1.00	1.00		0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.35			1.00	1.00	0.64		1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85			1.00	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	561			1770	1863	1019		3433	3372	
Flt Permitted	0.95	1.00	1.00			0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	561			1770	1863	1019		3433	3372	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	450	140	70	90	20	400	350	30	260	620	110
RTOR Reduction (vph)	0	0	11	0	0	0	0	206	0	0	9	0
Lane Group Flow (vph)	200	450	199	0	0	110	400	144	0	290	721	0
Confl. Peds. (#/hr)			72	72				175				86
Confl. Bikes (#/hr)			42	42				72				13
Turn Type	Prot		Perm		Prot	Prot		Perm	Prot	Prot		
Protected Phases	10	4			3	3	8		5	5	2	
Permitted Phases			4					8				
Actuated Green, G (s)	25.5	20.0	20.0			10.0	35.0	35.0		15.0	58.0	
Effective Green, g (s)	25.5	20.0	20.0			10.0	35.0	35.0		15.0	58.0	
Actuated g/C Ratio	0.16	0.12	0.12			0.06	0.22	0.22		0.09	0.36	
Clearance Time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0			3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	282	442	70			111	408	223		322	1222	
v/s Ratio Prot	c0.11	0.13				0.06	c0.21			0.08	c0.21	
v/s Ratio Perm			c0.35					0.14				
v/c Ratio	0.71	1.02	2.84			0.99	0.98	0.64		0.90	0.59	
Uniform Delay, d1	63.7	70.0	70.0			75.0	62.2	56.8		71.8	41.4	
Progression Factor	1.00	1.00	1.00			1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.9	47.5	864.8			82.4	39.2	6.3		26.7	2.1	
Delay (s)	71.7	117.5	934.8			157.3	101.4	63.1		98.4	43.5	
Level of Service	E	F	F			F	F	E		F	D	
Approach Delay (s)		306.4					93.0				59.1	
Approach LOS		F					F				E	

Intersection Summary			
HCM Average Control Delay	127.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	270	550	50	120
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		
Lane Util. Factor	1.00	0.95		
Frpb, ped/bikes	1.00	0.93		
Flpb, ped/bikes	1.00	1.00		
Frt	1.00	0.96		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3172		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3172		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00
Adj. Flow (vph)	270	550	50	120
RTOR Reduction (vph)	0	10	0	0
Lane Group Flow (vph)	270	710	0	0
Confl. Peds. (#/hr)			87	87
Confl. Bikes (#/hr)			11	11
Turn Type	Prot			
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	21.5	64.5		
Effective Green, g (s)	21.5	64.5		
Actuated g/C Ratio	0.13	0.40		
Clearance Time (s)	5.0	5.0		
Vehicle Extension (s)	3.0	3.0		
Lane Grp Cap (vph)	238	1279		
v/s Ratio Prot	c0.15	0.22		
v/s Ratio Perm				
v/c Ratio	1.13	0.56		
Uniform Delay, d1	69.2	36.7		
Progression Factor	1.00	1.00		
Incremental Delay, d2	99.4	1.7		
Delay (s)	168.6	38.5		
Level of Service	F	D		
Approach Delay (s)		74.0		
Approach LOS		E		

Intersection Summary

HCM Signalized Intersection Capacity Analysis
12: Grand Ave. & Broadway

5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	690	100	120	560	100	140	660	200	110	690	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98			0.98		1.00	1.00	0.87	1.00	0.97	
Flpb, ped/bikes	0.97	1.00			0.99		0.97	1.00	1.00	0.96	1.00	
Frt	1.00	0.98			0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1717	3398			3368		1718	3539	1374	1696	3328	
Flt Permitted	0.26	1.00			0.65		0.24	1.00	1.00	0.34	1.00	
Satd. Flow (perm)	464	3398			2213		434	3539	1374	609	3328	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	190	690	100	120	560	100	140	660	200	110	690	180
RTOR Reduction (vph)	0	16	0	0	17	0	0	0	24	0	31	0
Lane Group Flow (vph)	190	774	0	0	763	0	140	660	176	110	839	0
Confl. Peds. (#/hr)	125		182	182		125	141		139	139		141
Confl. Bikes (#/hr)			23			23			19			44
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	30.0	30.0			30.0		34.0	34.0	34.0	34.0	34.0	
Effective Green, g (s)	30.0	30.0			30.0		34.0	34.0	34.0	34.0	34.0	
Actuated g/C Ratio	0.42	0.42			0.42		0.47	0.47	0.47	0.47	0.47	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	193	1416			922		205	1671	649	288	1572	
v/s Ratio Prot		0.23						0.19			0.25	
v/s Ratio Perm	c0.41				0.34		c0.32		0.13	0.18		
v/c Ratio	0.98	0.55			0.83		0.68	0.39	0.27	0.38	0.53	
Uniform Delay, d1	20.8	15.9			18.7		14.8	12.3	11.5	12.2	13.4	
Progression Factor	1.00	1.00			1.21		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	59.7	0.2			5.3		16.9	0.7	1.0	3.8	1.3	
Delay (s)	80.5	16.1			27.8		31.7	13.0	12.5	16.0	14.7	
Level of Service	F	B			C		C	B	B	B	B	
Approach Delay (s)		28.6			27.8			15.5			14.9	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	21.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	34	106	122	182	168	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	34	106	122	182	168	32
Pedestrians		50	50		50	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		4	4		4	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			113			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	354				487	313
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	314				451	271
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				66	95
cM capacity (veh/h)	1154				487	681

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	140	304	200
Volume Left	34	0	168
Volume Right	0	182	32
cSH	1154	1700	510
Volume to Capacity	0.03	0.18	0.39
Queue Length 95th (ft)	2	0	46
Control Delay (s)	2.2	0.0	16.5
Lane LOS	A		C
Approach Delay (s)	2.2	0.0	16.5
Approach LOS			C

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	0	130	0	0	30	150	1060	30	0	1030	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	4.0			4.0	8.5	8.5			8.5	
Lane Util. Factor		1.00	1.00			1.00	1.00	0.95			0.95	
Frpb, ped/bikes		1.00	0.97			0.99	1.00	1.00			0.98	
Flpb, ped/bikes		1.00	1.00			1.00	0.99	1.00			1.00	
Frt		1.00	0.85			0.86	1.00	1.00			0.98	
Flt Protected		0.95	1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1765	1541			1588	1746	3509			3381	
Flt Permitted		0.95	1.00			1.00	0.23	1.00			1.00	
Satd. Flow (perm)		1765	1541			1588	418	3509			3381	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	0	130	0	0	30	150	1060	30	0	1030	200
RTOR Reduction (vph)	0	0	67	0	0	23	0	3	0	0	21	0
Lane Group Flow (vph)	0	200	63	0	0	7	150	1087	0	0	1209	0
Confl. Peds. (#/hr)	2		11	11		2	32		34	34		32
Confl. Bikes (#/hr)			2						59			61
Turn Type	custom		custom			custom	Perm					
Protected Phases		2						10			7 10	
Permitted Phases	1		1			3	10					
Actuated Green, G (s)		13.7	18.2			17.5	22.8	22.8			44.3	
Effective Green, g (s)		13.7	18.2			17.5	22.8	22.8			44.3	
Actuated g/C Ratio		0.18	0.24			0.23	0.30	0.30			0.59	
Clearance Time (s)		8.5	4.0			4.0	8.5	8.5				
Vehicle Extension (s)		2.0	2.0			2.0	2.0	2.0				
Lane Grp Cap (vph)		322	374			371	127	1067			1997	
v/s Ratio Prot								0.31			c0.36	
v/s Ratio Perm		0.11	0.04			0.00	c0.36					
v/c Ratio		0.62	0.17			0.02	1.18	1.02			0.61	
Uniform Delay, d1		28.3	22.4			22.1	26.1	26.1			9.8	
Progression Factor		1.00	1.00			1.00	0.65	0.63			0.36	
Incremental Delay, d2		8.7	0.1			0.1	129.5	29.9			0.9	
Delay (s)		37.0	22.5			22.2	146.5	46.4			4.4	
Level of Service		D	C			C	F	D			A	
Approach Delay (s)		31.3			22.2			58.5			4.4	
Approach LOS		C			C			E			A	

Intersection Summary			
HCM Average Control Delay	31.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	430	120	1410	610	150	1030
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		8.5	8.5	8.5	8.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frpb, ped/bikes	0.98		1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.97		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3308		3539	1560	1770	3539
Flt Permitted	0.96		1.00	1.00	0.13	1.00
Satd. Flow (perm)	3308		3539	1560	244	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	430	120	1410	610	150	1030
RTOR Reduction (vph)	31	0	0	139	0	0
Lane Group Flow (vph)	519	0	1410	471	150	1030
Confl. Peds. (#/hr)		44		2		
Turn Type				custom	Perm	
Protected Phases	8		2 10			10
Permitted Phases				2	10	
Actuated Green, G (s)	18.0		53.5	14.5	30.5	30.5
Effective Green, g (s)	18.0		53.5	14.5	30.5	30.5
Actuated g/C Ratio	0.21		0.63	0.17	0.36	0.36
Clearance Time (s)	5.0			8.5	8.5	8.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	701		2227	266	88	1270
v/s Ratio Prot	c0.16		0.40			0.29
v/s Ratio Perm				c0.30	c0.61	
v/c Ratio	0.74		0.63	1.77	1.70	0.81
Uniform Delay, d1	31.3		9.7	35.2	27.2	24.6
Progression Factor	1.00		0.13	1.08	1.00	1.00
Incremental Delay, d2	3.7		0.1	347.6	360.6	5.7
Delay (s)	35.0		1.4	385.5	387.8	30.3
Level of Service	D		A	F	F	C
Approach Delay (s)	35.0		117.4			75.8
Approach LOS	D		F			E

Intersection Summary			
HCM Average Control Delay	92.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: 27th St. & Broadway

5/31/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	970	110	50	780	480	220	1110	90	400	860	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		2.5	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00	0.91	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00			1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	0.98			1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1748	3472			3528	1437	1745	3467		1770	3387	
Flt Permitted	0.21	1.00			0.69	1.00	0.16	1.00		0.95	1.00	
Satd. Flow (perm)	385	3472			2449	1437	299	3467		1770	3387	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	970	110	50	780	480	220	1110	90	400	860	180
RTOR Reduction (vph)	0	10	0	0	0	88	0	7	0	0	21	0
Lane Group Flow (vph)	200	1070	0	0	830	392	220	1193	0	400	1019	0
Confl. Peds. (#/hr)	57		23	23		57	95		93	93		95
Confl. Bikes (#/hr)			13			63			70			46
Turn Type	Perm			Perm		Perm	Perm			Prot		
Protected Phases		4			8			6		5	2	
Permitted Phases	4			8		8	6					
Actuated Green, G (s)	31.5	31.5			31.5	31.5	32.5	32.5		6.0	42.5	
Effective Green, g (s)	33.0	33.0			33.0	33.0	34.0	34.0		7.5	44.0	
Actuated g/C Ratio	0.39	0.39			0.39	0.39	0.40	0.40		0.09	0.52	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	149	1348			951	558	120	1387		156	1753	
v/s Ratio Prot		0.31						0.34		c0.23	0.30	
v/s Ratio Perm	c0.52				0.34	0.27	c0.74					
v/c Ratio	1.34	0.79			0.87	0.70	1.83	0.86		2.56	0.58	
Uniform Delay, d1	26.0	23.0			24.1	21.9	25.5	23.3		38.8	14.1	
Progression Factor	0.85	0.83			1.00	1.00	0.50	0.50		0.89	1.03	
Incremental Delay, d2	158.2	0.3			8.6	3.3	397.8	5.4		717.7	1.1	
Delay (s)	180.2	19.5			32.7	25.1	410.6	17.1		752.3	15.6	
Level of Service	F	B			C	C	F	B		F	B	
Approach Delay (s)		44.6			29.9			78.1			220.2	
Approach LOS		D			C			E			F	

Intersection Summary			
HCM Average Control Delay	96.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.69		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	124.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	440	610	400	130	90	320	180	790	1570	110	200	800
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	1.00	0.97	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.76		1.00	1.00	0.89	1.00	0.98		1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.99		1.00	0.97
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	3433	1863	1202		1770	1863	1406	3433	3442		1770	3231
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	3433	1863	1202		1770	1863	1406	3433	3442		1770	3231
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	440	610	400	130	90	320	180	790	1570	110	200	800
RTOR Reduction (vph)	0	0	10	0	0	0	129	0	4	0	0	17
Lane Group Flow (vph)	440	610	520	0	90	320	51	790	1676	0	200	973
Confl. Peds. (#/hr)			95				70			101		
Confl. Bikes (#/hr)			4	4			2			4		
Turn Type	Prot		Perm		Prot		Perm	Prot			Prot	
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases			2				6					
Actuated Green, G (s)	16.8	46.0	46.0		5.0	34.2	34.2	15.0	39.0		10.0	34.0
Effective Green, g (s)	16.8	46.0	46.0		5.0	34.2	34.2	15.0	39.0		10.0	34.0
Actuated g/C Ratio	0.14	0.38	0.38		0.04	0.29	0.29	0.12	0.32		0.08	0.28
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	481	714	461		74	531	401	429	1119		148	915
v/s Ratio Prot	0.13	0.33			c0.05	0.17		c0.23	c0.49		0.11	0.30
v/s Ratio Perm			c0.43				0.04					
v/c Ratio	0.91	0.85	1.13		1.22	0.60	0.13	1.84	1.50		1.35	1.06
Uniform Delay, d1	50.9	33.9	37.0		57.5	37.0	31.8	52.5	40.5		55.0	43.0
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	21.5	12.4	81.9		173.9	5.0	0.7	387.6	228.7		195.9	48.0
Delay (s)	72.4	46.4	118.9		231.4	42.0	32.5	440.1	269.2		250.9	91.0
Level of Service	E	D	F		F	D	C	F	F		F	F
Approach Delay (s)		78.0				68.0			323.9			117.9
Approach LOS		E				E			F			F

Intersection Summary			
HCM Average Control Delay	189.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	112.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2
Lane Configurations	
Volume (vph)	190
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	190
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	232
Confl. Bikes (#/hr)	23
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	1180	100	100	810	120	450	1130	280	150	630	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98			1.00		1.00	1.00	0.90	1.00	0.97	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	0.99			0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1765	3439			3441		1763	3539	1423	1749	3331	
Flt Permitted	0.16	1.00			0.56		0.17	1.00	1.00	0.18	1.00	
Satd. Flow (perm)	296	3439			1947		321	3539	1423	324	3331	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	180	1180	100	100	810	120	450	1130	280	150	630	160
RTOR Reduction (vph)	0	7	0	0	12	0	0	0	4	0	26	0
Lane Group Flow (vph)	180	1273	0	0	1018	0	450	1130	276	150	764	0
Confl. Peds. (#/hr)	15		228	228		15	148		70	70		148
Confl. Bikes (#/hr)			15			10			51			11
Turn Type	Perm			Perm			pm+pt		Perm	Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	38.0	38.0			38.0		39.0	39.0	39.0	29.0	29.0	
Effective Green, g (s)	38.0	38.0			38.0		39.0	39.0	39.0	29.0	29.0	
Actuated g/C Ratio	0.45	0.45			0.45		0.46	0.46	0.46	0.34	0.34	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		3.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	132	1537			870		249	1624	653	111	1136	
v/s Ratio Prot		0.37					c0.13	0.32			0.23	
v/s Ratio Perm	c0.61				0.52		c0.70		0.19	0.46		
v/c Ratio	1.36	0.83			1.17		1.81	0.70	0.42	1.35	0.67	
Uniform Delay, d1	23.5	20.6			23.5		20.5	18.3	15.4	28.0	23.9	
Progression Factor	1.05	1.05			1.67		1.00	1.00	1.00	1.08	1.08	
Incremental Delay, d2	182.4	1.5			87.2		378.8	2.5	2.0	205.6	3.2	
Delay (s)	207.0	23.1			126.5		399.2	20.8	17.4	235.9	29.1	
Level of Service	F	C			F		F	C	B	F	C	
Approach Delay (s)		45.8			126.5			111.8			62.1	
Approach LOS		D			F			F			E	

Intersection Summary			
HCM Average Control Delay	87.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.56		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	128.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	330	0	180	0	0	30	140	1660	30	0	1270	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	4.0			4.0	8.5	8.5			8.5	
Lane Util. Factor		1.00	1.00			1.00	1.00	0.95			0.95	
Frpb, ped/bikes		1.00	0.95			0.98	1.00	1.00			0.99	
Flpb, ped/bikes		0.99	1.00			1.00	0.99	1.00			1.00	
Frt		1.00	0.85			0.86	1.00	1.00			0.98	
Flt Protected		0.95	1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1754	1508			1579	1752	3530			3427	
Flt Permitted		0.95	1.00			1.00	0.18	1.00			1.00	
Satd. Flow (perm)		1754	1508			1579	333	3530			3427	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	330	0	180	0	0	30	140	1660	30	0	1270	190
RTOR Reduction (vph)	0	0	50	0	0	22	0	1	0	0	14	0
Lane Group Flow (vph)	0	330	130	0	0	8	140	1689	0	0	1446	0
Confl. Peds. (#/hr)	6		27	27		6	29					29
Turn Type	custom		custom			custom	Perm					
Protected Phases		2						10			7 10	
Permitted Phases	1		1			3	10					
Actuated Green, G (s)		14.5	19.0			19.0	30.5	30.5			53.5	
Effective Green, g (s)		14.5	19.0			19.0	30.5	30.5			53.5	
Actuated g/C Ratio		0.17	0.22			0.22	0.36	0.36			0.63	
Clearance Time (s)		8.5	4.0			4.0	8.5	8.5				
Vehicle Extension (s)		2.0	2.0			2.0	2.0	2.0				
Lane Grp Cap (vph)		299	337			353	119	1267			2157	
v/s Ratio Prot								c0.48			c0.42	
v/s Ratio Perm		0.19	0.09			0.01	0.42					
v/c Ratio		1.10	0.38			0.02	1.18	1.33			0.67	
Uniform Delay, d1		35.2	28.0			25.8	27.2	27.2			10.1	
Progression Factor		1.00	1.00			1.00	0.74	0.72			0.15	
Incremental Delay, d2		82.8	0.3			0.1	120.7	153.2			1.0	
Delay (s)		118.0	28.3			25.9	141.0	172.9			2.5	
Level of Service		F	C			C	F	F			A	
Approach Delay (s)		86.4			25.9			170.4			2.5	
Approach LOS		F			C			F			A	

Intersection Summary			
HCM Average Control Delay	94.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	310	30	810	460	100	930
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		8.5	8.5	8.5	8.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00		1.00	0.91	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	0.99	1.00
Frt	0.99		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3398		3539	1442	1758	3539
Flt Permitted	0.96		1.00	1.00	0.33	1.00
Satd. Flow (perm)	3398		3539	1442	618	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	310	30	810	460	100	930
RTOR Reduction (vph)	10	0	0	210	0	0
Lane Group Flow (vph)	330	0	810	250	100	930
Confl. Peds. (#/hr)		11		15	15	
Confl. Bikes (#/hr)		15		49		
Turn Type				custom	Perm	
Protected Phases	8		2 10			10
Permitted Phases				2	10	
Actuated Green, G (s)	16.5		45.0	13.7	22.8	22.8
Effective Green, g (s)	16.5		45.0	13.7	22.8	22.8
Actuated g/C Ratio	0.22		0.60	0.18	0.30	0.30
Clearance Time (s)	5.0			8.5	8.5	8.5
Vehicle Extension (s)	2.0			2.0	2.0	2.0
Lane Grp Cap (vph)	748		2123	263	188	1076
v/s Ratio Prot	c0.10		0.23			c0.26
v/s Ratio Perm				c0.17	0.16	
v/c Ratio	0.44		0.38	0.95	0.53	0.86
Uniform Delay, d1	25.3		7.8	30.3	21.7	24.6
Progression Factor	1.00		0.06	1.61	1.00	1.00
Incremental Delay, d2	0.2		0.2	23.2	10.4	9.3
Delay (s)	25.4		0.7	72.1	32.0	33.9
Level of Service	C		A	E	C	C
Approach Delay (s)	25.4		26.5			33.7
Approach LOS	C		C			C

Intersection Summary			
HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	350	80	40	360	400	130	790	30	300	930	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		2.5	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99			1.00	0.90	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.98	1.00			1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	0.97			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1727	3414			3519	1430	1753	3509		1770	3416	
Flt Permitted	0.45	1.00			0.87	1.00	0.26	1.00		0.95	1.00	
Satd. Flow (perm)	810	3414			3094	1430	479	3509		1770	3416	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	350	80	40	360	400	130	790	30	300	930	170
RTOR Reduction (vph)	0	26	0	0	0	210	0	3	0	0	15	0
Lane Group Flow (vph)	160	404	0	0	400	190	130	817	0	300	1085	0
Confl. Peds. (#/hr)	57		15	15		57	63		67	67		63
Confl. Bikes (#/hr)			25			61			48			61
Turn Type	Perm			Perm		Perm	Perm			Prot		
Protected Phases		4			8			6		5	2	
Permitted Phases	4			8		8	6					
Actuated Green, G (s)	21.7	21.7			21.7	21.7	30.5	30.5		10.2	44.7	
Effective Green, g (s)	23.2	23.2			23.2	23.2	32.0	32.0		11.7	46.2	
Actuated g/C Ratio	0.30	0.30			0.30	0.30	0.41	0.41		0.15	0.60	
Clearance Time (s)	5.5	5.5			5.5	5.5	5.5	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	243	1023			927	429	198	1451		268	2039	
v/s Ratio Prot		0.12						0.23		c0.17	0.32	
v/s Ratio Perm	c0.20				0.13	0.13	c0.27					
v/c Ratio	0.66	0.40			0.43	0.44	0.66	0.56		1.12	0.53	
Uniform Delay, d1	23.6	21.5			21.8	21.9	18.3	17.4		32.9	9.2	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.8	0.1			0.1	0.3	15.8	1.6		90.9	1.0	
Delay (s)	28.5	21.6			21.9	22.1	34.0	18.9		123.8	10.2	
Level of Service	C	C			C	C	C	B		F	B	
Approach Delay (s)		23.5			22.0			21.0			34.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	77.4	Sum of lost time (s)	10.5
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	EBR2	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	200	450	60	70	90	420	350	260	620	110	270	550
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00	1.00	0.97	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.59		1.00	1.00	0.71	1.00	0.96		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85		1.00	1.00	0.85	1.00	0.98		1.00	0.96
Flt Protected	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	3433	1863	937		1770	1863	1127	3433	3332		1770	3311
Flt Permitted	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	3433	1863	937		1770	1863	1127	3433	3332		1770	3311
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	450	60	70	90	420	350	260	620	110	270	550
RTOR Reduction (vph)	0	0	35	0	0	0	218	0	12	0	0	24
Lane Group Flow (vph)	200	450	95	0	90	420	132	260	718	0	270	696
Confl. Peds. (#/hr)			72	72			175			86		
Confl. Bikes (#/hr)			42	42			72			13		
Turn Type	Prot		Perm		Prot		Perm	Prot			Prot	
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases			2				6					
Actuated Green, G (s)	12.3	40.0	40.0		10.0	37.7	37.7	13.9	33.5		16.5	36.1
Effective Green, g (s)	12.3	40.0	40.0		10.0	37.7	37.7	13.9	33.5		16.5	36.1
Actuated g/C Ratio	0.10	0.33	0.33		0.08	0.31	0.31	0.12	0.28		0.14	0.30
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	352	621	312		148	585	354	398	930		243	996
v/s Ratio Prot	0.06	c0.24			0.05	c0.23		0.08	c0.22		c0.15	c0.21
v/s Ratio Perm			0.10				0.12					
v/c Ratio	0.57	0.72	0.31		0.61	0.72	0.37	0.65	0.77		1.11	0.70
Uniform Delay, d1	51.3	35.2	29.7		53.1	36.4	32.0	50.7	39.7		51.8	37.1
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	7.2	2.5		6.9	7.4	3.0	3.8	6.2		90.8	4.1
Delay (s)	53.4	42.4	32.2		60.0	43.8	35.0	54.6	45.9		142.5	41.2
Level of Service	D	D	C		E	D	C	D	D		F	D
Approach Delay (s)		43.5				41.9			48.2			68.8
Approach LOS		D				D			D			E

Intersection Summary			
HCM Average Control Delay	51.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR2
Lane Configurations	
Volume (vph)	170
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	1.00
Adj. Flow (vph)	170
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	87
Confl. Bikes (#/hr)	11
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	690	100	120	560	100	140	660	200	110	690	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.98			0.98		1.00	1.00	0.87	1.00	0.97	
Flpb, ped/bikes	0.97	1.00			0.99		1.00	1.00	1.00	0.95	1.00	
Frt	1.00	0.98			0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1717	3398			3368		1765	3539	1374	1688	3324	
Flt Permitted	0.26	1.00			0.65		0.16	1.00	1.00	0.40	1.00	
Satd. Flow (perm)	464	3398			2213		289	3539	1374	712	3324	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	190	690	100	120	560	100	140	660	200	110	690	180
RTOR Reduction (vph)	0	16	0	0	16	0	0	0	19	0	33	0
Lane Group Flow (vph)	190	774	0	0	764	0	140	660	181	110	837	0
Confl. Peds. (#/hr)	125		182	182		125	141		139	139		141
Confl. Bikes (#/hr)			23			23			19			44
Turn Type	Perm			Perm			pm+pt		Perm	Perm		
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	30.0	30.0			30.0		34.0	34.0	34.0	26.0	26.0	
Effective Green, g (s)	30.0	30.0			30.0		34.0	34.0	34.0	26.0	26.0	
Actuated g/C Ratio	0.42	0.42			0.42		0.47	0.47	0.47	0.36	0.36	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		3.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	193	1416			922		218	1671	649	257	1200	
v/s Ratio Prot		0.23					c0.04	0.19			0.25	
v/s Ratio Perm	c0.41				0.35		c0.27		0.13	0.15		
v/c Ratio	0.98	0.55			0.83		0.64	0.39	0.28	0.43	0.70	
Uniform Delay, d1	20.8	15.9			18.7		13.1	12.3	11.5	17.4	19.6	
Progression Factor	1.00	1.00			1.18		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	59.7	0.2			5.3		6.3	0.7	1.1	5.1	3.4	
Delay (s)	80.5	16.1			27.3		19.4	13.0	12.6	22.5	23.0	
Level of Service	F	B			C		B	B	B	C	C	
Approach Delay (s)		28.6			27.3			13.8			23.0	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	0	130	0	0	30	150	1060	30	0	1030	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		8.5	4.0			4.0	8.5	8.5			8.5	
Lane Util. Factor		1.00	1.00			1.00	1.00	0.95			0.95	
Frpb, ped/bikes		1.00	0.97			0.99	1.00	1.00			0.98	
Flpb, ped/bikes		1.00	1.00			1.00	0.99	1.00			1.00	
Frt		1.00	0.85			0.86	1.00	1.00			0.98	
Flt Protected		0.95	1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)		1765	1541			1588	1746	3509			3381	
Flt Permitted		0.95	1.00			1.00	0.23	1.00			1.00	
Satd. Flow (perm)		1765	1541			1588	418	3509			3381	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	0	130	0	0	30	150	1060	30	0	1030	200
RTOR Reduction (vph)	0	0	67	0	0	23	0	3	0	0	21	0
Lane Group Flow (vph)	0	200	63	0	0	7	150	1087	0	0	1209	0
Confl. Peds. (#/hr)	2		11	11		2	32		34	34		32
Confl. Bikes (#/hr)			2						59			61
Turn Type	custom		custom			custom	Perm					
Protected Phases		2						10			7 10	
Permitted Phases	1		1			3	10					
Actuated Green, G (s)		13.7	18.2			17.5	22.8	22.8			44.3	
Effective Green, g (s)		13.7	18.2			17.5	22.8	22.8			44.3	
Actuated g/C Ratio		0.18	0.24			0.23	0.30	0.30			0.59	
Clearance Time (s)		8.5	4.0			4.0	8.5	8.5				
Vehicle Extension (s)		2.0	2.0			2.0	2.0	2.0				
Lane Grp Cap (vph)		322	374			371	127	1067			1997	
v/s Ratio Prot								0.31			c0.36	
v/s Ratio Perm		0.11	0.04			0.00	c0.36					
v/c Ratio		0.62	0.17			0.02	1.18	1.02			0.61	
Uniform Delay, d1		28.3	22.4			22.1	26.1	26.1			9.8	
Progression Factor		1.00	1.00			1.00	0.68	0.67			0.36	
Incremental Delay, d2		8.7	0.1			0.1	129.5	29.9			0.9	
Delay (s)		37.0	22.5			22.2	147.3	47.4			4.4	
Level of Service		D	C			C	F	D			A	
Approach Delay (s)		31.3			22.2			59.5			4.4	
Approach LOS		C			C			E			A	

Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Appendix B7

CMP Analysis Calculations

FEHR PEERS

Shops at Broadway DEIR
MTS Roadway System Analysis Summary - 2020 PM

Link Location	Segment Limits		No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Freeway Segments										
I-980 Eastbound										
Between	I-880	12th Street	3,429	3,434	0.86	0.86	D	D	No	-
Between	12th Street	27th Street	4,325	4,325	0.72	0.72	C	C	No	-
Between	27th Street	I-580	6,073	6,084	0.61	0.61	C	C	No	-
I-980 Westbound										
Between	I-580	27th Street	4,354	4,360	0.44	0.44	B	B	No	-
Between	27th Street	12th Street	3,441	3,445	0.57	0.57	B	B	No	-
Between	12th Street	I-880	3,788	3,792	0.63	0.63	C	C	No	-
Arterials										
Grand Avenue Eastbound										
Between	Adeline Street	San Pablo Ave	2,049	2,054	0.85	0.86	D	D	No	-
Between	San Pablo Ave	Telegraph Avenue	979	989	0.61	0.62	C	C	No	-
Between	Telegraph Avenue	Broadway	907	913	0.57	0.57	B	B	No	-
Between	Broadway	Harrison Street	1,277	1,277	0.80	0.80	D	D	No	-
Between	Harrison Street	MacArthur Blvd/I-580	1,265	1,265	0.79	0.79	D	D	No	-
Grand Avenue Westbound										
Between	MacArthur Blvd/I-580	Harrison Street	676	676	0.42	0.42	B	B	No	-
Between	Harrison Street	Broadway	1,314	1,314	0.82	0.82	D	D	No	-
Between	Broadway	Telegraph Avenue	1,662	1,668	1.04	1.04	F	F	-	No
Between	Telegraph Avenue	San Pablo Ave	1,172	1,181	0.73	0.74	C	C	No	-
Between	San Pablo Ave	Adeline Street	1,074	1,083	0.45	0.45	B	B	No	-
Broadway Northbound										
Between	20th Street	Grand Avenue	455	466	0.28	0.29	A	A	No	-
Between	Grand Avenue	27th Street	645	663	0.40	0.41	B	B	No	-
Between	27th Street	Piedmont Avenue	870	917	0.54	0.57	B	B	No	-
Between	Piedmont Avenue	MacArthur Blvd	950	974	0.59	0.61	C	C	No	-
Between	MacArthur Blvd	40th Street	1,045	1,067	0.65	0.67	C	C	No	-
Between	40th Street	51st Street	1,128	1,148	0.71	0.72	C	C	No	-
Between	51st Street	College Avenue	1,387	1,396	0.87	0.87	D	D	No	-

Shops at Broadway DEIR
MTS Roadway System Analysis Summary - 2020 PM

Link Location	Segment Limits		No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Broadway Southbound										
Between	College Avenue	51st Street	1,056	1,066	0.66	0.67	C	C	No	-
Between	51st Street	40th Street	617	640	0.39	0.40	B	B	No	-
Between	40th Street	MacArthur Blvd	815	840	0.51	0.52	B	B	No	-
Between	MacArthur Blvd	Piedmont Avenue	615	648	0.38	0.41	B	B	No	-
Between	Piedmont Avenue	27th Street	936	989	0.59	0.62	C	C	No	-
Between	27th Street	Grand Avenue	576	592	0.36	0.37	B	B	No	-
Between	Grand Avenue	20th Street	436	446	0.27	0.28	A	A	No	-
Telegraph Avenue Northbound										
Between	20th Street	Grand Avenue	374	374	0.23	0.23	A	A	No	-
Between	Grand Avenue	27th Street	975	979	0.61	0.61	C	C	No	-
Between	27th Street	MacArthur Blvd	591	604	0.37	0.38	B	B	No	-
Between	MacArthur Blvd	40th Street	1,022	1,033	0.64	0.65	C	C	No	-
Between	40th Street	Shattuck Avenue	1,463	1,472	0.91	0.92	E	E	No	-
Telegraph Avenue Southbound										
Between	Shattuck Avenue	40th Street	743	753	0.46	0.47	B	B	No	-
Between	40th Street	MacArthur Blvd	704	716	0.44	0.45	B	B	No	-
Between	MacArthur Blvd	27th Street	653	667	0.41	0.42	B	B	No	-
Between	27th Street	Grand Avenue	330	333	0.21	0.21	A	A	No	-
Between	Grand Avenue	20th Street	285	285	0.18	0.18	A	A	No	-
San Pablo Avenue Northbound										
Between	Grand Avenue	27th Street	1,682	1,682	1.05	1.05	F	F	-	No
Between	27th Street	Market Street	1,966	1,972	1.23	1.23	F	F	-	No
Between	Market Street	MacArthur Blvd	1,624	1,630	0.68	0.68	C	C	No	-
Between	MacArthur Blvd	40th Street	2,207	2,210	0.92	0.92	E	E	No	-
Between	40th Street	Powell Street	2,111	2,114	1.32	1.32	F	F	-	No
San Pablo Avenue Southbound										
Between	Powell Street	40th Street	2,093	2,096	1.31	1.31	F	F	-	No
Between	40th Street	MacArthur Blvd	2,773	2,776	1.16	1.16	F	F	-	No
Between	MacArthur Blvd	Market Street	2,051	2,057	0.85	0.86	D	D	No	-
Between	Market Street	27th Street	1,392	1,398	0.87	0.87	D	D	No	-
Between	27th Street	Grand Avenue	877	877	0.55	0.55	B	B	No	-

Shops at Broadway DEIR
MTS Roadway System Analysis Summary - 2020 PM

Link Location	Segment Limits		No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Harrison Street Northbound										
Between	20th Street	Grand Avenue	508	517	0.32	0.32	A	A	No	-
Between	Grand Avenue	27th Street	1,013	1,022	0.42	0.43	B	B	No	-
Between	27th Street	Oakland Avenue	905	905	0.57	0.57	B	B	No	-
Harrison Street Southbound										
Between	Monte Vista Avenue	I-580	936	936	0.39	0.39	B	B	No	-
Between	I-580	27th Street	256	256	0.16	0.16	A	A	No	-
Between	27th Street	Grand Avenue	393	401	0.16	0.17	A	A	No	-
Between	Grand Avenue	20th Street	187	195	0.12	0.12	A	A	No	-
14th Street Eastbound										
Between	Brush Street	Castro Street	195	195	0.12	0.12	A	A	No	-
Between	Castro Street	Broadway	199	199	0.12	0.12	A	A	No	-
Between	Broadway	Harrison Street	44	44	0.03	0.03	A	A	No	-
Between	Harrison Street	Lakeside Drive	3	3	0.00	0.00	A	A	No	-
14th Street Westbound										
Between	Lakeside Drive	Harrison Street	2	2	0.00	0.00	A	A	No	-
Between	Harrison Street	Broadway	111	111	0.07	0.07	A	A	No	-
Between	Broadway	Castro Street	182	182	0.11	0.11	A	A	No	-
Between	Castro Street	Brush Street	5	5	0.00	0.00	A	A	No	-

Fehr & Peers, 2013.

Shops at Broadway DEIR
MTS Roadway System Analysis Summary - 2035 PM

Link Location	Segment Limits		No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Freeway Segments										
I-980 Eastbound										
Between	I-880	12th Street	3,247	3,252	0.81	0.81	D	D	No	-
Between	12th Street	27th Street	4,174	4,174	0.70	0.70	C	C	No	-
Between	27th Street	I-580	6,097	6,108	0.61	0.61	C	C	No	-
I-980 Westbound										
Between	I-580	27th Street	4,969	4,975	0.50	0.50	B	B	No	-
Between	27th Street	12th Street	3,689	3,693	0.61	0.62	C	C	No	-
Between	12th Street	I-880	4,289	4,293	0.71	0.72	C	C	No	-
Arterials										
Grand Avenue Eastbound										
Between	Adeline Street	San Pablo Ave	2,817	2,822	1.17	1.18	F	F	-	No
Between	San Pablo Ave	Telegraph Avenue	1,979	1,989	1.24	1.24	F	F	-	No
Between	Telegraph Avenue	Broadway	1,725	1,731	1.08	1.08	F	F	-	No
Between	Broadway	Harrison Street	1,948	1,948	1.22	1.22	F	F	-	No
Between	Harrison Street	MacArthur Blvd/I-580	1,679	1,679	1.05	1.05	F	F	-	No
Grand Avenue Westbound										
Between	MacArthur Blvd/I-580	Harrison Street	1,061	1,061	0.66	0.66	C	C	No	-
Between	Harrison Street	Broadway	1,791	1,791	1.12	1.12	F	F	-	No
Between	Broadway	Telegraph Avenue	2,271	2,277	1.42	1.42	F	F	-	No
Between	Telegraph Avenue	San Pablo Ave	1,692	1,701	1.06	1.06	F	F	-	No
Between	San Pablo Ave	Adeline Street	1,883	1,892	0.78	0.79	D	D	No	-
Broadway Northbound										
Between	20th Street	Grand Avenue	601	612	0.38	0.38	B	B	No	-
Between	Grand Avenue	27th Street	1,057	1,075	0.66	0.67	C	C	No	-
Between	27th Street	Piedmont Avenue	1,406	1,453	0.88	0.91	D	E	No	-
Between	Piedmont Avenue	MacArthur Blvd	1,488	1,512	0.93	0.94	E	E	No	-
Between	MacArthur Blvd	40th Street	1,528	1,550	0.95	0.97	E	E	No	-
Between	40th Street	51st Street	1,549	1,569	0.97	0.98	E	E	No	-
Between	51st Street	College Avenue	1,786	1,795	1.12	1.12	F	F	-	No

Shops at Broadway DEIR
MTS Roadway System Analysis Summary - 2035 PM

Link Location	Segment Limits		No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Broadway Southbound										
Between	College Avenue	51st Street	1,337	1,347	0.84	0.84	D	D	No	-
Between	51st Street	40th Street	870	893	0.54	0.56	B	B	No	-
Between	40th Street	MacArthur Blvd	1,100	1,125	0.69	0.70	C	C	No	-
Between	MacArthur Blvd	Piedmont Avenue	974	1,007	0.61	0.63	C	C	No	-
Between	Piedmont Avenue	27th Street	1,393	1,446	0.87	0.90	D	D	No	-
Between	27th Street	Grand Avenue	829	845	0.52	0.53	B	B	No	-
Between	Grand Avenue	20th Street	423	433	0.26	0.27	A	A	No	-
Telegraph Avenue Northbound										
Between	20th Street	Grand Avenue	547	547	0.34	0.34	A	A	No	-
Between	Grand Avenue	27th Street	1,160	1,164	0.73	0.73	C	C	No	-
Between	27th Street	MacArthur Blvd	1,004	1,017	0.63	0.64	C	C	No	-
Between	MacArthur Blvd	40th Street	1,761	1,772	1.10	1.11	F	F	-	No
Between	40th Street	Shattuck Avenue	1,751	1,760	1.09	1.10	F	F	-	No
Telegraph Avenue Southbound										
Between	Shattuck Avenue	40th Street	1,068	1,078	0.67	0.67	C	C	No	-
Between	40th Street	MacArthur Blvd	1,187	1,199	0.74	0.75	C	C	No	-
Between	MacArthur Blvd	27th Street	1,236	1,250	0.77	0.78	D	D	No	-
Between	27th Street	Grand Avenue	568	571	0.36	0.36	B	B	No	-
Between	Grand Avenue	20th Street	400	400	0.25	0.25	A	A	No	-
San Pablo Avenue Northbound										
Between	Grand Avenue	27th Street	1,649	1,649	1.03	1.03	F	F	-	No
Between	27th Street	Market Street	2,043	2,049	1.28	1.28	F	F	-	No
Between	Market Street	MacArthur Blvd	2,098	2,104	0.87	0.88	D	D	No	-
Between	MacArthur Blvd	40th Street	2,669	2,672	1.11	1.11	F	F	-	No
Between	40th Street	Powell Street	2,236	2,239	1.40	1.40	F	F	-	No
San Pablo Avenue Southbound										
Between	Powell Street	40th Street	2,126	2,129	1.33	1.33	F	F	-	No
Between	40th Street	MacArthur Blvd	2,837	2,840	1.18	1.18	F	F	-	No
Between	MacArthur Blvd	Market Street	2,078	2,084	0.87	0.87	D	D	No	-
Between	Market Street	27th Street	1,959	1,965	1.22	1.23	F	F	-	No
Between	27th Street	Grand Avenue	1,270	1,270	0.79	0.79	D	D	No	-

Shops at Broadway DEIR
MTS Roadway System Analysis Summary - 2035 PM

Link Location	Segment Limits		No Project Volume	With Project Volume	V/C Ratio - No Project	V/C Ratio - With Project	No Project LOS	With Project LOS	Change from LOS E or better to LOS F	LOS F and Change in V/C >3%
Harrison Street Northbound										
Between	20th Street	Grand Avenue	855	864	0.53	0.54	B	B	No	-
Between	Grand Avenue	27th Street	1,379	1,388	0.57	0.58	B	B	No	-
Between	27th Street	Oakland Avenue	1,375	1,375	0.86	0.86	D	D	No	-
Harrison Street Southbound										
Between	Monte Vista Avenue	I-580	1,219	1,219	0.51	0.51	B	B	No	-
Between	I-580	27th Street	444	444	0.28	0.28	A	A	No	-
Between	27th Street	Grand Avenue	758	766	0.32	0.32	A	A	No	-
Between	Grand Avenue	20th Street	244	252	0.15	0.16	A	A	No	-
14th Street Eastbound										
Between	Brush Street	Castro Street	255	255	0.16	0.16	A	A	No	-
Between	Castro Street	Broadway	279	279	0.17	0.17	A	A	No	-
Between	Broadway	Harrison Street	96	96	0.06	0.06	A	A	No	-
Between	Harrison Street	Lakeside Drive	5	5	0.00	0.00	A	A	No	-
14th Street Westbound										
Between	Lakeside Drive	Harrison Street	3	3	0.00	0.00	A	A	No	-
Between	Harrison Street	Broadway	179	179	0.11	0.11	A	A	No	-
Between	Broadway	Castro Street	223	223	0.14	0.14	A	A	No	-
Between	Castro Street	Brush Street	13	13	0.01	0.01	A	A	No	-

Fehr & Peers, 2013.

Appendix B8

Queue Calculation Worksheets

FEHR PEERS

Int #	Street 1	Street 2	Movement/Lane Group	Storage Length	Existing PM	Existing Sat	Existing Plus Project PM	Existing Plus Project Sat
1	51st St.	Broadway						
1			EBL	125	#340	#240	#340	#240
1			EBT	800	#390	200	#390	200
1			WBL	300	160	#290	170	#310
1			WBT	530	240	#390	240	#390
1			NBT	400	310	260	#320	270
1			SBL	300	#320	260	#320	260
1			SBT	700	160	170	170	180
1			SBR	700	50	60	50	60
2	40th St.	40th St Way						
2			EBT	325	70	50	70	50
2			WBT	725	70	50	70	50
2			NBL	170	50	50	50	50
2			NBT	450	220	130	220	140
2			SBT	275	70	120	80	130
3	W MacArthur Blvd.	Telegraph Ave.						
3			EBT	1000	90	60	90	60
3			WBT	1000	80	60	80	70
3			NBL	180	110	0	110	0
3			NBT	1000	100	0	100	0
3			SBL	250	100	m50	100	m50
3			SBT	1000	110	70	110	70
4	W MacArthur Blvd.	Broadway						
4			EBL	125	140	90	140	90
4			EBT	1000	290	110	290	110
4			EBR	1000	40	30	40	30
4			WBL	140	130	100	130	100
4			WBT	350	190	160	190	160
4			WBR	350	60	170	60	170
4			NBL	120	160	100	170	100
4			NBT	350	320	140	#350	150
4			SBL	175	220	#300	220	#300
4			SBT	250	160	120	170	130
4			SBR	130	20	30	20	30

Int #	Street 1	Street 2	Movement/Lane Group	Storage Length	Existing PM	Existing Sat	Existing Plus Project PM	Existing Plus Project Sat
5	W MacArthur Blvd.	Piedmont Ave.						
5			EBL	120	#130	m70	#130	m70
5			EBT	250	#580	m240	#580	m240
5			WBL	120	#180	70	#200	#90
5			WBT	800	210	170	210	170
5			NBT	1000	230	160	240	160
5			NBR	1000	130	50	140	50
5			SBL	100	190	180	190	180
5			SBT	300	130	110	140	120
6	Piedmont Ave.	Broadway						
6			WBL	60	100	50	110	50
6			NBT	75	10	0	10	0
6			NBR	75	#240	120	#260	140
6			SBL	75	90	60	90	60
6			SBT	150	190	130	200	150
7	30th St.	Broadway						
7			EBT	125	110	40	**#250**	120
7			WBT	250	50	30	50	30
7			NBL	125	m10	10	20	20
7			NBT	500	40	30	40	30
7			SBL	125	m40	20	m30	20
7			SBT	800	210	100	210	110
8	29th St.	Broadway						
8			EBT	150	170	70	170	70
8			WBT	500	110	90	110	100
8			NBL	125	40	40	40	40
8			NBT	350	210	130	210	140
8			SBL	125	10	20	m20	30
8			SBT	500	40	70	50	70

Int #	Street 1	Street 2	Movement/Lane Group	Storage Length	Existing PM	Existing Sat	Existing Plus Project PM	Existing Plus Project Sat
9	27th St.	Telegraph Ave.						
9			EBL	500	110	100	120	100
9			EBT	500	130	60	130	60
9			WBL	1000	50	40	m50	40
9			WBT	1000	230	60	230	70
9			NBL	70	210	90	m#220	m90
9			NBT	180	80	120	90	120
9			SBL	270	60	70	60	70
9			SBT	600	120	160	120	170
10	27th St.	Broadway						
10			EBL	500	60	90	60	90
10			EBT	500	80	50	80	50
10			WBT	350	130	50	130	50
10			WBR	350	70	30	80	40
10			NBL	90	120	70	120	70
10			NBT	300	220	140	220	150
10			SBL	75	90	80	**140**	100
10			SBT	225	200	130	210	140
11	27th Street	Harrison St						
11			EBL	700	260	110	260	110
11			EBT	700	280	160	#290	160
11			EBR	50	180	80	#200	100
11			WBL	175	110	130	110	#130
11			WBT	175	210	250	230	270
11			WBR	175	70	70	70	70
11			NBL	400	250	110	#260	120
11			NBT	400	600	180	600	180
11			SBL	150	340	260	#340	#260
11			SBT	325	250	160	250	160

Int #	Street 1	Street 2	Movement/Lane Group	Storage Length	Existing		Existing Plus Project	
					PM	Sat	PM	Sat
12	Grand Ave.	Broadway						
12			EBL	500	100	60	m110	60
12			EBT	500	260	90	260	90
12			WBT	325	170	120	170	120
12			NBL	150	150	40	150	40
12			NBT	150	110	60	110	60
12			NBR	150	40	20	40	20
12			SBL	125	40	30	40	30
12			SBT	200	60	60	60	60
13	30th Street	Project Driveway						
13			EBT	125	0	0	20	20
13			WBT	60	0	0	20	20
13			SBT		0	0	**40**	**40**
61	Hawthorne Ave.	Broadway						
61			EBT	350	140	30	140	30
61			EBR	60	20	20	20	20
61			NBL	100	m10	10	m10	m20
61			NBT	800	180	60	240	90

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	245	795	144	715	1062	238	501	103
v/c Ratio	1.02	0.89	0.69	0.77	0.85	0.67	0.46	0.24
Control Delay	110.2	52.5	63.4	33.3	45.9	50.4	38.7	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.2	52.5	63.4	33.3	45.9	50.4	38.7	8.5
Queue Length 50th (ft)	~179	277	98	172	256	184	122	0
Queue Length 95th (ft)	#342	#385	164	242	311	#318	162	45
Internal Link Dist (ft)		1801		714	2797		621	
Turn Bay Length (ft)	125		300			300		
Base Capacity (vph)	241	913	241	993	1249	353	1089	437
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.87	0.60	0.72	0.85	0.67	0.46	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL2	EBT	WBT	NBL	NBT	SBT	SWR2
Lane Group Flow (vph)	276	372	233	94	879	451	17
v/c Ratio	1.04	0.38	0.44	0.16	0.40	0.18	0.02
Control Delay	92.9	17.8	30.3	7.8	9.2	9.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.9	17.8	30.3	7.8	9.2	9.2	0.0
Queue Length 50th (ft)	~148	62	57	13	87	29	0
Queue Length 95th (ft)	142	69	67	50	216	72	0
Internal Link Dist (ft)		521	538		1233	2797	
Turn Bay Length (ft)	170			170			
Base Capacity (vph)	266	1564	1068	590	2217	2469	1066
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.24	0.22	0.16	0.40	0.18	0.02

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	550	481	199	567	192	624
v/c Ratio	0.57	0.55	0.44	0.27	0.40	0.30
Control Delay	20.3	19.8	12.6	7.3	11.5	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	19.8	12.6	7.3	11.5	7.4
Queue Length 50th (ft)	57	49	31	39	29	44
Queue Length 95th (ft)	87	77	111	95	101	106
Internal Link Dist (ft)	2692	442		1889		893
Turn Bay Length (ft)			180		250	
Base Capacity (vph)	1968	3451	453	2101	485	2093
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.14	0.44	0.27	0.40	0.30

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	640	64	103	426	182	144	725	228	421	36
v/c Ratio	0.62	0.59	0.13	0.59	0.40	0.32	0.69	0.82	0.73	0.38	0.07
Control Delay	62.4	37.1	9.3	60.5	33.8	6.9	63.4	46.5	56.3	30.0	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	37.1	9.3	60.5	33.8	6.9	63.4	46.5	56.3	30.0	8.0
Queue Length 50th (ft)	77	207	0	70	129	0	98	243	154	121	0
Queue Length 95th (ft)	136	293	35	126	191	56	164	322	222	155	22
Internal Link Dist (ft)		1434			629			1262		1233	
Turn Bay Length (ft)	125			140			120		175		130
Base Capacity (vph)	209	1087	505	209	1078	570	241	916	418	1255	567
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.59	0.13	0.49	0.40	0.32	0.60	0.79	0.55	0.34	0.06

Intersection Summary

Queues
5: W MacArthur Blvd. & Piedmont Ave.

5/30/2013

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	100	1134	94	836	264	337	217	165
v/c Ratio	0.67	0.77	1.18	0.42	0.76	0.69	0.72	0.53
Control Delay	66.1	31.3	199.1	22.8	52.0	16.9	52.0	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.1	31.3	199.1	22.8	52.0	16.9	52.0	35.7
Queue Length 50th (ft)	62	315	~72	129	159	43	133	79
Queue Length 95th (ft)	#129	#580	#175	208	231	129	192	131
Internal Link Dist (ft)		629		1448	1373			704
Turn Bay Length (ft)	120		120				100	
Base Capacity (vph)	165	1477	80	2002	460	564	443	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.77	1.18	0.42	0.57	0.60	0.49	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	303	709	356	109	644
v/c Ratio	0.42	0.32	0.86	0.41	0.49
Control Delay	27.3	0.7	40.0	25.9	22.1
Queue Delay	0.0	0.5	232.5	0.0	0.0
Total Delay	27.3	1.3	272.5	25.9	22.1
Queue Length 50th (ft)	62	3	140	43	138
Queue Length 95th (ft)	100	6	#237	92	188
Internal Link Dist (ft)	1373	52			1262
Turn Bay Length (ft)	60		75	75	
Base Capacity (vph)	713	2282	428	266	1324
Starvation Cap Reductn	0	1086	193	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.42	0.59	1.51	0.41	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	168	76	42	793	35	762
v/c Ratio	0.39	0.18	0.11	0.37	0.10	0.35
Control Delay	20.5	16.1	3.0	2.9	18.4	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	16.1	3.0	2.9	18.4	20.1
Queue Length 50th (ft)	50	17	3	32	14	164
Queue Length 95th (ft)	106	50	m7	36	m36	208
Internal Link Dist (ft)	463	335		404		737
Turn Bay Length (ft)			125		125	
Base Capacity (vph)	428	434	377	2158	359	2153
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.18	0.11	0.37	0.10	0.35

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	247	149	45	880	91	751
v/c Ratio	0.53	0.36	0.12	0.42	0.29	0.36
Control Delay	27.8	25.1	13.6	15.4	5.1	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	25.1	13.6	15.4	5.1	3.6
Queue Length 50th (ft)	99	57	15	157	7	31
Queue Length 95th (ft)	173	110	38	208	14	39
Internal Link Dist (ft)	485	499		662		404
Turn Bay Length (ft)			125		125	
Base Capacity (vph)	469	412	365	2090	311	2113
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.36	0.12	0.42	0.29	0.36

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	438	43	599	187	519	120	847
v/c Ratio	0.60	0.46	0.29	0.77	0.69	0.27	0.27	0.44
Control Delay	48.6	22.8	37.9	46.4	33.4	9.9	13.6	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	22.8	37.9	46.4	33.4	9.9	13.6	8.4
Queue Length 50th (ft)	61	81	21	171	90	62	33	83
Queue Length 95th (ft)	114	127	m52	226	m#209	84	62	115
Internal Link Dist (ft)		515		1009		513		1790
Turn Bay Length (ft)					70		270	
Base Capacity (vph)	229	1024	229	909	271	1915	437	1926
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.43	0.19	0.66	0.69	0.27	0.27	0.44

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	105	408	417	201	136	697	138	759
v/c Ratio	0.34	0.32	0.35	0.31	0.45	0.37	0.42	0.41
Control Delay	19.5	14.4	20.0	6.9	32.2	23.3	16.9	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.2
Total Delay	19.5	14.4	20.0	6.9	32.2	26.3	16.9	12.4
Queue Length 50th (ft)	31	54	89	26	60	157	55	155
Queue Length 95th (ft)	62	84	128	66	119	216	91	199
Internal Link Dist (ft)		1009	226			217		662
Turn Bay Length (ft)					90		75	
Base Capacity (vph)	308	1292	1193	658	301	1882	330	1856
Starvation Cap Reductn	0	0	0	0	0	1047	0	0
Spillback Cap Reductn	0	2	0	0	0	0	0	332
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.32	0.35	0.31	0.45	0.83	0.42	0.50

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	182	365	102	59	155	177	294	1028	185	501
v/c Ratio	0.65	0.86	0.67	0.61	0.43	0.42	0.89	0.72	0.90	0.36
Control Delay	74.0	88.2	85.4	100.1	59.6	9.7	99.3	45.4	110.8	33.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Total Delay	74.0	88.2	85.4	100.1	59.6	9.7	99.3	45.9	110.8	33.0
Queue Length 50th (ft)	178	198	98	61	140	0	159	509	194	194
Queue Length 95th (ft)	264	#275	#178	114	214	67	#250	601	#340	247
Internal Link Dist (ft)		706			187			436		482
Turn Bay Length (ft)			50				100		150	
Base Capacity (vph)	310	443	158	111	408	453	331	1419	212	1376
Starvation Cap Reductn	0	0	0	0	0	0	0	120	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.82	0.65	0.53	0.38	0.39	0.89	0.79	0.87	0.36

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	100	719	452	240	565	133	85	483
v/c Ratio	0.47	0.70	0.67	0.47	0.26	0.14	0.18	0.23
Control Delay	28.9	27.0	43.7	14.5	8.9	4.9	6.1	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	27.0	43.7	14.5	8.9	4.9	6.1	3.9
Queue Length 50th (ft)	54	202	123	73	76	14	12	32
Queue Length 95th (ft)	m100	258	172	145	110	40	43	60
Internal Link Dist (ft)		587	307		909			193
Turn Bay Length (ft)	250			300		50	125	
Base Capacity (vph)	307	1462	960	510	2161	937	468	2084
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.49	0.47	0.47	0.26	0.14	0.18	0.23

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	161	31	10	23	877	881
v/c Ratio	0.57	0.10	0.02	0.10	0.66	0.40
Control Delay	41.2	10.7	0.1	7.4	12.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	2.3	0.2
Total Delay	41.2	10.7	0.1	7.4	14.3	1.5
Queue Length 50th (ft)	79	0	0	3	108	3
Queue Length 95th (ft)	141	22	0	m10	178	0
Internal Link Dist (ft)	433				737	52
Turn Bay Length (ft)		60		100		
Base Capacity (vph)	301	367	448	223	1323	2213
Starvation Cap Reductn	0	0	0	0	0	466
Spillback Cap Reductn	0	0	0	0	303	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.08	0.02	0.10	0.86	0.50

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	481	217	876	922	211	530	163
v/c Ratio	0.80	0.55	0.91	0.92	0.75	0.63	0.51	0.36
Control Delay	72.3	35.8	86.1	48.5	39.9	48.9	40.1	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.3	35.8	86.1	48.5	39.9	48.9	40.1	8.1
Queue Length 50th (ft)	127	142	153	265	207	160	130	0
Queue Length 95th (ft)	#236	195	#294	#386	258	258	170	55
Internal Link Dist (ft)		1801		714	2797		621	
Turn Bay Length (ft)	125		300			300		
Base Capacity (vph)	241	903	241	964	1237	336	1040	458
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.53	0.90	0.91	0.75	0.63	0.51	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL2	EBT	WBT	NBL	NBT	SBT	SWR2
Lane Group Flow (vph)	194	302	161	100	565	735	57
v/c Ratio	0.69	0.33	0.34	0.21	0.25	0.29	0.05
Control Delay	37.9	14.0	29.6	7.8	7.5	9.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	14.0	29.6	7.8	7.5	9.4	0.1
Queue Length 50th (ft)	87	40	40	12	45	49	0
Queue Length 95th (ft)	100	50	48	53	128	120	0
Internal Link Dist (ft)		521	538		1233	2797	
Turn Bay Length (ft)	170			170			
Base Capacity (vph)	280	1540	1070	469	2276	2567	1093
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.20	0.15	0.21	0.25	0.29	0.05

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	324	468	90	497	103	491
v/c Ratio	0.45	0.52	0.16	0.21	0.18	0.21
Control Delay	22.3	18.7	6.0	4.8	4.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	18.7	6.0	4.8	4.6	3.1
Queue Length 50th (ft)	42	50	5	14	2	2
Queue Length 95th (ft)	55	64	2	2	m52	67
Internal Link Dist (ft)	2692	442		1889		893
Turn Bay Length (ft)			180		250	
Base Capacity (vph)	1121	1866	579	2316	575	2295
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.25	0.16	0.21	0.18	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	74	277	40	72	343	302	80	371	271	383	68
v/c Ratio	0.48	0.22	0.07	0.47	0.27	0.43	0.55	0.48	0.85	0.32	0.12
Control Delay	53.8	26.9	9.8	54.1	37.0	18.2	58.1	33.7	64.7	25.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	26.9	9.8	54.1	37.0	18.2	58.1	33.7	64.7	25.0	5.7
Queue Length 50th (ft)	45	75	0	45	95	1	49	95	167	87	0
Queue Length 95th (ft)	91	112	26	95	160	171	97	137	#296	124	27
Internal Link Dist (ft)		1434			629			1262		1233	
Turn Bay Length (ft)	125			140			120		175		130
Base Capacity (vph)	177	1258	580	177	1256	695	159	981	336	1345	608
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.22	0.07	0.41	0.27	0.43	0.50	0.38	0.81	0.28	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	73	600	52	729	176	151	199	151
v/c Ratio	0.55	0.36	0.44	0.33	0.64	0.46	0.69	0.47
Control Delay	68.4	23.5	56.8	18.3	49.2	10.2	51.2	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.4	23.5	56.8	18.3	49.2	10.2	51.2	28.3
Queue Length 50th (ft)	50	93	32	91	108	0	122	58
Queue Length 95th (ft)	m67	m242	71	173	156	49	176	106
Internal Link Dist (ft)		629		1448	1373			704
Turn Bay Length (ft)	120		120				100	
Base Capacity (vph)	150	1651	133	2228	461	449	443	465
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.36	0.39	0.33	0.38	0.34	0.45	0.32

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	137	409	191	66	464
v/c Ratio	0.18	0.19	0.44	0.23	0.43
Control Delay	21.5	0.5	18.3	22.7	22.7
Queue Delay	0.0	0.4	63.7	0.0	0.0
Total Delay	21.5	0.9	82.0	22.7	22.7
Queue Length 50th (ft)	23	1	65	23	91
Queue Length 95th (ft)	45	2	122	55	133
Internal Link Dist (ft)	1373	52			1262
Turn Bay Length (ft)	60		75	75	
Base Capacity (vph)	756	2161	444	288	1076
Starvation Cap Reductn	0	1220	269	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.43	1.09	0.23	0.43

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	51	32	594	31	617
v/c Ratio	0.13	0.10	0.08	0.30	0.07	0.31
Control Delay	12.8	13.9	3.4	3.4	11.5	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	13.9	3.4	3.4	11.5	10.4
Queue Length 50th (ft)	12	11	2	23	6	60
Queue Length 95th (ft)	39	34	6	31	20	103
Internal Link Dist (ft)	463	335		404		737
Turn Bay Length (ft)			125		125	
Base Capacity (vph)	517	507	411	1971	421	1973
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.10	0.08	0.30	0.07	0.31

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	158	47	545	59	504
v/c Ratio	0.23	0.32	0.10	0.29	0.14	0.26
Control Delay	15.6	18.7	9.3	10.9	8.4	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.6	18.7	9.3	10.9	8.4	9.2
Queue Length 50th (ft)	31	47	18	107	14	60
Queue Length 95th (ft)	69	94	40	133	24	65
Internal Link Dist (ft)	485	499		662		404
Turn Bay Length (ft)			125		125	
Base Capacity (vph)	545	493	461	1895	424	1925
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.32	0.10	0.29	0.14	0.26

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	264	30	326	118	422	76	540
v/c Ratio	0.53	0.25	0.20	0.43	0.29	0.23	0.16	0.30
Control Delay	39.6	11.9	35.2	21.2	16.7	11.8	14.5	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	11.9	35.2	21.2	16.7	11.8	14.5	10.8
Queue Length 50th (ft)	50	22	0	38	44	78	25	80
Queue Length 95th (ft)	97	55	42	62	m92	117	73	163
Internal Link Dist (ft)		515		1009		513		1790
Turn Bay Length (ft)					70		270	
Base Capacity (vph)	260	1204	260	1035	406	1871	478	1823
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.22	0.12	0.31	0.29	0.23	0.16	0.30

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	193	215	184	60	374	110	505
v/c Ratio	0.19	0.13	0.15	0.24	0.17	0.23	0.25	0.32
Control Delay	17.6	12.1	13.3	3.2	25.8	24.9	16.4	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	12.1	13.3	3.2	25.8	24.9	16.4	15.0
Queue Length 50th (ft)	26	18	30	0	29	94	41	92
Queue Length 95th (ft)	85	53	51	33	68	142	79	130
Internal Link Dist (ft)		1009	226			217		662
Turn Bay Length (ft)					90		75	
Base Capacity (vph)	490	1498	1409	756	361	1619	435	1595
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.13	0.15	0.24	0.17	0.23	0.25	0.32

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	212	46	64	185	198	138	366	152	347
v/c Ratio	0.26	0.51	0.38	0.63	0.52	0.50	0.55	0.25	0.80	0.23
Control Delay	60.7	70.5	58.9	99.3	62.2	11.0	79.4	31.6	97.5	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.7	70.5	58.9	99.3	62.2	11.0	79.4	31.6	97.5	27.9
Queue Length 50th (ft)	63	110	33	66	170	0	73	136	156	118
Queue Length 95th (ft)	114	156	79	#125	252	74	109	181	#256	164
Internal Link Dist (ft)		706			187			436		482
Turn Bay Length (ft)			50				100		150	
Base Capacity (vph)	310	442	128	111	408	420	322	1455	210	1519
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.48	0.36	0.58	0.45	0.47	0.43	0.25	0.72	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	77	397	379	82	321	110	57	367
v/c Ratio	0.34	0.41	0.49	0.14	0.15	0.12	0.09	0.17
Control Delay	22.3	19.5	20.9	9.0	7.6	2.3	8.6	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	19.5	20.9	9.0	7.6	2.3	8.6	6.7
Queue Length 50th (ft)	24	59	80	18	36	0	12	35
Queue Length 95th (ft)	56	92	115	40	56	21	29	57
Internal Link Dist (ft)		587	307		909			193
Turn Bay Length (ft)	250			300		50	125	
Base Capacity (vph)	369	1536	1227	587	2173	941	612	2098
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.26	0.31	0.14	0.15	0.12	0.09	0.17

Intersection Summary

Lane Group	EBT	EBR	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	30	19	16	30	553	556
v/c Ratio	0.09	0.06	0.02	0.12	0.51	0.28
Control Delay	25.9	10.6	0.1	11.5	12.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.3
Total Delay	25.9	10.6	0.1	11.5	12.2	1.7
Queue Length 50th (ft)	12	0	0	4	36	0
Queue Length 95th (ft)	33	15	0	13	63	0
Internal Link Dist (ft)	433				737	52
Turn Bay Length (ft)		60		100		
Base Capacity (vph)	342	407	680	247	1074	1964
Starvation Cap Reductn	0	0	0	0	0	786
Spillback Cap Reductn	0	0	16	0	105	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.05	0.02	0.12	0.57	0.47

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	245	800	152	715	1082	238	511	103
v/c Ratio	1.02	0.90	0.71	0.77	0.87	0.68	0.47	0.24
Control Delay	110.2	53.4	64.8	33.0	47.0	50.8	38.9	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.2	53.4	64.8	33.0	47.0	50.8	38.9	8.5
Queue Length 50th (ft)	~179	281	103	172	261	184	125	0
Queue Length 95th (ft)	#342	#388	172	242	#320	#318	165	45
Internal Link Dist (ft)		1801		714	2797		621	
Turn Bay Length (ft)	125		300			300		
Base Capacity (vph)	241	910	241	993	1248	350	1082	435
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.88	0.63	0.72	0.87	0.68	0.47	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL2	EBT	WBT	NBL	NBT	SBT	SWR2
Lane Group Flow (vph)	276	374	233	96	899	474	17
v/c Ratio	1.04	0.39	0.44	0.17	0.41	0.19	0.02
Control Delay	92.9	17.6	30.3	7.8	9.3	9.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.9	17.6	30.3	7.8	9.3	9.5	0.0
Queue Length 50th (ft)	~148	61	57	13	90	32	0
Queue Length 95th (ft)	142	68	67	51	223	77	0
Internal Link Dist (ft)		521	538		1233	2797	
Turn Bay Length (ft)	170			170			
Base Capacity (vph)	266	1564	1067	578	2217	2473	1066
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.24	0.22	0.17	0.41	0.19	0.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	554	483	201	578	192	636
v/c Ratio	0.58	0.55	0.45	0.27	0.40	0.30
Control Delay	20.3	19.9	13.0	7.3	11.7	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	19.9	13.0	7.3	11.7	7.5
Queue Length 50th (ft)	58	49	31	40	29	45
Queue Length 95th (ft)	87	77	114	97	102	108
Internal Link Dist (ft)	2692	442		1889		893
Turn Bay Length (ft)			180		250	
Base Capacity (vph)	1967	3447	446	2102	479	2092
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.14	0.45	0.27	0.40	0.30

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	113	640	66	103	426	182	146	747	228	446	36
v/c Ratio	0.62	0.60	0.13	0.59	0.40	0.32	0.70	0.84	0.73	0.40	0.07
Control Delay	62.4	37.5	9.2	60.5	34.1	6.9	63.8	46.9	56.3	30.1	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	37.5	9.2	60.5	34.1	6.9	63.8	46.9	56.3	30.1	8.0
Queue Length 50th (ft)	77	209	0	70	131	0	99	251	154	127	0
Queue Length 95th (ft)	136	293	36	126	191	56	167	#353	222	165	22
Internal Link Dist (ft)		1434			629			1262		1233	
Turn Bay Length (ft)	125			140			120		175		130
Base Capacity (vph)	209	1072	501	209	1063	565	241	922	418	1255	567
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.60	0.13	0.49	0.40	0.32	0.61	0.81	0.55	0.36	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	100	1134	106	836	271	348	217	173
v/c Ratio	0.67	0.77	1.32	0.42	0.77	0.71	0.72	0.55
Control Delay	66.1	31.6	249.4	22.9	52.3	18.2	52.0	37.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.1	31.6	249.4	22.9	52.3	18.2	52.0	37.6
Queue Length 50th (ft)	62	317	~88	130	164	49	133	86
Queue Length 95th (ft)	#129	#580	#196	208	237	140	192	139
Internal Link Dist (ft)		629		1448	1373			704
Turn Bay Length (ft)	120		120				100	
Base Capacity (vph)	165	1467	80	1988	460	564	443	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.77	1.32	0.42	0.59	0.62	0.49	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	323	733	374	109	677
v/c Ratio	0.45	0.33	0.89	0.42	0.51
Control Delay	28.3	0.7	44.1	26.4	22.5
Queue Delay	0.0	0.6	255.9	0.0	0.0
Total Delay	28.3	1.3	300.0	26.4	22.5
Queue Length 50th (ft)	68	3	152	43	146
Queue Length 95th (ft)	108	6	#260	93	199
Internal Link Dist (ft)	1373	52			1262
Turn Bay Length (ft)	60		75	75	
Base Capacity (vph)	712	2282	431	260	1324
Starvation Cap Reductn	0	1090	193	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.61	1.57	0.42	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	316	76	120	762	35	815
v/c Ratio	0.73	0.18	0.34	0.35	0.09	0.38
Control Delay	34.6	16.2	5.0	2.9	17.7	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.6	16.2	5.0	2.9	17.7	19.9
Queue Length 50th (ft)	127	17	10	31	14	171
Queue Length 95th (ft)	#248	50	16	35	m33	214
Internal Link Dist (ft)	36	335		404		737
Turn Bay Length (ft)			125		125	
Base Capacity (vph)	430	421	351	2156	375	2126
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.18	0.34	0.35	0.09	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	247	156	45	921	97	791
v/c Ratio	0.53	0.38	0.13	0.44	0.33	0.37
Control Delay	27.8	24.9	13.5	15.4	6.2	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	24.9	13.5	15.4	6.2	4.2
Queue Length 50th (ft)	99	59	15	164	11	47
Queue Length 95th (ft)	173	113	38	214	m18	51
Internal Link Dist (ft)	485	499		662		404
Turn Bay Length (ft)			125		125	
Base Capacity (vph)	468	415	346	2093	293	2113
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.38	0.13	0.44	0.33	0.37

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	442	43	607	187	523	120	859
v/c Ratio	0.63	0.42	0.29	0.77	0.77	0.29	0.29	0.47
Control Delay	50.1	21.8	37.7	47.6	41.8	10.5	14.2	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	21.8	37.7	47.6	41.8	10.5	14.2	8.8
Queue Length 50th (ft)	65	82	21	172	93	63	33	83
Queue Length 95th (ft)	121	130	m50	228	m#216	85	63	115
Internal Link Dist (ft)		515		1009		513		1790
Turn Bay Length (ft)					70		270	
Base Capacity (vph)	229	1043	229	909	244	1820	407	1847
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.42	0.19	0.67	0.77	0.29	0.29	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	109	408	417	220	136	715	155	783
v/c Ratio	0.35	0.32	0.35	0.34	0.47	0.38	0.48	0.42
Control Delay	19.9	15.1	20.0	8.2	32.9	23.2	20.3	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.2
Total Delay	19.9	15.1	20.0	8.2	32.9	26.5	20.3	13.7
Queue Length 50th (ft)	32	54	89	32	60	161	64	164
Queue Length 95th (ft)	64	84	128	81	119	220	135	211
Internal Link Dist (ft)		1009	226			217		662
Turn Bay Length (ft)					90		75	
Base Capacity (vph)	308	1292	1193	653	291	1882	321	1855
Starvation Cap Reductn	0	0	0	0	0	1041	0	0
Spillback Cap Reductn	0	2	0	0	0	0	0	326
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.32	0.35	0.34	0.47	0.85	0.48	0.51

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	182	374	110	59	165	177	303	1028	185	501
v/c Ratio	0.65	0.87	0.72	0.61	0.46	0.42	0.91	0.73	0.90	0.37
Control Delay	74.0	89.9	89.8	100.1	60.3	9.7	101.1	45.4	110.8	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Total Delay	74.0	89.9	89.8	100.1	60.3	9.7	101.1	46.0	110.8	33.1
Queue Length 50th (ft)	178	204	107	61	150	0	165	509	194	194
Queue Length 95th (ft)	264	#287	#200	114	227	67	#261	601	#340	247
Internal Link Dist (ft)		706			187			436		482
Turn Bay Length (ft)			50				100		150	
Base Capacity (vph)	310	443	158	111	408	453	334	1417	212	1370
Starvation Cap Reductn	0	0	0	0	0	0	0	120	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.84	0.70	0.53	0.40	0.39	0.91	0.79	0.87	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	106	719	452	240	576	133	85	499
v/c Ratio	0.50	0.70	0.67	0.48	0.27	0.14	0.18	0.24
Control Delay	30.0	27.0	43.7	14.8	8.9	4.9	6.3	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	27.0	43.7	14.8	8.9	4.9	6.3	4.1
Queue Length 50th (ft)	57	202	123	73	77	14	12	36
Queue Length 95th (ft)	m106	258	172	147	112	40	44	64
Internal Link Dist (ft)		587	307		909			193
Turn Bay Length (ft)	250			300		50	125	
Base Capacity (vph)	307	1462	960	500	2161	937	463	2082
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.49	0.47	0.48	0.27	0.14	0.18	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	27	168	82	161	148	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	168	82	161	148	25
Pedestrians		50	50		50	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		4	4		4	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			116			
pX, platoon unblocked	0.98				0.98	0.98
vC, conflicting volume	293				484	262
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266				462	235
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				70	97
cM capacity (veh/h)	1217				490	722

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	195	243	173
Volume Left	27	0	148
Volume Right	0	161	25
cSH	1217	1700	514
Volume to Capacity	0.02	0.14	0.34
Queue Length 95th (ft)	2	0	37
Control Delay (s)	1.3	0.0	15.5
Lane LOS	A		C
Approach Delay (s)	1.3	0.0	15.5
Approach LOS			C

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	161	31	10	23	918	934
v/c Ratio	0.57	0.10	0.02	0.11	0.69	0.42
Control Delay	41.2	10.7	0.1	9.4	14.9	1.4
Queue Delay	0.0	0.0	0.0	0.0	4.0	0.2
Total Delay	41.2	10.7	0.1	9.4	18.9	1.5
Queue Length 50th (ft)	79	0	0	4	169	3
Queue Length 95th (ft)	141	22	0	m11	239	0
Internal Link Dist (ft)	433				737	52
Turn Bay Length (ft)		60		100		
Base Capacity (vph)	301	367	445	211	1323	2216
Starvation Cap Reductn	0	0	0	0	0	432
Spillback Cap Reductn	0	0	0	0	315	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.08	0.02	0.11	0.91	0.52

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	487	227	876	949	211	543	163
v/c Ratio	0.80	0.56	0.94	0.92	0.77	0.63	0.52	0.36
Control Delay	72.3	35.8	92.8	48.5	40.6	48.9	40.3	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.3	35.8	92.8	48.5	40.6	48.9	40.3	8.1
Queue Length 50th (ft)	127	143	161	265	215	160	133	0
Queue Length 95th (ft)	#236	197	#311	#386	267	258	175	55
Internal Link Dist (ft)		1801		714	2797		621	
Turn Bay Length (ft)	125		300			300		
Base Capacity (vph)	241	904	241	964	1238	336	1041	458
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.54	0.94	0.91	0.77	0.63	0.52	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL2	EBT	WBT	NBL	NBT	SBT	SWR2
Lane Group Flow (vph)	194	304	161	102	591	764	57
v/c Ratio	0.69	0.33	0.34	0.22	0.26	0.30	0.05
Control Delay	37.9	13.9	29.6	8.0	7.6	9.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	13.9	29.6	8.0	7.6	9.6	0.1
Queue Length 50th (ft)	87	40	40	13	47	52	0
Queue Length 95th (ft)	100	50	48	54	135	126	0
Internal Link Dist (ft)		521	538		1233	2797	
Turn Bay Length (ft)	170			170			
Base Capacity (vph)	280	1540	1070	456	2276	2571	1092
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.20	0.15	0.22	0.26	0.30	0.05

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	328	470	92	511	103	506
v/c Ratio	0.45	0.52	0.16	0.22	0.18	0.22
Control Delay	22.2	18.7	6.0	4.9	4.7	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	18.7	6.0	4.9	4.7	3.2
Queue Length 50th (ft)	43	50	6	14	2	3
Queue Length 95th (ft)	56	65	3	4	m52	73
Internal Link Dist (ft)	2692	442		1889		893
Turn Bay Length (ft)			180		250	
Base Capacity (vph)	1123	1866	570	2317	568	2296
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.25	0.16	0.22	0.18	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	74	277	42	72	343	302	82	399	271	415	68
v/c Ratio	0.48	0.22	0.07	0.47	0.28	0.44	0.56	0.51	0.85	0.35	0.12
Control Delay	53.8	27.0	9.5	54.3	37.3	18.4	58.8	34.4	64.7	25.2	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	27.0	9.5	54.3	37.3	18.4	58.8	34.4	64.7	25.2	5.7
Queue Length 50th (ft)	45	75	0	45	98	1	51	104	167	96	0
Queue Length 95th (ft)	91	112	26	95	158	170	100	148	#296	134	27
Internal Link Dist (ft)		1434			629			1262		1233	
Turn Bay Length (ft)	125			140			120		175		130
Base Capacity (vph)	177	1248	577	177	1246	692	159	981	336	1345	608
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.22	0.07	0.41	0.28	0.44	0.52	0.41	0.81	0.31	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

5: W MacArthur Blvd. & Piedmont Ave.

5/31/2013

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	73	600	68	729	185	165	199	161
v/c Ratio	0.55	0.37	0.57	0.33	0.65	0.48	0.69	0.51
Control Delay	68.6	23.8	63.1	18.5	49.7	10.1	51.2	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.6	23.8	63.1	18.5	49.7	10.1	51.2	31.6
Queue Length 50th (ft)	50	93	43	92	114	0	122	68
Queue Length 95th (ft)	m67	m243	#88	173	163	51	176	117
Internal Link Dist (ft)		629		1448	1373			704
Turn Bay Length (ft)	120		120				100	
Base Capacity (vph)	150	1633	133	2212	461	459	443	463
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.37	0.51	0.33	0.40	0.36	0.45	0.35

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	163	440	214	66	506
v/c Ratio	0.22	0.21	0.48	0.24	0.47
Control Delay	22.4	0.5	18.8	22.9	23.2
Queue Delay	0.0	0.5	91.9	0.0	0.0
Total Delay	22.4	1.0	110.7	22.9	23.2
Queue Length 50th (ft)	28	1	75	23	101
Queue Length 95th (ft)	53	2	140	55	146
Internal Link Dist (ft)	1373	52			1262
Turn Bay Length (ft)	60		75	75	
Base Capacity (vph)	758	2161	463	280	1076
Starvation Cap Reductn	0	1228	280	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.22	0.47	1.17	0.24	0.47

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	233	51	119	567	31	685
v/c Ratio	0.46	0.11	0.32	0.29	0.07	0.35
Control Delay	17.7	14.0	5.7	3.3	11.8	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	14.0	5.7	3.3	11.8	10.3
Queue Length 50th (ft)	58	11	9	21	6	65
Queue Length 95th (ft)	121	34	17	29	20	111
Internal Link Dist (ft)	45	335		404		737
Turn Bay Length (ft)			125		125	
Base Capacity (vph)	505	479	375	1972	436	1943
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.11	0.32	0.29	0.07	0.35

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	167	47	597	67	556
v/c Ratio	0.23	0.34	0.11	0.31	0.17	0.29
Control Delay	15.6	18.5	9.4	11.2	8.2	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.6	18.5	9.4	11.2	8.2	8.9
Queue Length 50th (ft)	31	48	17	118	15	69
Queue Length 95th (ft)	69	97	39	144	27	72
Internal Link Dist (ft)	485	499		662		404
Turn Bay Length (ft)			125		125	
Base Capacity (vph)	544	497	430	1899	396	1925
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.34	0.11	0.31	0.17	0.29

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	124	269	30	336	118	427	76	556
v/c Ratio	0.56	0.25	0.20	0.44	0.30	0.23	0.16	0.31
Control Delay	40.8	11.9	34.6	21.8	17.1	12.0	14.6	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	11.9	34.6	21.8	17.1	12.0	14.6	10.8
Queue Length 50th (ft)	55	22	15	41	44	80	24	82
Queue Length 95th (ft)	104	56	42	66	m93	119	72	165
Internal Link Dist (ft)		515		1009		513		1790
Turn Bay Length (ft)					70		270	
Base Capacity (vph)	260	1209	260	1033	393	1858	471	1810
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.22	0.12	0.33	0.30	0.23	0.16	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	98	193	215	208	60	397	132	535
v/c Ratio	0.20	0.13	0.15	0.27	0.17	0.25	0.31	0.34
Control Delay	17.9	12.2	13.3	3.1	26.1	25.2	18.7	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.9	12.2	13.3	3.1	26.1	25.2	18.7	16.0
Queue Length 50th (ft)	28	17	30	0	29	101	50	99
Queue Length 95th (ft)	89	54	51	35	68	150	104	139
Internal Link Dist (ft)		1009	226			217		662
Turn Bay Length (ft)					90		75	
Base Capacity (vph)	490	1498	1409	770	345	1619	421	1595
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.13	0.15	0.27	0.17	0.25	0.31	0.34

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	224	56	64	198	198	149	366	152	347
v/c Ratio	0.26	0.53	0.47	0.63	0.55	0.50	0.57	0.25	0.80	0.23
Control Delay	60.7	71.1	68.2	99.3	63.3	10.9	79.9	31.6	97.5	28.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.7	71.1	68.2	99.3	63.3	10.9	79.9	31.6	97.5	28.1
Queue Length 50th (ft)	63	117	46	66	183	0	78	136	156	119
Queue Length 95th (ft)	114	164	98	#125	269	74	117	181	#256	164
Internal Link Dist (ft)		706			187			436		482
Turn Bay Length (ft)			50				100		150	
Base Capacity (vph)	310	442	125	111	408	420	322	1451	210	1508
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.51	0.45	0.58	0.49	0.47	0.46	0.25	0.72	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	85	397	379	82	336	110	57	387
v/c Ratio	0.37	0.41	0.49	0.14	0.15	0.12	0.09	0.18
Control Delay	23.3	19.5	20.9	9.1	7.6	2.3	8.6	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	19.5	20.9	9.1	7.6	2.3	8.6	6.7
Queue Length 50th (ft)	26	59	80	18	37	0	12	37
Queue Length 95th (ft)	61	92	115	40	58	21	29	60
Internal Link Dist (ft)		587	307		909			193
Turn Bay Length (ft)	250			300		50	125	
Base Capacity (vph)	369	1536	1227	577	2173	941	604	2096
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.26	0.31	0.14	0.15	0.12	0.09	0.18

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	34	65	61	182	168	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	34	65	61	182	168	32
Pedestrians		50	50		50	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		4	4		4	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			125			
pX, platoon unblocked	0.98				0.98	0.98
vC, conflicting volume	293				385	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	264				358	222
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				70	96
cM capacity (veh/h)	1217				558	733

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	99	243	200
Volume Left	34	0	168
Volume Right	0	182	32
cSH	1217	1700	580
Volume to Capacity	0.03	0.14	0.34
Queue Length 95th (ft)	2	0	38
Control Delay (s)	2.9	0.0	14.4
Lane LOS	A		B
Approach Delay (s)	2.9	0.0	14.4
Approach LOS			B

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	30	19	16	30	607	624
v/c Ratio	0.09	0.06	0.02	0.13	0.56	0.32
Control Delay	25.9	10.6	0.1	12.4	13.8	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.8	0.3
Total Delay	25.9	10.6	0.1	12.4	14.7	1.7
Queue Length 50th (ft)	12	0	0	5	54	5
Queue Length 95th (ft)	33	15	0	m16	85	0
Internal Link Dist (ft)	433				737	52
Turn Bay Length (ft)		60		100		
Base Capacity (vph)	342	407	672	231	1075	1967
Starvation Cap Reductn	0	0	0	0	0	671
Spillback Cap Reductn	0	0	28	0	216	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.05	0.02	0.13	0.71	0.48

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX H

Alternatives Technical Detail

Table X
Shops at Broadway
Trip Generation Summary - Project

Land Use	Units[1]	ITE Code	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total
Grocery Store	26.0 KSF	850 [2]	3,132	55	33	88	125	121	246	141	136	277
Restaurant	4.3 KSF	931 [3]	387	2	1	3	21	11	32	28	19	47
Bank	3.0 KSF	912 [4]	444	21	15	36	37	36	73	40	39	79
Retail	2.7 KSF	820 [5]	115	2	1	3	5	5	10	7	6	13
Total			*4,078*	*80*	*50*	*130*	*188*	*173*	*361*	*216*	*200*	*416*
Pass-by Reduction [6]			-693	0	0	0	-61	-61	-122	-54	-54	-108
Net New Project Trips			**3,385**	**80**	**50**	**130**	**127**	**112**	**239**	**162**	**146**	**308**

1 KSF = 1,000 square feet.

2 ITE *Trip Generation (9th Edition)* land use category 850 (Grocery Store):

Daily: T = 66.95*(X) + 1391.56

AM Peak Hour: T = 3.40*(X) (62% in, 38% out)

PM Peak Hour: T = 9.48*(X) (51% in, 49% out)

Saturday Peak Hour: T = 10.65*(X) (51% in, 49% out)

3 *ITE Trip Generation (9th Edition)* land use category 931 (Quality Restaurant):

Daily: T = 89.95*(X)

AM Peak Hour: T = 0.81*(X) (82% in, 18% out)

PM Peak Hour: T = 7.49*(X) (67% in, 33% out)

Saturday Peak Hour: T = 10.82*(X) (59% in, 41% out)

4 *ITE Trip Generation (9th Edition)* land use category 912 (Drive-in Bank):

Daily: T = 148.15*(X)

AM Peak Hour: T = 12.08*(X) (57% in, 43% out)

PM Peak Hour: T = 24.30*(X) (50% in, 50% out)

Saturday Peak Hour: T = 26.31*(X) (51% in, 49% out)

5 *ITE Trip Generation (9th Edition)* land use category 820 (Shopping Center):

Daily: T = 42.70*(X)

AM Peak Hour: T = 0.96*(X) (62% in, 38% out)

PM Peak Hour: T = 3.71*(X) (48% in, 52% out)

Saturday Peak Hour: T = 4.82*(X) (52% in, 48% out)

6

Based on ITE *Trip Generation (9th Edition) User's Guide and Handbook,* the average weekday PM peak hour pass-by rates for land use categories 820, 850, 912, and 931 is 34%, 36%, 47%, and 44%, respectively. The average weekend peak pass-by rates for land use category 820 is 26%. A 17% daily pass-by rate, 34% PM peak hour pass-by rate, and 26% Saturday peak hour pass-by rate is applied to all uses to present a more conservative analysis.

Source: Fehr & Peers, 2013.

Table X
Shops at Broadway
Trip Generation Summary - Alternative 1A

		ITE		AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
Land Use	**Units[1]**	**Code**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Grocery Store	28.0 KSF	850 [2]	3,266	59	36	95	135	130	265	152	146	298
Restaurant	4.3 KSF	931 [3]	387	2	1	3	21	11	32	28	19	47
Retail	2.2 KSF	820 [4]	94	1	1	2	4	4	8	6	5	11
Apartment	150 DU	220 [5]	998	15	62	77	60	33	93	39	39	78
Total			*4,745*	*77*	*100*	*177*	*220*	*178*	*398*	*225*	*209*	*434*
Pass-by Reduction (Retail) [6]			-637	0	0	0	-52	-52	-104	-46	-46	-92
Non-Auto Mode Share Reduction (Residential) [7]			-210	-3	-13	-16	-13	-7	-20	-8	-8	-16
Net New Project Trips			**3,898**	**74**	**87**	**161**	**155**	**119**	**274**	**171**	**155**	**326**

1 KSF = 1,000 square feet. DU = Dwelling Unit.

2 ITE *Trip Generation (9th Edition)* land use category 850 (Grocery Store):

Daily: T = 66.95*(X) + 1391.56

AM Peak Hour: T = 3.40*(X) (62% in, 38% out)

PM Peak Hour: T = 9.48*(X) (51% in, 49% out)

Saturday Peak Hour: T = 10.65*(X) (51% in, 49% out)

3 *ITE Trip Generation (9th Edition)* land use category 931 (Quality Restaurant):

Daily: T = 89.95*(X)

AM Peak Hour: T = 0.81*(X) (82% in, 18% out)

PM Peak Hour: T = 7.49*(X) (67% in, 33% out)

Saturday Peak Hour: T = 10.82*(X) (59% in, 41% out)

4 *ITE Trip Generation (9th Edition)* land use category 820 (Shopping Center):

Daily: T = 42.70*(X)

AM Peak Hour: T = 0.96*(X) (62% in, 38% out)

PM Peak Hour: T = 3.71*(X) (48% in, 52% out)

Saturday Peak Hour: T = 4.82*(X) (52% in, 48% out)

5 *ITE Trip Generation (9th Edition)* land use category 220 (Apartment):

Daily: T = 6.65*(X)

AM Peak Hour: T = 0.51*(X) (20% in, 80% out)

PM Peak Hour: T = 0.62*(X) (65% in, 35% out)

Saturday Peak Hour: T = 0.52*(X) (50% in, 50% out)

6 Based on ITE *Trip Generation (9th Edition) User's Guide and Handbook,* the average weekday PM peak hour pass-by rates for land use categories 820, 850, 912, and 931 is 34%, 36%, 47%, and 44%, respectively. The average weekend peak pass-by rates for land use category 820 is 26%. A 17% daily pass-by rate, 34% PM peak hour pass-by rate, and 26% Saturday peak hour pass-by rate is applied to all uses to present a more conservative analysis.

7 Based on BATS 2000 data for locations between 0.5 and 1.0 miles from a BART/Amtrak Station, trip generation is reduced by 21%.

Source: Fehr & Peers, 2013.

Table X
Shops at Broadway
Trip Generation Summary - Alternative 1B

Land Use	Units[1]	ITE Code	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total
Grocery Store	26.0 KSF	850 [2]	3,132	55	33	88	125	121	246	141	136	277
Restaurant	4.3 KSF	931 [3]	387	2	1	3	21	11	32	28	19	47
Bank	3.0 KSF	912 [4]	444	21	15	36	37	36	73	40	39	79
Retail	2.1 KSF	820 [5]	90	1	1	2	4	4	8	5	5	10
Apartment	225 DU	220 [6]	1,496	23	92	115	91	49	140	59	58	117
Total			*5,549*	*102*	*142*	*244*	*278*	*221*	*499*	*273*	*257*	*530*
Pass-by Reduction (Retail) [7]			-689	0	0	0	-61	-61	-122	-53	-53	-106
Non-Auto Mode Share Reduction (Residential) [8]			-314	-5	-19	-24	-19	-10	-29	-12	-12	-25
Net New Project Trips			**4,546**	**97**	**123**	**220**	**198**	**150**	**348**	**208**	**192**	**399**

1 KSF = 1,000 square feet. DU = Dwelling Unit.

2 ITE *Trip Generation (9th Edition)* land use category 850 (Grocery Store):

Daily: T = 66.95*(X) + 1391.56

AM Peak Hour: T = 3.40*(X) (62% in, 38% out)

PM Peak Hour: T = 9.48*(X) (51% in, 49% out)

Saturday Peak Hour: T = 10.65*(X) (51% in, 49% out)

3 ITE Trip Generation (9th Edition) land use category 931 (Quality Restaurant):

Daily: T = 89.95*(X)

AM Peak Hour: T = 0.81*(X) (82% in, 18% out)

PM Peak Hour: T = 7.49*(X) (67% in, 33% out)

Saturday Peak Hour: T = 10.82*(X) (59% in, 41% out)

4 *ITE Trip Generation (9th Edition)* land use category 912 (Drive-in Bank):

Daily: T = 148.15*(X)

AM Peak Hour: T = 12.08*(X) (57% in, 43% out)

PM Peak Hour: T = 24.30*(X) (50% in, 50% out)

Saturday Peak Hour: T = 26.31*(X) (51% in, 49% out)

5 *ITE Trip Generation (9th Edition)* land use category 820 (Shopping Center):

Daily: T = 42.70*(X)

AM Peak Hour: T = 0.96*(X) (62% in, 38% out)

PM Peak Hour: T = 3.71*(X) (48% in, 52% out)

Saturday Peak Hour: T = 4.82*(X) (52% in, 48% out)

6 *ITE Trip Generation (9th Edition)* land use category 220 (Apartment):

Daily: T = 6.65*(X)

AM Peak Hour: T = 0.51*(X) (20% in, 80% out)

PM Peak Hour: T = 0.62*(X) (65% in, 35% out)

Saturday Peak Hour: T = 0.52*(X) (50% in, 50% out)

7 Based on ITE *Trip Generation (9th Edition) User's Guide and Handbook,* the average weekday PM peak hour pass-by rates for land use categories 820, 850, 912, and 931 is 34%, 36%, 47%, and 44%, respectively. The average weekend peak pass-by rates for land use category 820 is 26%. A 17% daily pass-by rate, 34% PM peak hour pass-by rate, and 26% Saturday peak hour pass-by rate is applied to all uses to present a more conservative analysis.

8 Based on BATS 2000 data for locations between 0.5 and 1.0 miles from a BART/Amtrak Station, trip generation is reduced by 21%.

Source: Fehr & Peers, 2013.

Table X
Shops at Broadway
Trip Generation Summary - Alternative 2

Land Use	Units[1]	ITE Code	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total
Restaurant	4.3 KSF	931 [2]	387	2	1	3	21	11	32	28	19	47
Bank	3.0 KSF	912 [3]	444	21	15	36	37	36	73	40	39	79
Retail	12.7 KSF	820 [4]	542	7	5	12	23	24	47	32	29	61
Apartment	225 DU	220 [5]	1,496	23	92	115	91	49	140	59	58	117
Total			*2,869*	*53*	*113*	*166*	*172*	*120*	*292*	*159*	*145*	*304*
Pass-by Reduction (Retail) [6]			-233	0	0	0	-26	-26	-52	-24	-24	-48
Non-Auto Mode Share Reduction (Residential) [7]			-314	-5	-19	-24	-19	-10	-29	-12	-12	-25
Net New Project Trips			**2,322**	**48**	**94**	**142**	**127**	**84**	**211**	**123**	**109**	**231**

1 KSF = 1,000 square feet. DU = Dwelling Unit.

2 *ITE Trip Generation (9th Edition)* land use category 931 (Quality Restaurant):

Daily: T = 89.95*(X)

AM Peak Hour: T = 0.81*(X) (82% in, 18% out)

PM Peak Hour: T = 7.49*(X) (67% in, 33% out)

Saturday Peak Hour: T = 10.82*(X) (59% in, 41% out)

3 *ITE Trip Generation (9th Edition)* land use category 912 (Drive-in Bank):

Daily: T = 148.15*(X)

AM Peak Hour: T = 12.08*(X) (57% in, 43% out)

PM Peak Hour: T = 24.30*(X) (50% in, 50% out)

Saturday Peak Hour: T = 26.31*(X) (51% in, 49% out)

4 *ITE Trip Generation (9th Edition)* land use category 820 (Shopping Center):

Daily: T = 42.70*(X)

AM Peak Hour: T = 0.96*(X) (62% in, 38% out)

PM Peak Hour: T = 3.71*(X) (48% in, 52% out)

Saturday Peak Hour: T = 4.82*(X) (52% in, 48% out)

5 *ITE Trip Generation (9th Edition)* land use category 220 (Apartment):

Daily: T = 6.65*(X)

AM Peak Hour: T = 0.51*(X) (20% in, 80% out)

PM Peak Hour: T = 0.62*(X) (65% in, 35% out)

Saturday Peak Hour: T = 0.52*(X) (50% in, 50% out)

6 Based on ITE *Trip Generation (9th Edition) User's Guide and Handbook,* the average weekday PM peak hour pass-by rates for land use categories 820, 850, 912, and 931 is 34%, 36%, 47%, and 44%, respectively. The average weekend peak pass-by rates for land use category 820 is 26%. A 17% daily pass-by rate, 34% PM peak hour pass-by rate, and 26% Saturday peak hour pass-by rate is applied to all uses to present a more conservative analysis.

7 Based on BATS 2000 data for locations between 0.5 and 1.0 miles from a BART/Amtrak Station, trip generation is reduced by 21%.

Source: Fehr & Peers, 2013.

Table X
Shops at Broadway
Trip Generation Summary - Alternative 3

Land Use	Units[1]	ITE Code	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total
Restaurant	4.3 KSF	931 [2]	387	2	1	3	21	11	32	28	19	47
Bank	3.0 KSF	912 [3]	444	21	15	36	37	36	73	40	39	79
Retail	2.7 KSF	820 [4]	115	2	1	3	5	5	10	7	6	13
Office	100 KSF	220 [5]	1,103	137	19	156	25	124	149	23	20	43
Total			*2,049*	*162*	*36*	*198*	*88*	*176*	*264*	*98*	*84*	*182*
Pass-by Reduction (Retail) [6]			-161	0	0	0	-19	-19	-38	-18	-18	-36
Non-Auto Mode Share Reduction (Office) [7]			-232	-29	-4	-33	-5	-26	-31	-5	-4	-9
Net New Project Trips			**1,656**	**133**	**32**	**165**	**64**	**131**	**195**	**75**	**62**	**137**

1 KSF = 1,000 square feet.

2 *ITE Trip Generation (9th Edition)* land use category 931 (Quality Restaurant):

Daily: T = 89.95*(X)

AM Peak Hour: T = 0.81*(X) (82% in, 18% out)

PM Peak Hour: T = 7.49*(X) (67% in, 33% out)

Saturday Peak Hour: T = 10.82*(X) (59% in, 41% out)

3 *ITE Trip Generation (9th Edition)* land use category 912 (Drive-in Bank):

Daily: T = 148.15*(X)

AM Peak Hour: T = 12.08*(X) (57% in, 43% out)

PM Peak Hour: T = 24.30*(X) (50% in, 50% out)

Saturday Peak Hour: T = 26.31*(X) (51% in, 49% out)

4 *ITE Trip Generation (9th Edition)* land use category 820 (Shopping Center):

Daily: T = 42.70*(X)

AM Peak Hour: T = 0.96*(X) (62% in, 38% out)

PM Peak Hour: T = 3.71*(X) (48% in, 52% out)

Saturday Peak Hour: T = 4.82*(X) (52% in, 48% out)

5 *ITE Trip Generation (9th Edition)* land use category 710 (General Office):

Daily: T = 11.03*(X)

AM Peak Hour: T = 1.56*(X) (88% in, 12% out)

PM Peak Hour: T = 1.49*(X) (17% in, 83% out)

Saturday Peak Hour: T = 0.43*(X) (54% in, 56% out)

6 Based on ITE *Trip Generation (9th Edition) User's Guide and Handbook,* the average weekday PM peak hour pass-by rates for land use categories 820, 850, 912, and 931 is 34%, 36%, 47%, and 44%, respectively. The average weekend peak pass-by rates for land use category 820 is 26%. A 17% daily pass-by rate, 34% PM peak hour pass-by rate, and 26% Saturday peak hour pass-by rate is applied to all uses to present a more conservative analysis.

7 Based on BATS 2000 data for locations between 0.5 and 1.0 miles from a BART/Amtrak Station, trip generation is reduced by 21%.

Source: Fehr & Peers, 2013.

Table X
Shops at Broadway
Trip Generation Summary - Alternative 4

Land Use	Units[1]	ITE Code	Daily	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total
Grocery Store	20.0	850 [2]	2,731	42	26	68	97	93	190	109	104	213
Total			2,731	42	26	68	97	93	190	109	104	213
Pass-by Reduction [3]			-463	0	0	0	-33	-32	-65	-28	-28	-55
Net New Project Trips			**2,268**	**42**	**26**	**68**	**64**	**61**	**44**	**81**	**76**	**157**

1 KSF = 1,000 square feet.

2 ITE *Trip Generation (9th Edition)* land use category 850 (Grocery Store):

Daily: T = 66.95*(X) + 1391.56

AM Peak Hour: T = 3.40*(X) (62% in, 38% out)

PM Peak Hour: T = 9.48*(X) (51% in, 49% out)

Saturday Peak Hour: T = 10.65*(X) (51% in, 49% out)

3 Based on ITE *Trip Generation (9th Edition) User's Guide and Handbook,* the average weekday PM peak hour pass-by rates for land use categories 820, 850, 912, and 931 is 34%, 36%, 47%, and 44%, respectively. The average weekend peak pass-by rates for land use category 820 is 26%. A 17% daily pass-by rate, 34% PM peak hour pass-by rate, and 26% Saturday peak hour pass-by rate is applied to all uses to present a more conservative analysis.

Source: Fehr & Peers, 2013.

The Shops at Broadway Project DEIR

ALTERNATIVES SERVICE POPULATION

1A

	sf or hh		rate/ksf or HH	
grocery	28,000	28.0	2.15	60
restaurant	4,300	4.3	2.0	9
retail	2,200	2.2	2.0	4
units 150	144	144.0	1.87	269
				342

1B

	sf or hh		rate/ksf or HH	
grocery	26,000	26.0	2.15	56
restaurant	4,300	4.3	2.0	9
retail	2,100	2.1	2.0	4
bank	3,000	3.0	2.0	6
units 225	216	216.0	1.87	404
				479

2

	sf or hh		rate/ksf or HH	
restaurant	4,300	4.3	2.0	9
retail	12,700	12.7	2.0	25
bank	3,000	3.0	2.0	6
units 225	216	216.0	1.87	404
				444

3

	sf or hh		rate/ksf	
restaurant	4,300	4.3	2.0	9
retail	2,700	2.7	2.0	5
bank	3,000	3.0	2.0	6
office	100,000	100.0	3.3	330
				350

4

	sf		rate/ksf	
grocery	20,000	20.0	2.15	43
				43

GHG EMISSIONS INVENTORY ALT 1A – MIXED USE 150 ADJUSTED[a]

	Total Regulatory and City Program Adjusted Annual CO_2e Emissions (metric tons per year)
Emission Source	
Motor vehicle trips	1,842
Natural gas	157
Grid Electricity	311
Wastewater & Treatment & Conveyance	23
Solid Waste	128
Area Source (landscape maintenance)	30
Refrigerant Leakage	106
Total Operational Project GHG Emissions without Construction Emissions	2,597
Construction Emissions per Year (annualized over 40 years)	19
Total Operational Project GHG Emissions with Construction Emissions	**2,616**
Project- and Plan-level Threshold of Significance	*1,100*
Exceeds Threshold?	***Yes***
Total Project GHG Emissions by Service Population (342 population & employee increase) including Construction Emissions[c]	***7.6***
Project-level Threshold of Significance	*4.6*
Exceeds Project-level Threshold?	***Yes***

[a] Adjusted emissions reductions reflect AB 32 Scoping Plan Measures for energy efficiency that result in improved PG&E emission factors and applicant-specific natural gas and water demand for supermarket land use.

NOTE: See Table 4.6-3 in Section 4.6, *Greenhouse Gases and Climate Change,* for other applicable notes.

GHG EMISSIONS INVENTORY ALT 1B – MIXED USE 225 ADJUSTED[a]

	Total Regulatory and City Program Adjusted Annual CO_2e Emissions (metric tons per year)
Emission Source	
Motor vehicle trips	2,300
Natural gas	197
Grid Electricity	347
Wastewater & Treatment & Conveyance	33
Solid Waste	129
Area Source (landscape maintenance)	46
Refrigerant Leakage	106
Total Operational Project GHG Emissions without Construction Emissions	3,167
Construction Emissions per Year (annualized over 40 years)	23
Total Operational Project GHG Emissions with Construction Emissions	**3,190**
Project- and Plan-level Threshold of Significance	*1,100*
Exceeds Threshold?	***Yes***

Total Project GHG Emissions by Service Population (479 population & employee increase) including Construction Emissions[c]	***6.7***
Project-level Threshold of Significance	*4.6*
Exceeds Project-level Threshold?	***Yes***

[a] Adjusted emissions reductions reflect AB 32 Scoping Plan Measures for energy efficiency that result in improved PG&E emission factors and applicant-specific natural gas and water demand for supermarket land use.
NOTE: See Table 4.6-3 in Section 4.6, *Greenhouse Gases and Climate Change,* for other applicable notes.

GHG EMISSIONS INVENTORY ALT 2 – MIXED USE 225/ NO GROCERY ADJUSTED[a]

	Total Regulatory and City Program Adjusted Annual CO_2e Emissions (metric tons per year)
Emission Source	
Motor vehicle trips	1,956
Natural gas	163
Grid Electricity	189
Wastewater & Treatment & Conveyance	32
Solid Waste	78
Area Source (landscape maintenance)	46
Total Operational Project GHG Emissions without Construction Emissions	2,483
Construction Emissions per Year (annualized over 40 years)	22
Total Operational Project GHG Emissions with Construction Emissions	**2,505**
Project- and Plan-level Threshold of Significance	*1,100*
Exceeds Threshold?	***Yes***

Total Project GHG Emissions by Service Population (444 population & employee increase) including Construction Emissions[c]	***5.6***
Project-level Threshold of Significance	*4.6*
Exceeds Project-level Threshold?	***Yes***

[a] Adjusted emissions reductions reflect AB 32 Scoping Plan Measures for energy efficiency that result in improved PG&E emission factors and applicant-specific natural gas and water demand for supermarket land use.
NOTE: See Table 4.6-3 in Section 4.6, *Greenhouse Gases and Climate Change,* for other applicable notes.

GHG EMISSIONS INVENTORY ALT 3 – OFFICE ADJUSTED[a]

	Total Regulatory and City Program Adjusted Annual CO_2e Emissions (metric tons per year)
Emission Source	
Motor vehicle trips	1,178
Natural gas	141
Grid Electricity	273
Wastewater & Treatment & Conveyance	36
Solid Waste	68
Area Source (landscape maintenance)	0
Total Operational Project GHG Emissions without Construction Emissions	1,696

Construction Emissions per Year (annualized over 40 years)	12
Total Operational Project GHG Emissions with Construction Emissions	**1,708**
Project- and Plan-level Threshold of Significance	*1,100*
Exceeds Threshold?	***Yes***

Total Project GHG Emissions by Service Population (350 employee increase) including Construction Emissions[c]	***4.9***
Project-level Threshold of Significance	*4.6*
Exceeds Project-level Threshold?	***Yes***

[a] Adjusted emissions reductions reflect AB 32 Scoping Plan Measures for energy efficiency that result in improved PG&E emission factors and applicant-specific natural gas and water demand for supermarket land use.
NOTE: See Table 4.6-3 in Section 4.6, *Greenhouse Gases and Climate Change,* for other applicable notes.

GHG EMISSIONS INVENTORY ALT 4 – FULLY MITIGATED / GROCERY ONLY ADJUSTED[a]

	Total Regulatory and City Program Adjusted Annual CO_2e Emissions (metric tons per year)
Emission Source	
Motor vehicle trips	738
Natural gas	28
Grid Electricity	138
Wastewater & Treatment & Conveyance	3
Solid Waste	51
Area Source (landscape maintenance)	0
Fugitive Refrigerants	106
Total Operational Project GHG Emissions without Construction Emissions	1,064
Construction Emissions per Year (annualized over 40 years)	3
Total Operational Project GHG Emissions with Construction Emissions	**1,067**
Project- and Plan-level Threshold of Significance	*1,100*
Exceeds Threshold?	***No***

Total Project GHG Emissions by Service Population (43 employee increase) including Construction Emissions	***24.8***
Project-level Threshold of Significance	*4.6*
Exceeds Project-level Threshold?	***Yes***

[a] Adjusted emissions reductions reflect AB 32 Scoping Plan Measures for energy efficiency that result in improved PG&E emission factors and applicant-specific natural gas and water demand for supermarket land use.
NOTE: See Table 4.6-3 in Section 4.6, *Greenhouse Gases and Climate Change,* for other applicable notes.

Shops Alt 1a

Alameda County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
High Turnover (Sit Down Restaurant)	4.3	1000sqft
Apartments Mid Rise	150	Dwelling Unit
Strip Mall	2.2	1000sqft
Supermarket	28	1000sqft

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Utility Company**	Pacific Gas & Electric Company
Climate Zone	5	**Precipitation Freq (Days)**	63		

1.3 User Entered Comments

Project Characteristics - Adjust CO2 factor to match PG&E projection for 2015
This run operational only. Neglect construction emisions this run.

Land Use - All default values in land use

Vehicle Trips - Adjust trip rates and C-C trip length to match transportation analysis.

Woodstoves - Assume no woodstoves. Default percentage of fireplace units but all gas.

Area Coating - Adjust ROF emission factor to match upper end of GBC

Energy Use - Adjust Nat gas to match applicant demand from other store

Water And Wastewater - Adjust water use to match demand at existing market

Area Mitigation -

Energy Mitigation -

Water Mitigation -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2011	11.17	89.92	52.14	0.08	18.34	4.62	22.95	9.94	4.62	14.56	0.00	8,201.79	0.00	1.00	0.00	8,222.84
2012	305.62	42.45	36.21	0.06	1.99	2.72	4.70	0.08	2.72	2.80	0.00	5,958.47	0.00	0.62	0.00	5,971.43
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2011	11.17	89.92	52.14	0.08	18.08	4.62	22.69	9.94	4.62	14.56	0.00	8,201.79	0.00	1.00	0.00	8,222.84
2012	305.62	42.45	36.21	0.06	0.08	2.72	2.80	0.08	2.72	2.80	0.00	5,958.47	0.00	0.62	0.00	5,971.43
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.36	0.15	12.77	0.00		0.00	0.14		0.00	0.14	0.00	1,097.26		0.04	0.02	1,104.29
Energy	0.09	0.81	0.52	0.01		0.00	0.06		0.00	0.06		1,005.78		0.02	0.02	1,011.90
Mobile	12.02	26.09	96.98	0.11	12.17	0.75	12.92	0.42	0.75	1.17		11,022.65		0.55		11,034.13
Total	**17.47**	**27.05**	**110.27**	**0.12**	**12.17**	**0.75**	**13.12**	**0.42**	**0.75**	**1.37**	**0.00**	**13,125.69**		**0.61**	**0.04**	**13,150.32**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.36	0.15	12.77	0.00		0.00	0.14		0.00	0.14	0.00	1,097.26		0.04	0.02	1,104.29
Energy	0.09	0.76	0.49	0.00		0.00	0.06		0.00	0.06		940.68		0.02	0.02	946.41
Mobile	12.02	26.09	96.98	0.11	12.17	0.75	12.92	0.42	0.75	1.17		11,022.65		0.55		11,034.13
Total	**17.47**	**27.00**	**110.24**	**0.11**	**12.17**	**0.75**	**13.12**	**0.42**	**0.75**	**1.37**	**0.00**	**13,060.59**		**0.61**	**0.04**	**13,084.83**

3.0 Construction Detail

Shops Alt 1B

Alameda County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Bank (with Drive-Through)	3	1000sqft
High Turnover (Sit Down Restaurant)	4.3	1000sqft
Apartments Mid Rise	225	Dwelling Unit
Strip Mall	2.1	1000sqft
Supermarket	26	1000sqft

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Utility Company**	Pacific Gas & Electric Company
Climate Zone	5	**Precipitation Freq (Days)**	63		

1.3 User Entered Comments

Project Characteristics - Adjust CO2 factor to match PG&E projection for 2015
This run operational only. Neglect construction emisions this run.

Land Use - All default values in land use

Vehicle Trips - Adjust trip rates and C-C trip length to match transportation analysis.

Woodstoves - Assume no woodstoves. Default percentage of fireplace units but all gas.

Area Coating - Adjust ROF emission factor to match upper end of GBC

Energy Use - Adjust Nat gas to match applicant demand from other store

Water And Wastewater - Adjust water use to match demand at existing market

Area Mitigation -

Energy Mitigation -

Water Mitigation -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

<u>Unmitigated Construction</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2011	11.17	89.92	52.14	0.08	18.34	4.62	22.95	9.94	4.62	14.56	0.00	8,201.79	0.00	1.00	0.00	8,222.84
2012	393.50	44.41	41.74	0.07	2.88	3.13	5.67	0.12	3.13	3.14	0.00	6,786.04	0.00	0.67	0.00	6,800.04
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

<u>Mitigated Construction</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2011	11.17	89.92	52.14	0.08	18.08	4.62	22.69	9.94	4.62	14.56	0.00	8,201.79	0.00	1.00	0.00	8,222.84
2012	393.50	44.41	41.74	0.07	0.12	3.13	3.14	0.12	3.13	3.14	0.00	6,786.04	0.00	0.67	0.00	6,800.04
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.2 Overall Operational

<u>Unmitigated Operational</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	7.62	0.22	19.15	0.00		0.00	0.20		0.00	0.20	0.00	1,645.89		0.07	0.03	1,656.44
Energy	0.12	1.02	0.61	0.01		0.00	0.08		0.00	0.08		1,269.94		0.02	0.02	1,277.67
Mobile	14.49	31.81	117.28	0.14	15.29	0.92	16.22	0.53	0.92	1.46		13,760.92		0.67		13,775.00
Total	**22.23**	**33.05**	**137.04**	**0.15**	**15.29**	**0.92**	**16.50**	**0.53**	**0.92**	**1.74**	**0.00**	**16,676.75**		**0.76**	**0.05**	**16,709.11**

<u>Mitigated Operational</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	7.62	0.22	19.15	0.00		0.00	0.20		0.00	0.20	0.00	1,645.89		0.07	0.03	1,656.44
Energy	0.11	0.95	0.57	0.01		0.00	0.07		0.00	0.07		1,183.30		0.02	0.02	1,190.50
Mobile	14.49	31.81	117.28	0.14	15.29	0.92	16.22	0.53	0.92	1.46		13,760.92		0.67		13,775.00
Total	**22.22**	**32.98**	**137.00**	**0.15**	**15.29**	**0.92**	**16.49**	**0.53**	**0.92**	**1.73**	**0.00**	**16,590.11**		**0.76**	**0.05**	**16,621.94**

3.0 Construction Detail

Shops Alt 2

Alameda County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Bank (with Drive-Through)	3	1000sqft
High Turnover (Sit Down Restaurant)	4.3	1000sqft
Apartments Mid Rise	225	Dwelling Unit
Strip Mall	12.7	1000sqft

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Utility Company** Pacific Gas & Electric Company

Climate Zone 5 **Precipitation Freq (Days)** 63

1.3 User Entered Comments

Project Characteristics - Adjust CO2 factor to match PG&E projection for 2015
This run operational only. Neglect construction emisions this run.

Land Use - All default values in land use

Vehicle Trips - Adjust trip rates and C-C trip length to match transportation analysis.

Woodstoves - Assume no woodstoves. Default percentage of fireplace units but all gas.

Area Coating - Adjust ROF emission factor to match upper end of GBC

Energy Use - energy all defaults thi srun

Water And Wastewater - water all defaults this run

Area Mitigation -

Energy Mitigation -

Water Mitigation -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2011	11.17	89.92	52.14	0.08	18.34	4.62	22.95	9.94	4.62	14.56	0.00	8,201.79	0.00	1.00	0.00	8,222.84
2012	375.66	43.82	40.99	0.07	2.78	3.13	5.55	0.11	3.13	3.14	0.00	6,649.13	0.00	0.66	0.00	6,662.99
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2011	11.17	89.92	52.14	0.08	18.08	4.62	22.69	9.94	4.62	14.56	0.00	8,201.79	0.00	1.00	0.00	8,222.84
2012	375.66	43.82	40.99	0.07	0.11	3.13	3.14	0.11	3.13	3.14	0.00	6,649.13	0.00	0.66	0.00	6,662.99
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	7.24	0.22	19.15	0.00		0.00	0.20		0.00	0.20	0.00	1,645.89		0.07	0.03	1,656.44
Energy	0.10	0.84	0.45	0.01		0.00	0.07		0.00	0.07		1,052.53		0.02	0.02	1,058.93
Mobile	8.64	19.90	70.88	0.09	10.70	0.61	11.32	0.37	0.61	0.99		9,411.80		0.43		9,420.80
Total	**15.98**	**20.96**	**90.48**	**0.10**	**10.70**	**0.61**	**11.59**	**0.37**	**0.61**	**1.26**	**0.00**	**12,110.22**		**0.52**	**0.05**	**12,136.17**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	7.24	0.22	19.15	0.00		0.00	0.20		0.00	0.20	0.00	1,645.89		0.07	0.03	1,656.44
Energy	0.09	0.78	0.43	0.00		0.00	0.06		0.00	0.06		980.33		0.02	0.02	986.29
Mobile	8.64	19.90	70.88	0.09	10.70	0.61	11.32	0.37	0.61	0.99		9,411.80		0.43		9,420.80
Total	**15.97**	**20.90**	**90.46**	**0.09**	**10.70**	**0.61**	**11.58**	**0.37**	**0.61**	**1.25**	**0.00**	**12,038.02**		**0.52**	**0.05**	**12,063.53**

3.0 Construction Detail

Shops Alt 3

Alameda County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Bank (with Drive-Through)	3	1000sqft
General Office Building	100	1000sqft
High Turnover (Sit Down Restaurant)	4.3	1000sqft
Strip Mall	2.7	1000sqft

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Utility Company**	Pacific Gas & Electric Company
Climate Zone	5	**Precipitation Freq (Days)**	63		

1.3 User Entered Comments

Project Characteristics - Adjust CO2 factor to match PG&E projection for 2015
This run operational only. Neglect construction emisions this run.

Land Use - All default values in land use

Vehicle Trips - Adjust trip rates and C-C trip length to match transportation analysis.

Woodstoves - Assume no woodstoves. Default percentage of fireplace units but all gas.

Area Coating - Adjust ROF emission factor to match upper end of GBC

Energy Use - energy all defaults thi srun

Water And Wastewater - water all defaults this run

Area Mitigation -

Energy Mitigation -

Water Mitigation -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2011	255.34	43.56	26.75	0.04	6.70	2.72	9.00	3.32	2.72	5.61	0.00	4,129.44	0.00	0.60	0.00	4,141.95
2012	255.29	3.23	2.56	0.00	0.10	0.29	0.40	0.00	0.29	0.30	0.00	358.88	0.00	0.05	0.00	359.99
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2011	255.34	43.56	26.75	0.04	6.56	2.72	8.85	3.32	2.72	5.61	0.00	4,129.44	0.00	0.60	0.00	4,141.95
2012	255.29	3.23	2.56	0.00	0.00	0.29	0.30	0.00	0.29	0.30	0.00	358.88	0.00	0.05	0.00	359.99
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.2 Overall Operational

Unmitigated Operational

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Area	2.77	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.08	0.77	0.64	0.00		0.00	0.06		0.00	0.06		918.63		0.02	0.02	924.22
Mobile	6.34	14.71	52.11	0.07	8.04	0.46	8.50	0.28	0.46	0.74		7,051.21		0.32		7,057.89
Total	**9.19**	**15.48**	**52.75**	**0.07**	**8.04**	**0.46**	**8.56**	**0.28**	**0.46**	**0.80**		**7,969.84**		**0.34**	**0.02**	**7,982.11**

Mitigated Operational

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Area	2.77	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.08	0.71	0.59	0.00		0.00	0.05		0.00	0.05		848.49		0.02	0.02	853.66
Mobile	6.34	14.71	52.11	0.07	8.04	0.46	8.50	0.28	0.46	0.74		7,051.21		0.32		7,057.89
Total	**9.19**	**15.42**	**52.70**	**0.07**	**8.04**	**0.46**	**8.55**	**0.28**	**0.46**	**0.79**		**7,899.70**		**0.34**	**0.02**	**7,911.55**

3.0 Construction Detail

Shops Alt 4

Alameda County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Supermarket	20	1000sqft

1.2 Other Project Characteristics

Urbanization Urban

Wind Speed (m/s) 2.2

Utility Company Pacific Gas & Electric Company

Climate Zone 5

Precipitation Freq (Days) 63

1.3 User Entered Comments

Project Characteristics - Adjust CO2 factor to match PG&E projection for 2015
This run operational only. Neglect construction emisions this run.

Land Use - All default values in land use

Vehicle Trips - Adjust trip rates and C-C trip length to match transportation analysis.

Woodstoves - Assume no woodstoves. Default percentage of fireplace units but all gas.

Area Coating - Adjust ROF emission factor to match upper end of GBC

Energy Use - Natural gas demand adjusted to match Applicant data

Water And Wastewater - water demad adjusted to match applicant data

Area Mitigation -

Energy Mitigation -

Water Mitigation -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2011	93.19	19.76	11.90	0.02	0.90	1.40	2.15	0.42	1.40	1.67	0.00	2,094.79	0.00	0.25	0.00	2,100.07
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2011	93.19	19.76	11.90	0.02	0.76	1.40	2.01	0.42	1.40	1.67	0.00	2,094.79	0.00	0.25	0.00	2,100.07
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.50	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.02	0.15	0.13	0.00		0.00	0.01		0.00	0.01		179.85		0.00	0.00	180.95
Mobile	5.96	12.11	47.20	0.04	4.65	0.31	4.97	0.16	0.31	0.48		4,412.82		0.25		4,417.98
Total	**6.48**	**12.26**	**47.33**	**0.04**	**4.65**	**0.31**	**4.98**	**0.16**	**0.31**	**0.49**		**4,592.67**		**0.25**	**0.00**	**4,598.93**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.50	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.02	0.14	0.12	0.00		0.00	0.01		0.00	0.01		167.67		0.00	0.00	168.69
Mobile	5.96	12.11	47.20	0.04	4.65	0.31	4.97	0.16	0.31	0.48		4,412.82		0.25		4,417.98
Total	**6.48**	**12.25**	**47.32**	**0.04**	**4.65**	**0.31**	**4.98**	**0.16**	**0.31**	**0.49**		**4,580.49**		**0.25**	**0.00**	**4,586.67**

3.0 Construction Detail