ATTACHMENT A:

1. Arcadia Park EIR available to the public at https://www.oaklandca.gov/resources/completed-environmental-review-ceqa-eir-documents
2. Madison Park 98th Avenue CEQA Analysis Addendum
   - A. Standard Conditions of Approval and Mitigation Monitoring and Reporting Program
   - B. Criteria for Use of Addendum, per CEQA Guidelines Sections 15162, 15164, and 15168
   - C. Project Consistency with Community Plan or Zoning, per CEQA Guidelines Section 15183
   - D. Infill Performance Standards, per CEQA Guidelines Section 15183.3
   - E. Air Quality and Health Risk Screening Analysis; CalEEMod
   - F. Traffic Noise Outputs
3. Non-CEQA Transportation Assessment Memo
4. Transportation and Parking Demand Management Memo

Madison Park 98th Avenue
CEQA ANALYSIS

City of Oakland
Bureau of Planning
250 Frank H. Ogawa Plaza, Suite 2114
Oakland, CA 94612

December 2020

URBAN PLANNING PARTNERS INC.

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I. EXECUTIVE SUMMARY

The purpose of this CEQA document is to analyze the Madison Park 98th Avenue Project (2019 project) to determine if it qualifies for an Addendum and/or other streamlining provisions (Streamlining for Infill Projects, Projects Consistent with a Community Plan or Zoning), so that no additional environmental review is required.

This section provides a summary describing the project, the findings of the analysis included in this CEQA document, and the document's organization.

A. Project Overview

Madison Park, the project applicant, is proposing to develop two parcels in the Elmhurst Park area of East Oakland. The 2019 project would involve the construction of several structures between three and five stories in height, containing a mixture of apartments and attached townhomes with a total of approximately 399 residential units (approximately 581,146 square feet), 2,468 square feet of ground floor retail space, and 11,688 square feet of work/live area (9 work/live units). Various infrastructure improvements including new streets, sidewalks, sewers, and storm drains are also proposed as part of the 2019 project to serve the new buildings. Table 1 provides general project information.

TABLE 1 GENERAL PROJECT INFORMATION

Project Title	Madison Park 98th Avenue Project
Public Case File Number	PLN180523
Lead Agency Name and Address	City of Oakland Bureau of Planning 250 Frank H. Ogawa Plaza, Suite 2114 Oakland, CA 94612
Staff Contact	Dara O'Byrne, City Planner (510) 238-6983 dobyrne@oaklandca.gov
Applicant	Madison Park 155 Grand Avenue, Suite 950 Oakland, CA 94612 Contact: Claire Han
Project Location/Assessor's Parcel Numbers	921 98th Avenue and 999 98th Avenue; APNs: 44-5080-180 and 44-5080-179
General Designation	Housing and Business Mix
Zoning Designation	HBX-1, Housing and Business Mix 1
Lot Size	10.16 acres (442,554 square feet)

The 2019 project site is comprised of two parcels totaling 10.16 acres, inclusive of existing right of way. It is in the southwest corner of the 27.5-acre Arcadia Park project site and was planned to be the site of the final phase of the Arcadia Park project, which was evaluated in the Arcadia Park EIR but was never developed. On September 21, 2005, the City of Oakland certified the Final Arcadia Park Residential Project Environmental Impact Report (Arcadia Park EIR), [1] pursuant to the California Environmental Quality Act (CEQA). The project evaluated in the Arcadia Park EIR (Arcadia Park project) included development across 27.5 acres (including the 10.16-acre project site that is the subject of this CEQA document), containing 366 residential units (74 single-family units, 108 detached condominium units, 184 townhomes), 732 covered, off-street parking spaces, 235 on-street parking spaces, 1.6 acres of landscaped open space, and 6.4 acres of new streets and emergency vehicle access.

In 2007, Pulte Homes, the developer of the Arcadia Park project, revised their plans to exclude the current project site from their development plans. The EIR evaluating the environmental impacts of development on this site was not affected by this revision (see discussion in section II. Background. The revisions to the Planned Unit Development (PUD) in 2011 indicate that only 168 of the 366 homes originally proposed for the Arcadia Park project were completed and the subject 10.16 acres were left undeveloped. The modification to the Arcadia Park project did not affect the adequacy or relevancy of the Arcadia Park EIR.

B. Summary

As demonstrated in (1) the project findings, detailed in the Environmental Checklist found below; (2) the Criteria for Use of Addendum, included in Attachment B; and (3) the Infill Performance Standards Matrix, included as Attachment D, the Madison Park 98th Avenue 2019 Project would not result in substantially more significant (severe) environmental effects than those identified in the Arcadia Park EIR. The CEQA Guidelines specify that "more significant" effects include those that result from changes in circumstances or changes in the development assumptions underlying the prior EIR's analysis. Where project-specific significant environmental impacts could occur, this document demonstrates that they would be substantially mitigated by mitigation measures from the Arcadia Park EIR and/or uniformly applicable development policies or standards.

Therefore, the 2019 project qualifies for an Addendum, an Eligible Infill Exemption, and a Community Plan Exemption (under the LUTE EIR), and no additional environmental review is required under CEQA Guidelines Section 15162, 15164, 15168, 15183, and 15183.3

[1] City of Oakland, 2005. Arcadia Park Residential Project, Final EIR. Prepared by CirclePoint. February 18.

C. Document Organization

This CEQA Analysis is organized into the following chapters:

Chapter I, Executive Summary: This chapter provides a summary of the 2019 project and its findings; and summarizes the organization of the CEQA Analysis.

Chapter II, Background: This chapter summarizes the previous environmental documents and their impacts that this CEQA Analysis is based upon.

Chapter III, Project Description: This chapter describes the 2019 project site, site development history, proposed development, and required approval process.

Chapter IV, Summary of Findings: This chapter describes why the 2019 project qualifies for an Exemption/Addendum under applicable CEQA provisions and describes several CEQA streamlining and/or tiering provisions and CEQA exemptions under which the 2019 project qualifies.

Chapter V, CEQA Checklist: This chapter summarizes the analysis, findings, and conclusions of previous Oakland Program EIRs as follows: Oakland's 1998 General Plan Land Use and Transportation Element EIR (1998 LUTE EIR), the 2010 General Plan Housing Element Update EIR, and its 2014 Addendum (2010 Housing Element EIR and 2014 Addendum). These are referred to collectively throughout this document as the Program EIRs. This chapter also provides analysis for each environmental technical topic and describes significance criteria, potential environmental impacts, and their level of significance, SCAs relied upon to ensure that significant impacts would not occur, and mitigation measures recommended when necessary to mitigate identified impacts.

Appendices: The appendices include all the applicable SCAs, consistency with applicable CEQA streamlining guidelines, and the technical analyses and data for air quality, greenhouse gas emissions, noise, and transportation and circulation.

II. BACKGROUND

This section provides a brief summary of the previous 2005 Arcadia Park EIR, as well as a brief summary of applicable Program EIRs.

A. Arcadia Park Residential Project EIR

In 2007, Pulte Homes, the developer of the Arcadia Park project, revised their plans to exclude the current project site from their development plans. As described above in *Chapter I, Executive Summary*, the City certified the Final Arcadia Park Residential Development Project Environmental Impact Report (Arcadia Park EIR) [2] on September 21, 2005. The project evaluated in the Arcadia Park EIR included:

- 366 total residential units.[3]
  - 74 single-family units
  - 108 detached condominium units
  - 184 townhomes
- 732 covered, off-street parking spaces.
- 235 on-street parking spaces.
- 1.6 acres of landscaped open space.
- 6.4 acres of new streets and emergency vehicle access.
- 27.5-acre site (including the 10.16-acre project site that is the subject of this CEQA document)

The Initial Study conducted prior to the Arcadia Park EIR found that the Arcadia Park project would not result in significant and unavoidable impacts related to aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, hydrology and water quality, mineral resources, population and housing, public services, recreation, or utilities.

Potentially significant impacts related to traffic, noise, hazards and hazardous materials, and land use were studied further in the Arcadia Park EIR, which found all impacts related to these topics would be mitigated to less-than-significant level, with the exception of significant and unavoidable impacts related to transportation and traffic. The Arcadia Park EIR identified eight significant impacts, including impacts at the International Boulevard/92nd Avenue, easternmost project driveway (Armstrong Drive)/98th Avenue, San Leandro Street/98th Avenue, and International Boulevard/98th Avenue intersections.

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[2] City of Oakland, 2005. Arcadia Park Residential Project, Final EIR. Prepared by CirclePoint. February 18.

[3] The project was originally approved with 366 units. Subsequent to the original approval, the Director of City Planning administratively approved a reduction in the number of residential units from 366 to 365.

The Arcadia Park EIR identified significant impacts related to the design of the internal intersections within the project site and impacts during the construction period. The Arcadia Park EIR also identified various mitigation measures to reduce most of the significant impacts to less than significant levels. However, the impacts at the International Boulevard/92nd Avenue, San Leandro Street/98th Avenue, and International Boulevard/98th Avenue intersections were identified as significant and unavoidable in the Arcadia Park EIR.

During the time that the Arcadia Park EIR was prepared and approved, Level of Service (LOS) was used to analyze transportation impacts. On September 21, 2016, the City of Oakland's Planning Commission directed staff to update the City of Oakland's CEQA Thresholds of Significance Guidelines related to transportation impacts in order to implement the directive from Senate Bill 743 to modify local environmental review processes by removing automobile delay, as described solely by LOS or similar measures of vehicular capacity or traffic congestion, as a significant impact on the environment pursuant to CEQA. The Planning Commission direction aligns with draft proposed guidance from the Governor's Office of Planning and Research and the City's approach to transportation impact analysis with adopted plans and policies related to transportation, which promote the reduction of greenhouse gas (GHG) emissions, the development of multimodal transportation networks, and a diversity of land uses. While the Arcadia Park EIR considered LOS, the 2019 project uses a different threshold to measure transportation impacts, vehicles miles traveled (VMT), in *Chapter V, CEQA Checklist, Section M, Transportation and Circulation.*

The Arcadia Park EIR studied three alternatives to the Arcadia Park project: 1) No Project; 2) New Industrial/Retail Project; and 3) Reduced Density. The EIR found that the No Project alternative would avoid the significant traffic impacts but would not meet any of the Arcadia Park project's objectives. Furthermore, under the No Project scenario, the hazardous materials on the Arcadia Park project site would not have been remediated. The New Industrial/Retail Project alternative, which envisioned the development of approximately 300,000 square feet of retail at the Arcadia Park project site (as was allowed by the zoning designation that was in effect for the site at the time of the Arcadia Park EIR), would have generated at least four times the number of daily car trips as the Arcadia Park project, resulting in similar or worse impacts to traffic. The Reduced Density alternative, which considered the development of the site with approximately 300 units (as opposed to the 366 proposed by the Arcadia Park project), would have avoided the significant traffic impact, but was deemed economically infeasible due to the reduction in the number of sellable residential units.

B. Applicable Program EIRs

The analysis in the Arcadia Park EIR applies directly to the 2019 project, providing the basis for use of an Addendum. Additionally, two Program EIRs collectively referred to as "Program EIRs" are described below.

- 1998 General Plan Land Use and Transportation Element (LUTE) EIR[4]
- 2010 General Plan Housing Element Update EIR[5] and its 2014 Addendum[6]

An EIR was prepared and certified for each of these planning documents. The Arcadia Park EIR together with the Program EIRs are collectively referred to as "Previous CEQA Documents."

Each of these documents is summarized below and hereby incorporated by reference and can be obtained from the City of Oakland Bureau of Planning at 250 Frank H. Ogawa Plaza, Suite 2114, Oakland, California 94612, and viewed online at: https://www.oaklandca.gov/resources/completed-environmental-review-ceqa-eir-documents

1. Land Use and Transportation Element EIR

The City certified the EIR for the General Plan LUTE in 1998 (1998 LUTE EIR). The LUTE identifies land use policies and sets forth an action program to implement the land use policy through development controls and other strategies.

As stated previously, the 1998 LUTE EIR is designated as a Program EIR under CEQA Guidelines Sections 15183 and 15183.3. As such, subsequent activities under the LUTE are subject to the requirements of these CEQA sections (see *Chapter V, CEQA Checklist,* for further discussion). Applicable mitigation measures identified in the 1998 LUTE EIR are largely the same as those identified in the other Program EIRs prepared after the 1998 LUTE EIR, either as mitigation measures or newer SCAs, the latter of which are described below in *Chapter V, CEQA Checklist*.

Environmental Effects Summary

The 1998 LUTE EIR determined that development consistent with the LUTE would result in impacts that would be reduced to a less-than-significant level with the implementation of mitigation measures and/or SCAs. Mitigation is required for the following resource topics: Aesthetics (views, architectural compatibility and shadow only); Air Quality (construction dust [including particulate matter less than 10 microns in diameter] and roadway

[4] City of Oakland, 1998. General Plan: Land Use and Transportation Element, Final EIR, March. As amended through 2012.
[5] City of Oakland 2010. 2007-2015 Housing Element Update, Final EIR
[6] City of Oakland 2014. 2015-2023 Housing Element Addendum to the 2010 Housing Element.

emissions in Downtown, odors); Cultural Resources (except as noted below as less than significant); Hazards and Hazardous Materials; Land Use (use and density incompatibilities); Noise (use and density incompatibilities, including from transit/transportation improvements); Population and Housing (induced growth, policy consistency/clean air plan); Public Services (except as noted below as significant); and Transportation and Circulation, but only for intersections in downtown, not in the 2019 project vicinity.

In the 1998 LUTE EIR, less-than-significant impacts were identified for the following resources: Aesthetics (scenic resources, light and glare); Air Quality (clean air plan consistency; roadway emissions in Downtown, which is not relevant given that the 2019 project is not located in Downtown; energy use emissions; local/regional climate change); Biological Resources; Cultural Resources (historic context/settings, architectural compatibility); Energy; Geology and Seismicity; Hydrology and Water Quality; Land Use (conflicts in mixed-use projects and near transit); Noise (roadway noise downtown that is not relevant given that the project is not located in downtown and citywide, multi-family near transportation/transit improvements); Population and Housing (exceeding household projections, housing displacement from industrial encroachment); Public Services (water demand, wastewater flows, stormwater quality, parks services); and Transportation and Circulation (transit demand). No impacts were identified for Agricultural and Forestry Resources or Mineral Resources.

Significant and unavoidable impacts were identified for the following environmental resources in the 1998 LUTE EIR: Air Quality (regional emissions, roadway emissions Downtown); Noise (construction noise and vibration in Downtown and the Coliseum Showcase District but not in the vicinity of the 2019 project site); Public Services (fire safety in the Oakland Hills); Transportation and Circulation (roadway segment operations); Wind Hazards; and Policy Consistency (clean air plan). Due to the potential for significant unavoidable impacts, a Statement of Overriding Considerations was adopted as part of the City's approvals.

2. Oakland Housing Element Update EIR and Addendum

Since the 2005 Arcadia Park EIR, the City has twice amended its General Plan to adopt updates to the Housing Element. The City certified an EIR for the 2007-2015 Housing Element Update in 2010 (2010 Housing Element EIR) and an Addendum to that EIR for the 2015-2023 Housing Element Update in 2014 (2014 Addendum). The General Plan identifies the City's current and projected housing needs, and sets goals, policies, and programs to address those needs, as specified by the State of California Regional Housing Needs Allocation (RHNA) process. The Madison Park 98th Avenue Project would contribute to the total number of new housing units needed within Oakland to meet its RHNA target. Applicable mitigation measures and SCAs identified in the 2010 Housing Element EIR are considered in the analysis of the residential components in this document, as the 2005 Arcadia Park project was shown as an approved project within the 2007-2015 Housing

Element Update. As stated previously, the 2010 Housing Element EIR was designated as a Program EIR under CEQA Guidelines Sections 15183 and 15183.3. As such, subsequent activities under the Housing Element are subject to requirements under these CEQA Sections.

Applicable mitigation measures and SCAs (also described in *Chapter V, CEQA Checklist*) identified in the 2010 Housing Element EIR and 2014 Addendum are considered in the analysis of this document.

Environmental Effects Summary

The 2010 Housing Element EIR, including its Initial Study Checklist, determined that housing developed pursuant to the Housing Element would result in impacts that would be reduced to a less-than-significant level with the implementation of mitigation measures and/or SCAs (described in Attachment A). Mitigation is required for the following resource topics: Aesthetics (visual character/quality and light/glare only); Air Quality (except as noted below); Biological Resources; Cultural Resources; Geology and Soils; Greenhouse Gas Emissions; Hazards and Hazardous Materials (except as noted below, with no impacts regarding airport/airstrip hazards and emergency routes); Hydrology and Water Quality (except as noted below); Noise; Public Services (police and fire only); and Utilities and Service Systems (except as noted below).

Less-than-significant impacts were identified for the following resources in the 2010 Housing Element EIR: Hazards and Hazardous Materials (emergency plans and risk via transport/disposal); Hydrology and Water Quality (flooding/flood flows, and inundation by seiche, tsunami, or mudflow); Land Use (except for no impact regarding community division or conservation plans); Population and Housing (except for no impact regarding growth inducement); Public Services and Recreation (except as noted above, and no impact regarding new recreation facilities); and Utilities and Service Systems (landfill, solid waste, and energy capacity only, and no impact regarding energy standards). No impacts were identified for Agricultural and Forestry Resources or Mineral Resources.

Significant unavoidable impacts were identified for the following environmental resources in the 2010 Housing Element EIR: Air Quality (toxic air contaminant exposure) and Transportation and Circulation (traffic delays). Due to the potential for significant unavoidable impacts, a Statement of Overriding Considerations was adopted as part of the City's approvals.

III. PROJECT DESCRIPTION

This chapter describes the Madison Park 98th Avenue Project (2019 project), which is evaluated in this CEQA Analysis. The 2019 project site and existing site conditions are described, the project details are discussed, and the required project approvals are presented.

A. Project Site

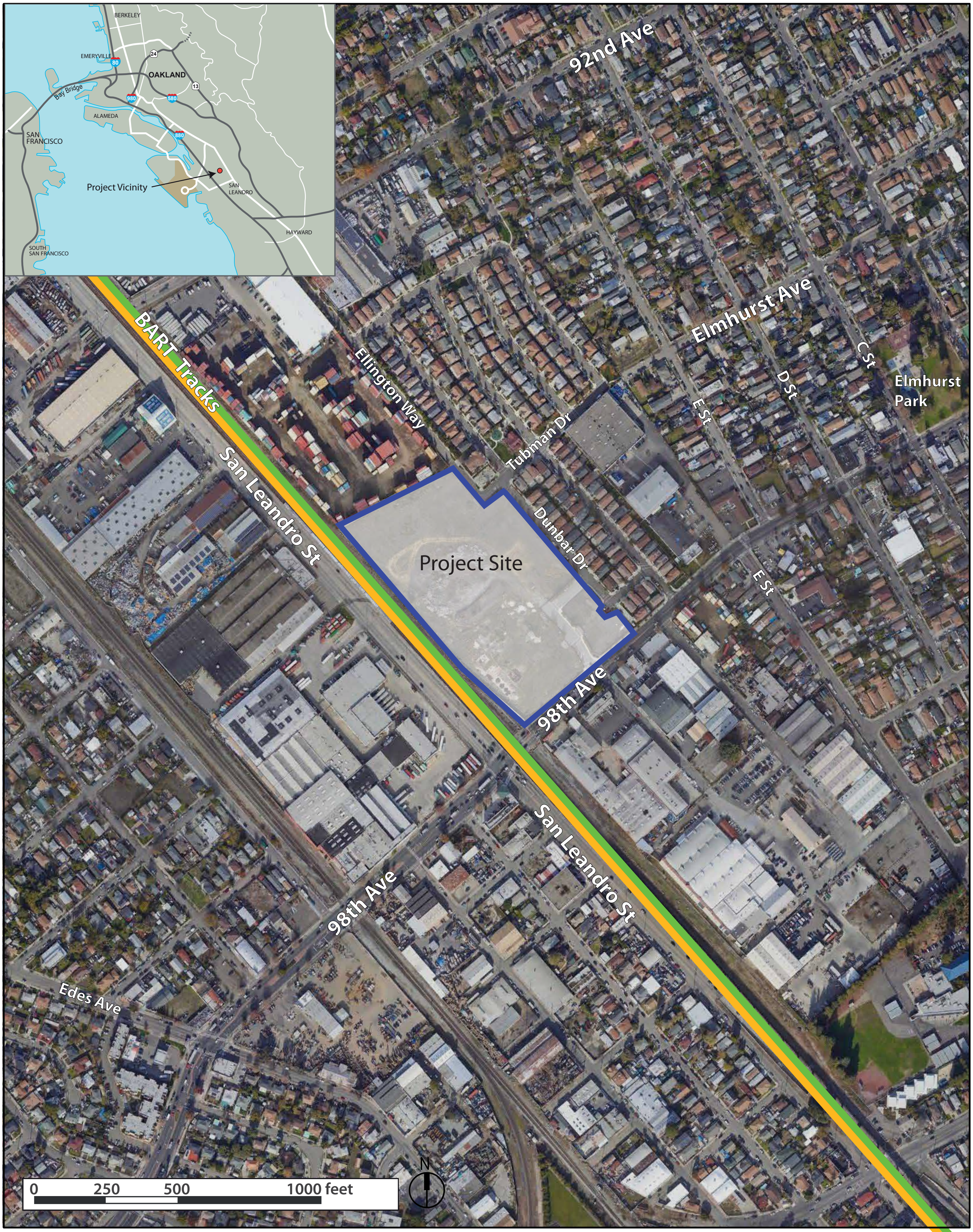
1. Location and Site Characteristics

As shown in Figure 1, the 2019 project is in the Elmhurst Park neighborhood in East Oakland at 921 98th Avenue, approximately 1.5 miles southeast of the Oakland-Alameda County Coliseum. The 2019 project site is bordered to the north by a cargo storage and distribution facility owned by Fast Lane Transportation Inc., Dunbar Drive to the east, 98th Avenue to the south, and Bay Area Rapid Transit (BART) tracks and San Leandro Street to the west. The 2019 project is located 1.3 miles to the south of the Coliseum BART station and 1.7 miles to the north of the San Leandro BART Station as shown on Figure 1. Interstate (I)-880 is located 0.7 miles to the west and I-580 is 1.7 miles to the east.

The 2019 project site is comprised of two parcels totaling 10.16 acres, inclusive of existing right of way. It is located in the southwest corner of the 27.5-acre Arcadia Park project site and was planned to be the final phase of the Arcadia Park project, which was evaluated in the Arcadia Park EIR but was never developed. The site includes the following addresses and assessor's parcel numbers (APNs): 44-5080-180 (921 98th Avenue) and 44-5080-179 (999 98th Avenue).The project site is predominately flat and contains the foundations of former buildings. Concrete walls and chain-link and wooden fencing surround the entire site. Existing landscaping includes sparse vegetation and a single mature Monterey Pine tree within the site.

Previously, the site was a yeast production plant and storage facility operated by Fleischmann Yeast Company. Chemicals used in the production, transportation, and processing of Fleischmann's products were stored both above ground in 55-gallon drums and in underground storage tanks (USTs)[7]. During the operation of Fleischmann's Yeast Company, the site was contaminated with hazardous waste, including releases from fuel USTs, resulting in the listing of the site on the hazardous sites and substances list ("Cortese List") compiled pursuant to California Government Code Section 65962.5. As part of a previous development proposal, contaminated soil and groundwater were

[7] CirclePoint, 2005, City of Oakland Arcadia Park Residential Development Project Draft Environmental Impact Report, page III.C.2. State Clearinghouse #2005024026. December 2005.



Source: Google Earth Pro, 2018

Figure 1
Project Location and Regional Vicinity Map

Madison Park 98th Avenue Project

removed from the site, and in 2014 the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) certified that the site was granted 'No Further Action' status. The Closure Letter indicated that with the application of appropriate mitigation measures during construction, the trace contamination that remains on the project site does not pose a significant risk to human health and the environment.

2. Surrounding Land Uses

Land uses surrounding the project site include residential, commercial, and industrial uses. Fast Lane Transportation, Inc., a cargo storage, and distribution facility, is located to the northwest of the project site. A neighborhood of single-family homes is located along the eastern border of the site. Existing uses to the southeast are primarily light-industrial uses, including a mattress recycling facility and a plumbing fixture manufacturer. Existing uses to the west, across San Leandro Street, include several trucking and logistics firms. The western edge of the parcel is also abutted by elevated BART tracks and Union Pacific railroad tracks. The Alameda County Transportation Commission has planned a pedestrian/bicycle greenway for the area between the project's western edge and the elevated BART tracks, although construction has not yet begun on this project[8].

3. Existing General Plan and Zoning

The City of Oakland General Plan land use classification for the site, as established by the Land Use and Transportation Element (LUTE), is Housing and Business Mix[9]. The Housing and Business Mix General Plan land use classification recognizes the equal importance of both housing and business and is intended to guide a transition from heavy industry to low-impact light industrial and other businesses that can co-exist compatibly with residential development. When the City Council adopted the HBX zoning designations, the City Council found that the adoption of the HBX zoning provisions, including density, was consistent with the General Plan LUTE. Maximum densities for individual properties are specified in implementing ordinances, in particular the zoning ordinance if enacted after the General Plan and found consistent with the General Plan by City Council action. Therefore, the maximum density for the Housing and Business Mix General Plan classification is equivalent to the highest density HBX zone, which is a maximum of 730 square feet per unit for residential density and a maximum non-residential FAR of 2.5.

The zoning designation for the site is HBX-1, Housing and Business Mix 1. The HBX-1 commercial zone is intended to provide development standards that provide for the compatible coexistence of industrial and heavy commercial activities and medium density residential development[10]. The maximum residential density (without bonuses) allowed for

[8] Alameda County Transportation Commission, East Bay Greenway, Lake Merritt BART to South Hayward BART, accessed November 13, 2018. https://www.alamedactc.org/eastbaygreenway

[9] City of Oakland, March 1998. General Plan, Land Use and Transportation Element.

[10] Oakland Planning Code 17.65.010

the project site is 1,000 square feet of lot area per unit. The zoning is calculated by first calculating the commercial and then subtracting the commercial square footage from the residential capacity , which allows a maximum of 338 units. With a Planned Unit Development (PUD) bonus[11] approval, the project is allowed a 25 percent increase of the density allowed per zoning up to the maximum density permitted under the General Plan. The 25 percent PUD bonus allows for an increase to 423 units. The project's proposed 399 dwelling units falls within the permitted number of units.

The maximum height allowed in the HBX-1 is 35 feet unless the site is adjacent to a BART right-of-way. Section 17.65.100(B) of the City of Oakland's Planning Code states that structures on lots adjacent to a BART right-of-way with above-ground tracks and within the closest 125 feet of the right-of-way are eligible for a 75-foot height limit and/or the maximum permitted height limit is modified as part of the PUD. On Parcels A, B, and C, 60 feet is allowed since these parcels are located within 125 feet of the BART right-of-way and eligible for the 75-foot height limit. Although Parcel D is not within 125 feet from the BART right-of-way, height limits may be waived or modified as part of the PUD permitting process pursuant to Section 17.142.10(G) of the City of Oakland Planning Code.[12] Parcel C and D have a maximum height of 45 feet, and Parcels E, F, and G have a maximum of 35 feet. HBX-1 zone has a maximum Floor Area Ratio (FAR) of 1.75 for all structures, and the project's overall FAR is 1.72.

B. Project Characteristics

1. Development Program

The 2019 project proposes the construction of 14 buildings ranging in height from three to five stories. The project includes a mixture of apartments, live/work units, and attached townhomes with a total of approximately 399 residential units (approximately 581,146 square feet); 2,468 square feet of ground floor retail space; and 11,688 square feet of work/live area (9 work/live units). Various infrastructure improvements including new streets, sidewalks, sewers, and storm drains are also proposed as part of the project to serve the new buildings. An overview of the project's components is shown in Table 2.

The 2019 project would involve site preparation, grading, and the removal of existing construction materials on-site to allow construction of the 14 buildings. The site will be separated into 7 parcels by public right-of-way (ROW) and/or a woonerf plaza and community open space , as shown on Figure 2. The project site plan, first floor plan, site

[11] Oakland Planning Code 17.142.100 (G)
[12] Oakland Planning Code 17.142.100(G)

sections, axonometric view from the north east, landscaping plan, and grading plan, are shown in Figures 2 through 7.

- Parcel A would be developed with one 5-story building at the southeastern corner of the project site (as shown on Figure 2, and Figure 4). The building includes 90 apartment units, 7 live/work units, and 9 work/live units as well as 2,468 square feet of retail space. Parcel A provides 1.00 parking spaces per unit. Immediately outside of the retail space, a plaza fronting Blake Drive provides community open space.
- Parcel B would be developed with one five-story building (as shown on Figure 4) with 86 apartment units. Parcel B provides 0.90 parking spaces per unit.
- Parcel C, located on the southwestern corner of the project site (as shown on Figure 2), would be developed with a four-story building with 34 apartment units. Parcel C provides 1.06 parking spaces per unit.
- Parcel D, located at the northwestern corner on the project site, would be developed with one four-story building (as shown on Figure 4) with 60 apartment units. Parcel D provides 0.90 parking spaces per unit.
- Parcels E, F, and G would be developed with four buildings, four buildings, and two buildings, respectively, as shown on Figure 4. Each of the four buildings proposed on Parcels E and F include 48 three-story townhouses that provide two parking spaces per townhouse. Parcel G building includes 26 three-story townhouses with two parking spaces per townhouse and is located on the northwestern corner of the project site.

TABLE 2 MADISON PARK PROJECT DEVELOPMENT DETAILS

	Arcadia Park EIR	Current 2019 (Built To-Date)	2019 98th and San Leandro Project (Proposed)	Plus Project (Built To-Date & Proposed)	Net Change [a]
Residential Units					
Apartments	0	--	270	--	--
Townhouse	184	4	122	--	--
Live/Work	--	--	7	--	
Detached condominium units	108	--	0	--	--
Single-family units	74	164	0	--	--
Total Residential Units	*366* [b]	168	*399*	567	*+201*
Floor Areas					
Work/Live Area (Commercial)	0	0	11,688 sf	11,688 sf	*+11,688 sf*
Work/Live Units	0	0	9 units	9 units	*+9 units*
Commercial Area [c]	0	0	2,468 sf	2,468 sf	+2,468 sf
Details					
Open Space [b]	67,507 sf	33,320 sf	36,797 sf	70,117	*+2,610 sf*

TABLE 2 MADISON PARK PROJECT DEVELOPMENT DETAILS

	Arcadia Park EIR	Current 2019 (Built To-Date)	2019 98th and San Leandro Project (Proposed)	Plus Project (Built To-Date & Proposed)	Net Change [a]
Parking (off street)	732 spaces	336	517 spaces	853	*+121 spaces*
Max. Height	38 feet	28 feet	60 feet	60 feet	*++22 feet***

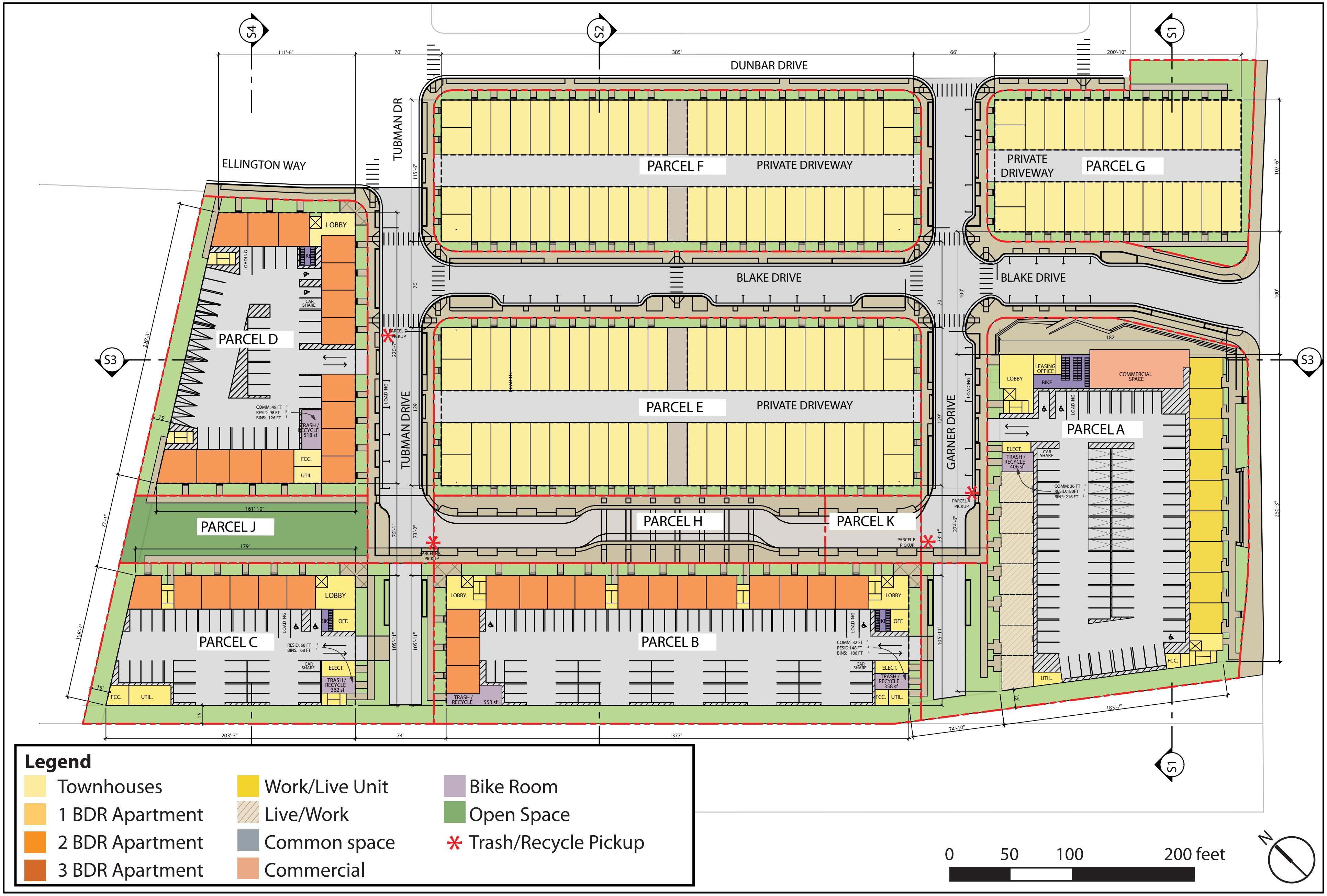
Notes: sf=square feet
[a] Net change is the change between the Arcadia Park EIR and the Current 2019 Plus Project (Built-To-Date & proposed project) scenarios.
[b] The Arcadia Park project was originally approved with 366 units. Subsequent to the original approval, the Director of City Planning administratively approved a reduction in the number of residential units from 366 to 365.
[c] One of the alternatives in the Arcadia Park EIR considered approximately 300,000 square feet of retail at the Arcadia Park project site; however, for the purpose of this comparison commercial area is not included for the Arcadia Park EIR.
**
Sources: Arcadia Park EIR, 2005; Madison Park, 2018, Oakland Planning Code 17.142.100(G).

Table 2 also provides a comparison of the 2019 project to the project evaluated in the Arcadia Park EIR, the current built-to-date conditions, and the current conditions plus the 2019 project. The key differences include the addition of 201 residential units, the addition of 9 work/live units that total 11,688 square feet of commercial (split between the 9 units), and an increase in maximum building height from 38 feet to 60 feet, as well as the elimination of single-family units.

Source: Van Meter Williams Pollack, LLP and Jett Landscape Architecture and Design, 2020.

Madison Park 98th Avenue Project

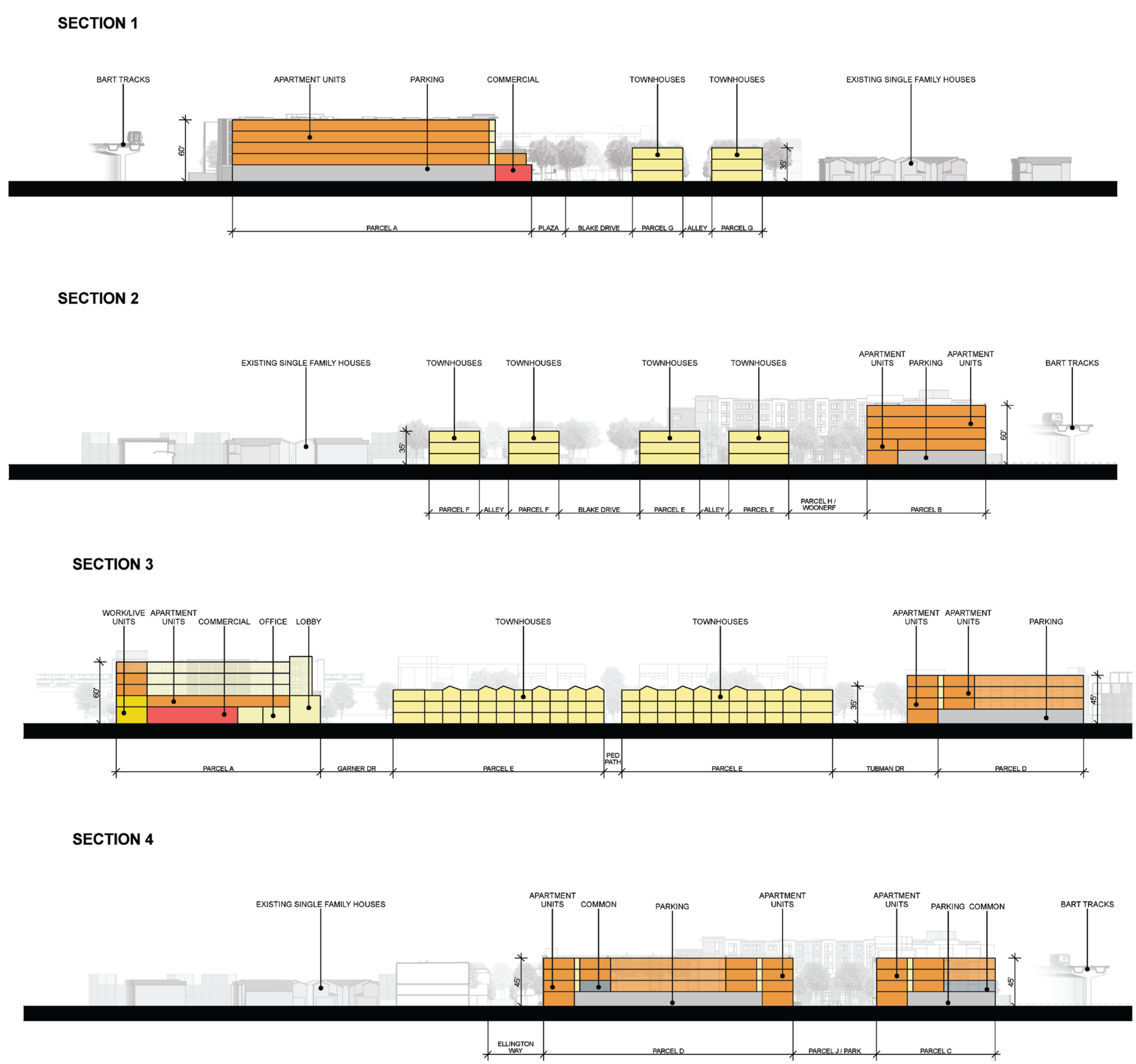
Figure 2
Site Plan



Source: Jett Landscape Architecture and Design and Van Meter Williams Pollack, 2020

Madison Park 98th Avenue Project

Figure 3
Ground Floor Plan



Source: Van Meter Williams Pollack, LLP and Jett Landscape Architecture and Design, 2020.

Madison Park 98th Avenue Project

Figure 3
Site Sections

Source: Van Meter Williams Pollack, LLP and Jett Landscape Architecture and Design, 2020.

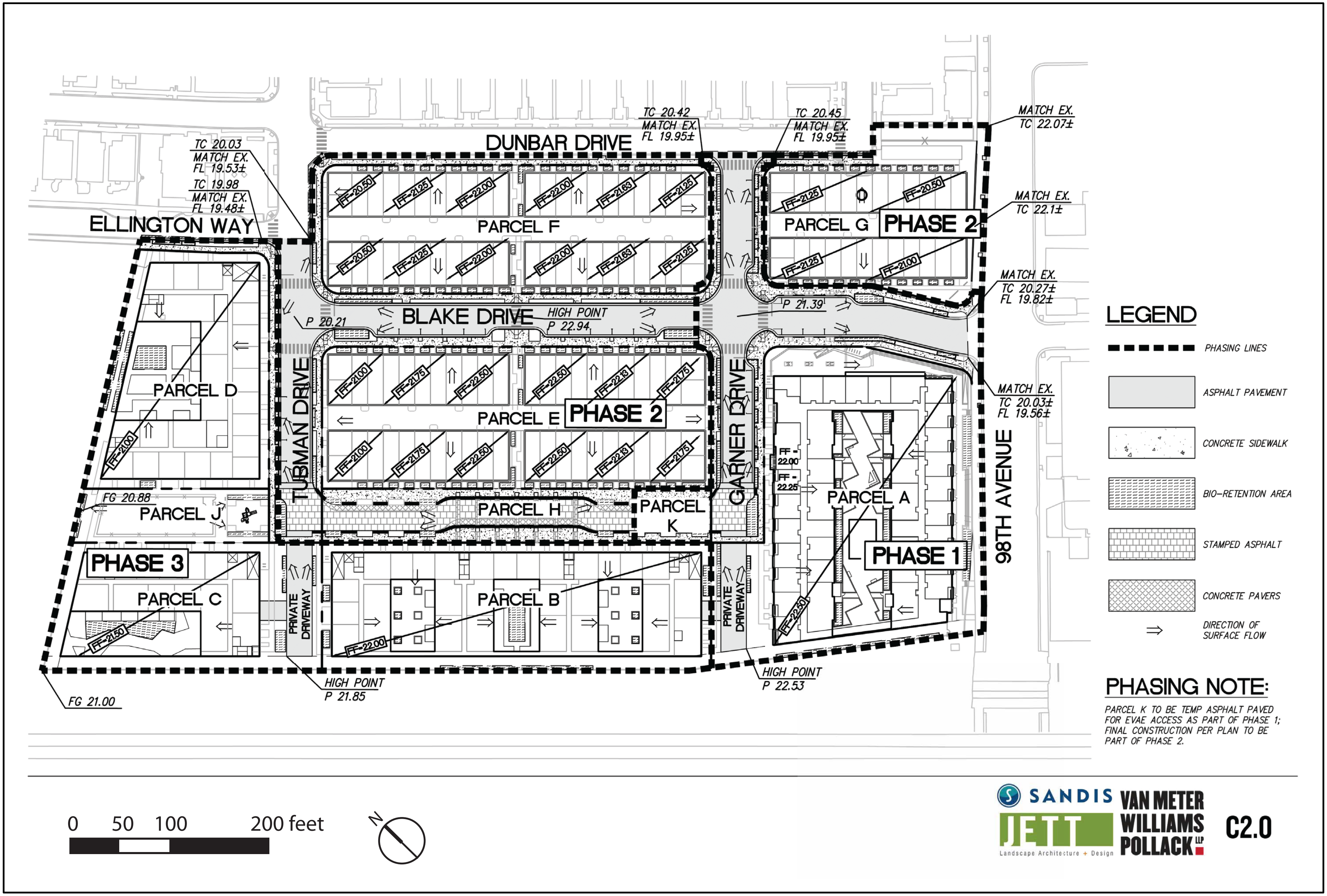
Madison Park 98th Avenue Project

Figure 5
Axonometric View from North East

Source: Van Meter Williams Pollack, 2020

Madison Park 98th Avenue Project

Figure 6
Landscaping Plan



Source: Van Meter Williams Pollack, 2020.

Madison Park 98th Avenue Project

Figure 7
Grading Plan

2. Circulation and Parking

The site layout provides access for various modes including vehicles, pedestrians, and bicycles, and includes 72,387 square feet of street/right of way area. Automobiles would access the site from 98th Avenue and 92nd Avenue (via Ellington Way) as well as via Dunbar Drive, as shown on Figure 2. The 2019 project also proposes the construction and/or extension of several public streets. Tubman Drive would be extended from its current western terminus at Ellington Way to the western edge of the project site. Blake Drive would be extended from its current terminus at Garner Drive to Tubman Drive. Garner Drive would be extended from Blake Drive to the western edge of the project site. Between the townhouse buildings on Parcel E, F, and G, north-south alleys would provide vehicular access and pedestrian alleys would provide east-west circulation. Parcel H and Parcel K (the park/woonerf/plaza community space) provides vehicular access within the site and emergency vehicle access.

Overall, the 2019 project would provide 1.00 parking spaces per dwelling unit for Parcel A, 0.90 parking spaces for Parcel B, 1.06 parking spaces for Parcel C, 0.90 parking spaces per dwelling unit for Parcel D, and 2 parking spaces per unit for Parcels E-G. A total of 517 spaces would be provided, consisting of 215 standard parking spaces, 58 stacker parking spaces, and 244 tandem parking spaces for townhomes. Table 3 shows complete details of the proposed parking. In addition, the 2019 project also proposes four carshare spaces (1 space in Parcel A, 1 space in Parcel B, 1 space in Parcel C and 1 space in Parcel D). These are not included in the 517 total.

TABLE 3 PROPOSED PARKING

	Parcel A	Parcel B	Parcel C	Parcel D	Parcel E	Parcel D	Parcel F	Total
Total	106	77	36	54	96	96	52	**517**

Source: Madison Park Project Information Sheet, A0.1. December 10, 2018.

3. Landscaping, Open Space and Streetscape

Landscaping would be incorporated along all roadways bordering the site (98th Avenue, Dunbar Drive, and Ellington Way), as well as along internal roads that would be built as part of the project (Tubman Drive, Blake Drive, and Garner Drive). Streetscape elements, illustrated in Figure 6, would include street trees immediately adjacent to roadways, as well as landscaped medians between sidewalks and buildings.

In addition to landscaping along sidewalks and roadways, the 2019 project includes a linear park that features a 46-foot wide lawn area, trees, and landscaped medians in between Parcels C and D as well as a woonerf in between Parcels E and B. A summary of the provided Group Open Space and private open space is below.

Open Space. The project would provide a total of 36,797 square feet of Group Open Space, as well as 45,845 square feet of private open space (balconies, patios) for a total of 82,642 square feet of total open space. Group Open Space shall be accessible to all the living units on the lot, and the space may be located anywhere on the lot within 20 feet of the living units served, and is a Planning Code requirement for residential units[13] Private usable open space shall be accessible to only one living unit by a doorway to a habitable room or hallway, and may be located anywhere on the lot, except that ground-level space shall not be located in a required minimum front yard and except that above-ground-level space shall not be located within five (5) feet of an interior side lot line.[14]

According to Oakland's Municipal Code Section 17.126.020, each square foot of private usable open space conforming to Section 17.126.040, cited directly above, shall be considered equivalent to two square feet of required Group Usable Open Space and may be so substituted. According to the development standards stated in Section 17.142.110 of the Oakland Municipal Code, 200 square feet of Group Usable Open Space per dwelling unit is required for PUDs. For work/live units the requirement for Group Usable Open Space is 75 square feet for unit.[15]

4. Utilities and Infrastructure Improvements

Utility services are currently provided to existing buildings surrounding the project site and would be readily available to serve the project upon the project sponsor's request to the applicable public agencies. Water supply and treatment and wastewater treatment are provided to Oakland by East Bay Municipal Utility District (EBMUD). The project site is currently served by sanitary sewer and water lines installed by Pulte Homes. Minor connections to these existing lines would be required to serve new structures on the project site.

The 2019 project would provide sewer, water, stormwater drainage, and water quality infrastructure in accordance with the City of Oakland's Standard Conditions of Approval as further described under the utilities and services section of this Addendum. The project applicant, the project design, and occupants of the project site would be required to comply with the waste reduction and recycling regulations outlined in Oakland Municipal Code Chapter 15.34.

The 2019 project would seek to achieve Green Point Rated certification. The Green Point Rated certification would require the project sponsor to incorporate sustainability

[13] Oakland Planning Code 17.126.030
[14] Oakland Planning Code 17.126.040
[15] Oakland Planning Code 17.65.150

measures, such as water-efficient plumbing and energy-efficient appliances and include all CALGreen design elements.

5. Demolition and Site Preparation

All existing landscaping including the sparse vegetation and Monterey Pine tree would be removed.

Construction Operations and Schedule

Construction is anticipated to commence in three phases. Phase 1 is expected to begin in 2021. The timing for Phase 2 and Phase 3 has not yet been determined. As shown in Figure 7, Phase 1 includes Parcel A, Garner Drive, and the east end of Blake Drive (from Garner Drive to 98th Avenue). Phase 2 includes Parcels E, F, and G, Tubman Drive, and the west end of Blake Drive (from Tubman Drive to Garner Drive) and the public access across Parcel H and Parcel K. Phase 3 includes Parcel B, C, D, and J and improvements along Ellington Way. Construction equipment would most likely include excavators, graders, rubber-tired dozers, tractors, loaders, backhoes, cranes, forklifts, tractors, loaders, drill rigs, and pumps.

C. DISCRETIONARY ACTIONS

It is anticipated that this Addendum would provide environmental review for all discretionary approvals and actions necessary for the 2019 project. Multiple permits and approvals would be required before the development of the project could proceed. As Lead Agency for the project, the City of Oakland would be responsible for most approvals required for development. Other agencies also have some authority related to the project and its approvals. A list of required permits and approvals that may be required by the City and other agencies includes, without limitation, those provided below.

1. City of Oakland

The City's discretionary approvals include, but may not be limited to:

- Planned Unit Development Permit/Preliminary Development Plan (PUD/PDP) and Final Development Plan (FDP) which would also allow increased height near BART tracts (Per Section 17.134.020 (A) (1) (a, b, and e).
- Planning Commission – Regular Design Review as part of the Design Review Committee (DRC) for new construction, CEQA Determination, a minor variance to allow Type 3 W/L units on 98th Street that are not at the street level, and Vesting Tentative Tract Map..

Administrative and ministerial City permits required for the project include, but may not be limited to:

- Building Bureau and Department of Transportation– Building permit and other related on-site and off-site work permits or improvements.

Planned Unit Development/Preliminary Development Plan & Final Development Plans

The 2019 project would require approval of a Planned Unit Development/Preliminary Development Plan (PUD/PDP) and Final Development Plan (FDP) depicting the project site layout and design, including all required improvements in the public ROW. The project sponsor is requesting a PUD Bonus for an increase in the maximum allowed development on-site and for greater flexibility on development standards. The PUD permitting process allows projects to waive or modify certain zoning standards, such as use, density, and height, in exchange for adherence to a comprehensive development plan, dedication of open space, and construction of key infrastructure. The PUD requires projects to provide 200 square feet of Group-Usable Open Space per dwelling unit. The PUD/PDP requires review and approval by the Planning Commission, based on recommendations by the City Engineer, including the City Surveyor and Fire Department. Subsequent FDPs would require approval by the Planning Commission with recommendations by the Planning Department.

2. Actions by Other Agencies

The project would require administrative approvals from other agencies and utility providers such as:

- East Bay Municipal Utility District (EBMUD): Approval of new service requests and new water meter installations.
- San Francisco Regional Water Quality Control Board (RWQCB): National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharge.

Bay Area Rapid Transportation Agency (BART): Issuance of any encroachment permits for BART property if necessary

IV. SUMMARY OF FINDINGS

The purpose of this CEQA document is to evaluate the potential environmental effects of the Madison Park 98th Avenue Project (2019 project) and to determine whether such impacts were adequately covered under the Arcadia Park EIR and the Program EIRs such that CEQA streamlining and/or tiering provisions and exemptions would be appropriate. The CEQA Checklist evaluation in *Chapter V, CEQA Checklist,* concludes that the project qualifies for an Addendum on a separate and independent basis from the applicable exemptions from additional environmental review. The 2019 project was found to be consistent with the development density and land use characteristics established by the City of Oakland General Plan, and any potential environmental impacts associated with its development were adequately analyzed and covered by the analysis in the Arcadia Park EIR and in the following applicable Program EIRs: the 1998 LUTE EIR, and the 2010 Housing Element EIR and 2014 Addendum.

The 2019 project would be required to comply with the applicable mitigation measures identified in the Arcadia Park EIR and any applicable City of Oakland SCAs presented in Attachment A to this document.[16] With the implementation of the applicable mitigation measures and SCAs, the 2019 project would not result in a substantial increase in the severity of significant impacts identified in the Arcadia Park EIR and/or the Program EIRs, nor would it result in any new significant impacts not identified in any of those Previous CEQA Documents.

In accordance with Public Resources Code Sections 21083.3, 21094.5, and 21166, and CEQA Guidelines Sections 15162, 15164, 15168, 15183, 15183.3, and as set forth in the CEQA Checklist below, the 2019 project qualifies for an addendum and one or more exemptions because the following findings can be made:

- **Addendum.** The Arcadia Park EIR analyzed the impacts of development of the Arcadia Park project. The 2019 project would not cause new significant impacts not previously identified in the Arcadia Park EIR and would not result in a substantial increase in the severity of previously identified significant impacts. No new mitigation measures would be necessary to reduce significant impacts. No changes have occurred with respect to circumstances surrounding the Arcadia Park EIR that would cause significant environmental impacts to which the project would contribute considerably, and no new information has been put forward that shows the project would cause significant environmental impacts. The changes on the 10.16-acre portion of the Arcadia Park site include an increase in residential density with 201 additional multi-family residential units, the elimination of single-family units, and the addition of 9 work/live units (11,688 square feet of commercial split between the 9 units) introducing commercial uses to the project. These modifications would result in the site being developed as a mixed-use residential project, but the majority of the development would remain residential with just over 2 percent of the development being commercial work-live units. Although the projects are different, the prior CEQA analysis can be relied upon since the 2019 project revisions or changes under which the project would be undertaken or new information would not result in an increase in the severity of significant impacts, nor would they result in new significant impacts. The 2019 project therefore meets the requirements for an addendum, as evidenced in Attachment B to this document. Therefore, no supplemental environmental review is required in accordance with Public Resources Code Section 21166 and CEQA Guidelines Sections 15162 and 15164.

- **Community Plan Exemption.** Public Resource Code Section 21083.3 and CEQA Guidelines Section 15183 (Projects Consistent with a Community Plan or Zoning) allow streamlined environmental review for projects that are "consistent with the development density established by existing zoning, community plan or general plan policies for which an EIR was certified, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site." Based on the analysis conducted in this document, the 2019 project also qualifies for a community plan exemption. The 2019 project is permitted in the zoning district where the project site is located and is consistent with the bulk, density, and land uses envisioned for the site. This CEQA Analysis considers the analysis in the 2010 Oakland Housing Element EIR for the evaluation of the housing components of the 2019 project, and further reconsiders the analysis in the 1998 LUTE EIR for the overall project. This CEQA Analysis concludes that the 2019 project would not result in significant impacts that (1) are peculiar to the project or project site; (2) were not identified as significant project-level, cumulative, or off-site effects in the Arcadia Park EIR; or (3) were previously identified as significant effects, but are determined to have a more severe adverse impact than discussed in the EIR. Findings regarding the 2019 project's consistency with zoning are included as Attachment C to this document.
- **Qualified Infill Exemption.** Public Resources Code Section 21094.5 and CEQA Guidelines Section 15183.3 (Streamlining for Infill Projects) allow streamlining for certain qualified infill projects by limiting the topics subject to review at the project level, if the effects of infill development have been addressed in a planning level decision, or by uniformly applicable development policies. Infill projects are eligible if they (1) are located in an urban area on a site that either was previously developed or that adjoins existing qualified urban uses on at least 75 percent of the site's perimeter; (2) satisfy the performance standards provided in CEQA Guidelines Appendix M; and (3) are consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy. This CEQA Analysis indicates that the 2019 project qualifies for an infill exemption and is generally consistent with

the required performance standards provided in CEQA Guidelines Appendix M, as evaluated in Table D-1 in Attachment D to this document. This CEQA Analysis concludes that the 2019 project would not cause any new specific effects or more significant effects than previously identified in applicable planning-level EIRs, and that uniformly applicable development policies or standards (SCAs) would substantially mitigate the project's effects. The 2019 project is proposed on a previously developed site in East Oakland and is surrounded by urban uses. The 2019 project is consistent with the land use, density, building intensity, and applicable policies for the site. The 2019 project therefore meets the requirements for a Qualified Infill Exemption, as evidenced in Attachment D to this document. The analysis herein considers the analysis in the Arcadia Park EIR, 1998 LUTE EIR, and (for the residential components of the project only) 2010 Housing Element EIR and 2014 Addendum.

- **Program EIRs.** CEQA Guidelines Section 15168 (Program EIRs) provide that the 1998 LUTE EIR and 2010 Housing Element EIR and 2014 Addendum can be used as Program EIRs in support of streamlining and/or tiering provisions under CEQA. Overall, based on an examination of the analysis, findings, and conclusions of the Arcadia Park EIR, as well as those of the 1998 LUTE EIR, and the 2010 Housing Element EIR and 2014 Addendum—all of which are as summarized in the CEQA Checklist in *Chapter V* of this document—the potential environmental impacts associated with the 2019 project have been adequately analyzed and covered in prior Program EIRs and the Arcadia Park EIR. Therefore, no further review or analysis under CEQA is required.

Each of the above findings provides a separate and independent basis for CEQA compliance.

Signature
Ed Manasse, Environmental Review Officer

12/9/2020
Date

V. CEQA CHECKLIST

A. Overview

The analysis in this CEQA Checklist summarizes the potential environmental impacts that could result from approval and implementation of the 2019 project, as evaluated in the certified Arcadia Park EIR. The analysis in this CEQA Checklist also summarizes the impacts and findings of Program EIRs that covered, specifically or as part of the cumulative analyses, the environmental effects of development at the project site and that are still applicable for the project. Given the timespan between the preparations of these EIRs, there are variations in the specific environmental topics addressed and significance criteria. However, as discussed throughout this Checklist, the overall environmental effects identified in each are largely the same and any significant differences are noted. This CEQA Checklist hereby incorporates by reference the discussion and analysis of all potential environmental impact topics as presented in the Previous CEQA Documents. The significance criteria from the Arcadia Park EIR and Program EIRs have been consolidated and abbreviated in this CEQA Checklist for administrative purposes; where appropriate, the significance criteria have been updated to reflect current City of Oakland significance criteria established after the Arcadia Park EIR and that now apply to the 2019 project.

This CEQA Checklist provides a determination of whether the project would result in any of the following:

- Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents
- Substantial Increase in Severity of Previously Identified Significant Impact in the Previous CEQA Documents
- New Significant Impact

Where the severity of the impacts of the 2019 project would be the same as or less than the severity of the impacts described in the Previous CEQA Documents, the checkbox for "Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents" is checked. A check in the checkbox for "Substantial Increase in Severity of Previously Identified Significant Impact in the Previous CEQA Documents" or "New Significant Impact" indicates significant impacts that would be one of the following:

- Peculiar to the project or project site (pursuant to CEQA Guidelines Section 15183 or 15183.3).
- Not identified in the previous EIRs (Previous CEQA Documents) (per CEQA Guidelines Section 15183 or 15183.3), including off-site and cumulative impacts (per CEQA Guidelines Section 15183).
- Due to substantial changes in the project (per CEQA Guidelines Sections 15162 and 15168).

- Due to substantial changes in circumstances under which the project would be undertaken (per CEQA Guidelines Sections 15162 and 15168).
- Due to substantial new information not known at the time the Previous CEQA Documents were certified (per CEQA Guidelines Section 15162, 15168, 15183, or 15183.3).

The City of Oakland established SCAs and Uniformly Applied Development Standards after certification of the 2005 Arcadia Park EIR and the 1998 LUTE EIR. The City also recently adopted an updated version of the SCAs from those included in the 2010 Housing Element EIR and 2014 Addendum. The City's SCAs are incorporated into and applied to new and changed projects as conditions of approval, regardless of a project's environmental determination. The SCAs incorporate policies and standards from various adopted plans, policies, and ordinances. The implementation of these policies and standards has been found to substantially mitigate environmental effects. The SCAs are adopted as requirements of an individual project when it is approved by the City and are designed to, and would, substantially mitigate environmental effects.

The 2019 project is required to comply with applicable mitigation measures identified in the Program EIRs as modified, and in some cases wholly replaced, to reflect the City's current standard language and requirements of its SCA.[17] The project sponsor has agreed to incorporate and/or implement the required mitigation measures and SCAs as part of the 2019 project. A list of the mitigation measures and SCAs is included in Attachment A and is incorporated by reference into the CEQA Checklist analysis.

If the CEQA Checklist (including Attachment A) inaccurately identifies or fails to list a mitigation measure or SCA, the applicability of that mitigation measure or SCA to the project is not affected. If the language describing a mitigation measure or SCA included in the CEQA Checklist (including Attachment A) is inaccurately transcribed, the language of the mitigation measure as set forth in the Program EIRs or City of Oakland SCAs shall control.

[17] These are development standards that are incorporated into projects as SCAs, regardless of a project's environmental determination, pursuant, in part, to CEQA Guidelines Section 15183. As applicable, the SCAs 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 of the SCAs are applied, based on the zoning district, community plan, and the type(s) of permit(s)/approvals(s) required for the project. Depending on the specific characteristics of the project type and/or project site, the City will determine which SCA applies to each project.

B. Attachments

The following attachments are included at the end of this CEQA Checklist:

A. Standard Conditions of Approval and Mitigation Monitoring and Reporting Program

B. Criteria for Use of Addendum, per CEQA Guidelines Sections 15162, 15164, and 15168

C. Project Consistency with Community Plans or Zoning, per CEQA Guidelines Section 15183

D. Infill Performance Standards, per CEQA Guidelines Section 15183.3

E. CalEEMod Outputs, Air Quality and Greenhouse Gas Estimates and Health Risk Screening Analysis

F. Traffic Noise Outputs

G. Traffic and Transportation Analysis

A. AESTHETICS, SHADOW, AND WIND

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Have a substantial adverse effect on a public scenic vista; substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, located within a state or locally designated scenic highway; substantially degrade the existing visual character or quality of the site and its surroundings; or create a new source of substantial light or glare that would substantially and adversely affect day or nighttime views in the area.	■	❒	❒
b. Introduce landscape that would now or in the future cast substantial shadows on existing solar collectors (in conflict with California Public Resource Code sections 25980-25986); or 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.	■	❒	❒
c. Cast shadow that substantially impairs the beneficial use of any public or quasi-public park, lawn, garden, or open space; or cast shadow on an historical resource, as defined by CEQA Guidelines Section 15064.5(a), such that the shadow would materially impair the resource's historic significance.	■	❒	❒
d. 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.	■	❒	❒

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
e. Create winds that exceed 36 miles per hour for more than 1 hour during daylight hours during the year. The wind analysis is only required 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.	■	❐	❐

Previous CEQA Documents Findings

Scenic vistas, scenic resources, visual character, light and glare, wind, and shadow were analyzed in the 1998 LUTE EIR, 2010 Housing Element EIR, and 2014 Addendum which found that the impacts to these resources would be less than significant. The 1998 LUTE EIR identified mitigation measures that are functionally equivalent to the current SCAs to reduce certain potential aesthetic effects to less-than-significant levels, and the 2010 Housing Element EIR cited SCAs that would ensure less-than-significant visual quality effects.

The Arcadia Park EIR found that implementation of the Arcadia Park project would result in no significant impacts related to aesthetics, shadow, or wind and no mitigation measures or SCAs were required.

Project Analysis

Scenic Vistas, Scenic Resources, Visual Character, and Light and Glare (Criterion A.a)

Consistent with the findings of the Arcadia Park EIR, the project site does not contain any scenic resources, as it is currently a vacant lot with sparse vegetation, foundations of former buildings, and assorted piles of construction debris. Additionally, there are no scenic vistas in the project vicinity.

The project vicinity is surrounded by industrial and residential uses with elevated BART train tracks and at-grade freight train tracks immediately to the west of the site. The visual character of the area is quite varied with the cohesive Arcadia Park residential development (two-stories), undeveloped sites, industrial uses with warehouse building (approximately 20 to 30 feet tall) and stacked shipping containers (approximately 43 feet tall), railroad tracks, and the overhead BART tracks (approximately 40 feet tall), as shown on Figure 4. The 2019 project includes townhomes, and multi-family apartment buildings ranging in height three to five stories with a maximum height of 60 feet. Although the building height is higher than the 35 feet maximum height permitted under the zoning, and the use has been modified to mixed-use residential primarily single-family units and detached condominium units analyzed in the Arcadia Park EIR, these modifications would not result in a significant impact related to visual character. The development of this project would change the visual character of the area by continuing residential development to San Leandro Boulevard and introducing taller buildings. However, these changes are common with development of vacant sites.

Although the maximum height allowed in the HBX-1 zone is usually 35 feet, the 2019 project's maximum height of 60 feet is still within compliance of the HBX-1 zoning regulations because of its adjacency to the BART right-of-way. Section 17.65.100.3 (B) of the City of Oakland's Planning Code states that structures located on lots immediately adjacent to above-ground BART rights-of-way and within the closest 125 feet of the BART right-of-way are eligible for a 75-foot height limit. Parcels A, B, and C, which, as proposed, all exceed the 35-foot height limit in the HBX-1 zone, are located within 125 feet of the BART right-of-way and are thus eligible for the 75-foot height limit. Although Parcel D exceeds the 35-foot height limit and is over 125 feet from the BART right-of-way, height limits may be waived or modified as part of the PUD permitting process.[18]

The 2019 project would improve the visual character of the area with landscaping such as an entry plaza, a linear park, a woonerf, buffer planting, and streetscaping including a pedestrian paseo, pedestrian lighting, steps and handrails, and bike racks. The 2019 project would serve to improve the aesthetic compatibility of the site with the adjacent single-family residential area. As a result, the 2019 project would not substantially degrade the existing visual character or quality of the site and its surroundings.

The construction of the 2019 project would introduce new sources of light, such as downward facing street lamps along rights-of-ways within the project site, and glare, such as reflections from glass windows. However, the 2019 project's exterior surfaces do not include large areas of reflective surface and the 2019 project would be required to comply with SCA-AES-4: Lighting (#19), which would ensure that any impacts related to light and glare are mitigated to less-than-significant levels.

Shade and Shadow (Criterion A.b through A.d.)

The Arcadia Park EIR found that no significant impacts regarding shade and shadow would occur and that no mitigation measures or SCAs would be necessary. Under the City of Oakland CEQA Thresholds of Significance, a project would have a significant shadow impact if it were to:

[18] Oakland Planning Code 17.142.100(G)

- introduce landscape that would cast substantial shadows on existing solar collectors;
- cast a shadow that substantially impairs the function of a building using passive solar energy;
- cast a shadow that substantially impairs the beneficial use of any public or quasi-public park, lawn, garden, or open space; or
- cast a shadow on a historic resource 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 and that justify its designation as a historic resource.

Several of the existing single-family homes adjacent to the 2019 project's eastern boundary along Dunbar Drive utilize either passive solar heating or solar photovoltaic cells located on the homes' roofs. The 2019 project's buildings that are closest to these solar collectors are the townhomes that have a maximum height of 35 feet. Furthermore, these townhomes would be separated from the existing single-family homes and would be set back from the Dunbar Drive right-of-way, resulting in a separation of at least 65 feet. Buildings of this height and at this distance would not affect the use of rooftop solar heating or solar photovoltaic cells.

The Fast Lane Trucking site has stacks of shipping containers along its eastern boundary that are at least 43 feet in height and separated from the existing single-family homes by the Ellington Drive right-of-way. Since solar collectors and solar photovoltaic cells are operable adjacent to the Fast Lane Transportation site along Ellington Way, they would still be operable along Dunbar Drive after the construction of the 2019 project's townhomes, which are both shorter than the shipping container stacks and separated from existing single-family homes by a greater distance than the Fast Lane Transportation site.

As part of the Arcadia Park project, Pulte Homes constructed a public lawn, picnic area, and playground that is located on either side of Dunbar Drive at its intersection with Tubman Drive. This picnic area is separated from the 2019 project only by Tubman Drive and Ellington Way. There is the potential for the 2019 project to cast shade and shadow on this public picnic area, which is located to the east of Parcel D. However, the proposed building on Parcel D, which would be closest to these quasi-public areas, would be no taller than 45 feet, and would be separated from the picnic area by the public right-of-way (Ellington Drive) and a setback. Together, Ellington Way and the setback would create a separation of at least 50 feet. Buildings of this height, at this distance from the picnic area, would not cast shadows significant enough to substantially impair beneficial use of the picnic area. Lastly, there are no known historic resources at, or near, the project site that would be affected by shadows cast by the construction of the 2019 project's buildings. Please see *Section D, Cultural Resources* for a further discussion of historic resources.

Wind (Criterion A.e)

The City of Oakland requires wind modeling for proposed structures that are 100 feet tall or greater (measured to the roof) and fulfill one of the following conditions: (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 in Downtown. Downtown is defined in the LUTE as the area generally bounded by 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. The 2019 project does not exceed 100 feet in height, nor does the project site lie within the area requiring modeling for evaluation of wind impacts: it is not adjacent to the Oakland Estuary, Lake Merritt, or San Francisco Bay, nor is it located in Downtown. Accordingly, no wind analysis is needed for this project.

Conclusion

Based on an examination of the analysis, findings, and conclusions of the Arcadia Park EIR and the Program EIRs, implementation of the 2019 project would not substantially increase the severity of significant aesthetic impacts identified in the Arcadia Park EIR or the Program EIRs, nor would it result in new significant impacts related to aesthetics, shadow, or wind that were not identified in those EIRs despite the increase in height between what was analyzed in the Arcadia Park EIR and what is proposed for the 2019 project. The 2019 project would involve construction of residential buildings on a formerly industrial vacant lot adjacent to single-family homes, improving the aesthetics of the site to be more compatible with the surrounding residential uses. The 2019 project would be required to comply with the City of Oakland's SCAs: SCA-AES-1: Trash and Blight Removal (#16), SCA-AES-2: Graffiti Control (#17), SCA-AES-3: Landscape Plan (#18), SCA-AES-4: Lighting (#19) and SCA-AES-5: Public Art for Private Development (#92), which would ensure that any aesthetic impacts resulting from the 2019 project would be equal or less in severity than those impacts identified in the Program EIRs or Arcadia Park EIR.

B. AIR QUALITY

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. During project construction result in average daily emissions of 54 pounds per day of ROG, NOX, or $PM_{2.5}$ or 82 pounds per day of PM_{10}; during project operation result in average daily emissions of 54 pounds per day of ROG, NOX, or $PM_{2.5}$, or 82 pounds per day of PM_{10}; result in maximum annual emissions of 10 tons per year of ROG, NOX, or $PM_{2.5}$, or 15 tons per year of PM_{10}.	■	❒	❒
b. For new sources of Toxic Air Contaminants (TACs), during either project construction or project operation expose sensitive receptors to substantial levels of TACs under project conditions resulting in an increase in cancer risk level greater than 10 in one million, (b) a noncancer 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 microgram per cubic meter; or, under cumulative conditions, resulting in (a) a cancer risk level greater than 100 in a million, (b) a noncancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 microgram per cubic meter; or expose new sensitive receptors to substantial ambient levels of Toxic Air Contaminants (TACs) resulting in (a) a cancer risk level greater than 100 in a million, (b) a noncancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 microgram per cubic meter.	■	❒	❒

Previous CEQA Document Findings

Air quality was analyzed in the Program EIRs. The 1998 LUTE EIR identified mitigation measures to reduce the impact of criteria air pollutant emissions from construction equipment and stationary sources to a less-than-significant level. However, the 1998 LUTE EIR found that increased criteria air pollutant emissions from increased traffic, including reduced emissions after implementation of identified mitigation measures, would result in a significant and unavoidable impact. The 1998 LUTE EIR cited a significant and unavoidable impact associated with policy inconsistencies with the City's Clean Air Plan (also discussed below in *Section I, Land Use, Plans and Policies),* resulting from significant and unavoidable increases in criteria pollutants from increased regional automobile traffic. It identified mitigation measures that largely align with current City of Oakland SCAs involving Transportation Demand Management (TDM) and apply to all projects within the City of Oakland. The 1998 LUTE EIR did not quantify or address cumulative health risks and as such, analysis was not required when that EIR was prepared. The 2010 Housing Element EIR identified significant impacts related to area and mobile sources of air pollutants and diesel particulate matter. However, these impacts were determined to be less than significant with the implementation of applicable SCAs.

The Arcadia Park EIR determined that construction activities at the 2019 project site would generate pollutant emissions that would have a less-than-significant impact in nearby sensitive receptors with implementation of Mitigation Measure AIR-1 to control dust emissions. The Arcadia Park EIR found all other air quality impacts related to plan consistency, violation of air quality standards, odor generation, and pollutant emissions to be less than significant.

The Arcadia Park EIR did not compare the Arcadia Park project's emissions of criteria air pollutants and toxic air contaminants (TACs) with the City of Oakland's current thresholds of significance. These potential impacts from the 2019 project are analyzed, below.

Project Analysis

The 2019 project is in the San Francisco Bay Area Air Basin (SFBAAB), which is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). The BAAQMD has adopted thresholds of significance to assist lead agencies in the evaluation and mitigation of air quality impacts under CEQA.[19] The BAAQMD's thresholds—which were utilized by the City of Oakland in establishing its own thresholds of significance—established levels at which emissions of ozone precursors (i.e., reactive organic gases [ROGs] and nitrogen oxides [NOx]), particulate matter, carbon monoxide (CO), TACs, and odors could cause significant air quality impacts. Two fractions of particulate matter emissions are regulated based on aerodynamic resistance: those with diameters equal to or less than 10 microns (PM_{10}) and those with diameters equal to or less than 2.5 microns ($PM_{2.5}$). The BAAQMD's thresholds of significance adopted by the City of Oakland that are used in this CEQA analysis are summarized in Table 4 below.

[19] Bay Area Air Quality Management District (BAAQMD), 2017. CEQA Air Quality Guidelines. May.

TABLE 4 CITY'S THRESHOLDS OF SIGNIFICANCE

Impact Analysis	Pollutant	Threshold of Significance
Regional Air Quality (Construction)	ROG	54 pounds/day (average daily emission)
	NOx	54 pounds/day (average daily emission)
	Exhaust PM_{10}	82 pounds/day (average daily emission)
	Exhaust $PM_{2.5}$	82 pounds/day (average daily emission)
Regional Air Quality (Operation)	ROG	54 pounds/day (average daily emission) 10 tons/year (maximum annual emission
	NOx	54 pounds/day (average daily emission) 10 tons/year (maximum annual emission
	Exhaust PM_{10}	82 pounds/day (average daily emission) 15 tons/year (maximum annual emission)
	Exhaust $PM_{2.5}$	82 pounds/day (average daily emission) 15 tons/year (maximum annual emission)
Local Community Risks and Hazards (Operation and/or Construction)	Fugitive dust (PM_{10} and $PM_{2.5}$)	Best management practices (BMPs)
	Exhaust $PM_{2.5}$ (project)	0.3 $\mu g/m^3$ (annual average)
	TACs (project)	Cancer risk increase > 10 in one million Chronic hazard index > 1.0
	Exhaust $PM_{2.5}$ (cumulative)	0.8 $\mu g/m^3$ (annual average)
	TACs (cumulative)	Cancer risk > 100 in one million Chronic hazard index > 10.0

Notes: $\mu g/m^3$ = micrograms per cubic meter
Source: BAAQMD, 2017. CEQA Air Quality Guidelines, May.

Criteria Pollutant Emissions (Criteria B.a)

As discussed above, the Arcadia Park EIR did not compare the Arcadia Park project's emissions of criteria air pollutants with the current City of Oakland's thresholds of significance, shown in Table 4. As discussed in *Chapter III, Project Description*, the size, and layout of the 2019 project varies from what was proposed in the Arcadia Park EIR.

The BAAQMD currently recommends using the most recent version of the California Emissions Estimator Model (CalEEMod 2016.3.2) to estimate construction and operational emissions of pollutants for a proposed project. CalEEMod uses widely accepted models for emission estimates combined with appropriate default data for a variety of land use projects that can be used if site-specific information is not available. The default data (e.g., type and power of construction equipment) are supported by substantial evidence provided by regulatory agencies and a combination of statewide and regional surveys of existing land uses. The primary input data used to estimate emissions associated with construction and operation of the 2019 project is summarized in Table 5. A copy of the CalEEMod report for the 2019 project, which summarizes the input parameters, assumptions, and findings, is provided in Attachment E: Air Quality and Health Risk Screening Analysis; CalEEMod.

TABLE 5 SUMMARY OF LAND-USE INPUT PARAMETERS FOR CALEEMOD

Land-Use Type[a]	CalEEMod Land-Use Type	Units	Unit Amount
Work/Live Units (Work Area)	General Office Building	Square Feet	19,000
Work/Live Units (Work Area)	Regional Shopping Center	Square Feet	19,000
Work/Live Units (Live Area)	Apartments Mid Rise	Dwelling Units	52*
Residential	Apartments Mid Rise	Dwelling Units	230*
	Condo/Townhouse	Dwelling Units	122
Commercial	High-Turnover (Sit-Down) Restaurant	Square Feet	2,500
Parking	Parking Lot	Space	519

Note: The proposed project footprint would be about 10 acres.
Land uses are consistent with Section M. Transportation and Circulation. *The air quality, greenhouse gas, and noise analysis completed for this CEQA analysis per plans received on December 10, 2018 considered more work/live units as well as more parking spaces than what is shown on newer plans submitted on May 26, 2020 The number of apartment units has increased. The increase in the sum of numbers of apartment units, work/live, and live/work units in the newer plans is negligible compared with the plans on which the air quality, greenhouse gas, noise analysis were based due to the reduction in commercial square footage. The commercial area with a CalEEMod Land-Use type Sit-Down Restaurant has remained the same as well as the number of townhomes. The analysis in this section provides a worst-case analysis and a revised analysis is not needed.

Criteria Air Pollutant Emissions from Construction

Project construction activities would generate criteria pollutant emissions that could adversely affect regional air quality. Construction activities for the 2019 project would include demolition, grading, building construction, paving, and applications of architectural coatings. The primary pollutant emissions of concern during project construction would be ROG, NO_x, PM_{10}, and $PM_{2.5}$ from the exhaust of off-road construction equipment and on-road vehicles (worker vehicles, vendor trucks, and haul trucks) and fugitive ROG emissions from the application of architectural coatings and paving. In addition, fugitive dust emissions of PM_{10} and $PM_{2.5}$ would be generated by soil disturbance and demolition activities, which could adversely affect local air quality. Emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$ during project construction were estimated using the CalEEMod input parameters summarized in Tables 5 and 6.

TABLE 6 SUMMARY OF CONSTRUCTION INPUT PARAMETERS FOR CALEEMOD

CalEEMod Input Category	Construction Assumptions and Changes to Default Data
Construction Phase	CalEEMod default assumptions for construction phase duration and equipment were used to estimate the total hours of equipment operation (and associated emissions) required to construct the project. Construction of the project was assumed to begin as early as 2021 this is a conservative assumption because statewide emission standards for off-road diesel equipment are required to improve over time.
Engine Tier	Project construction would use off-road equipment with Tier 4 Final engines, if available.
Material Movement	Assuming up to 5 feet of excavation across 80 percent of the project site, the maximum expected soil export is about 65,000 cubic yards.

Demolition	Assuming the remaining building debris on the project site is from former pavement and building foundations, the maximum expected building debris export is about 10,000 tons.

Notes: Default CalEEMod data used for all other parameters not described.
Source: Baseline Environmental Consulting, 2019 (Attachment E: Air Quality and Health Risk Screening Analysis; CalEEMod).

The total emissions estimated during construction were averaged over the default CalEEMod construction workdays (400 days) and compared to the City's Thresholds of Significance. As shown in Table 7, the 2019 project's estimated uncontrolled construction emissions for ROG, NOx, and exhaust PM_{10} and $PM_{2.5}$ were below the applicable thresholds. Therefore, construction of the 2019 project would have a less-than-significant impact on regional air quality.

TABLE 7 ESTIMATED 2019 PROJECT CONSTRUCTION EMISSIONS (AVERAGE POUNDS PER DAY)

Emission Scenario	ROG	NOx	Exhaust PM_{10}	Exhaust $PM_{2.5}$
Uncontrolled Emissions (without all Tier 4 Engines)	24	36	1.2	1.1
Thresholds of Significance	54	54	82	54
Exceed Threshold?	**No**	**No**	**No**	**No**

Source: Baseline Environmental Consulting, 2019 (Attachment E: Air Quality and Health Risk Screening Analysis; CalEEMod).

The generation of fugitive dust PM_{10} and $PM_{2.5}$ from soil disturbance and demolition activities could adversely affect local air quality. Neither BAAQMD nor the City has a quantitative threshold of significance for fugitive dust PM_{10} and $PM_{2.5}$ emissions. However, the BAAQMD and the City considers implementation of best management practices (BMPs) to control dust during construction sufficient to reduce potential impacts to a less-than-significant level. Because development of the 2019 project is more than four acres in size and would involve extensive soil export (more than 10,000 cubic yards), the City's enhanced dust-control measures for construction described under SCA-AIR-1: Dust Controls – Construction Related (#20), would apply. Implementation of the enhanced dust-control measures described under SCA-AIR-1 would satisfy the BAAQMD's requirement for BMPs during construction. These BMPs include, but are not limited to, watering construction sites, covering loose materials, suspending certain construction activities under windy conditions, and applying soil stabilizers. This measure also supersedes the dust control measures described under Mitigation Measure AIR-1of the Arcadia Park EIR. Because implementation of dust-control measures under SCA-AIR-1 would satisfy the City's threshold of significance, the impact on local air quality from dust generated during construction of the 2019 project would be less than significant.

In addition to the dust emission controls required under SCA-AIR-1, the 2019 project must comply with SCA-AIR-2: Criteria Air Pollutant Controls – Construction Related (#21). Because average daily emissions of the 2019 project construction would not exceed the

City's thresholds for construction activities (Table 7), the 2019 project is only required to implement the basic control measures under SCA-AIR-2, such as limiting vehicle idling times, properly tuning and maintaining all construction equipment, and using electricity for portable equipment. 2019 Project construction would not involve demolition or renovation of structures known to contain or maintain asbestos and is therefore not subject to the applicable laws and regulations regarding structures containing asbestos materials as described under the City's SCA #26: Asbestos in Structures. Since naturally-occurring asbestos has not been mapped in the vicinity of the project, the dust mitigation measures for asbestos described under the City's SCA #27: Naturally-Occurring Asbestos would not apply to the project. With implementation of SCA-AIR-1 and SCA-AIR-2, construction of the 2019 project would not substantially increase the severity of significant impacts identified in the Arcadia Park EIR, nor would it result in new significant impacts related to criteria pollutant emissions that were not identified in the Arcadia Park EIR.

Criteria Air Pollutant Emissions from Operation

Operation of the 2019 project would generate criteria pollutant emissions that could potentially affect regional air quality. The primary pollutant emissions of concern during project operation would be ROG, NOx, and exhaust PM_{10} and $PM_{2.5}$ from mobile sources, energy use, and area sources (e.g., consumer products, architectural coatings, and landscape maintenance equipment). Operation of the 2019 project was assumed to begin as early as 2021 which is the earliest expected year of operation. Since statewide vehicle emission standards are required to improve over time in accordance with the Pavley (Assembly Bill 1493) and Low-Emission Vehicle regulations (Title 13, California Code of Regulations, and Section 1961.2), estimating emissions for the earliest year of operation provides the maximum expected annual emissions. Additional 2019 project-specific information used to calculate operation emissions in CalEEMod, including changes to default data, is summarized in Table 8.

TABLE 8 SUMMARY OF OPERATION INPUT PARAMETERS FOR CALEEMOD

CalEEMod Input Category	Operation Assumptions and Changes to Default Data
Vehicle Trips	Daily trip rates for each type of land use were adjusted according to the project traffic analysis. These trip estimates account for a 23.1 percent trip reduction based on the City of Oakland's Transportation Impact Review Guidelines for development in an urban environment more than 1.0 miles from a Bay Area Rapid Transit Station and over 10,000 people per square mile population density.
Woodstoves and Fireplaces	Assumed no woodstoves are included in the 2019 project and all the fireplaces are natural gas-based.

Notes: Default CalEEMod data used for all other parameters not described.
Source: Baseline Environmental Consulting, 2019 (Attachment E: Air Quality and Health Risk Screening Analysis; CalEEMod).

The estimated maximum annual emissions and average daily emissions during the operational phase of the 2019 project are compared to the City's thresholds of significance in Table 9. The estimated operational emissions for ROG, NOx, and exhaust PM_{10} and $PM_{2.5}$ were below the City's Thresholds of Significance and, therefore, operation of the 2019 project would have a less-than-significant impact on regional air quality. Operation of the 2019 project would not substantially increase the severity of significant impacts identified in the Arcadia Park EIR, nor would it result in new significant impacts related to criteria pollutant emissions during construction that were not identified in the Arcadia Park EIR.

TABLE 9 ESTIMATED OPERATION EMISSIONS

	Maximum Annual Emissions (Tons)				**Average Daily Emissions (Pounds)**			
Emissions Scenario	**ROG**	**NO_x**	**Exhaust PM_{10}**	**Exhaust $PM_{2.5}$**	**ROG**	**NO_x**	**Exhaust PM_{10}**	**Exhaust $PM_{2.5}$**
Area	2.85	0.06	0.02	0.02	15.60	0.32	0.10	0.10
Energy	0.03	0.28	0.02	0.02	0.18	1.56	0.12	0.12
Mobile	0.75	4.87	0.03	0.03	4.11	26.67	0.15	0.14
Total Project Emissions	3.6	5.2	<0.1	<0.1	19.9	28.6	0.4	0.4
Thresholds of Significance	10	10	15	10	54	54	82	54
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Source: Baseline Environmental Consulting, 2019 (Attachment E: Air Quality and Health Risk Screening Analysis; CalEEMod).

Toxic Air Contaminants (Criteria B.b)

Exposure of Sensitive Receptors to Project TAC Emissions

2019 project construction would generate diesel particulate matter (DPM) and $PM_{2.5}$ emissions from the exhaust of off-road diesel construction equipment and on-road vehicles (worker, vendor, and haul trucks) accessing the 2019 project site. DPM and $PM_{2.5}$ from diesel-powered engines are a complex mixture of soot, ash particulates, metallic abrasion particles, volatile organic compounds, and other components that can penetrate deeply into the lungs and contribute to a range of health problems. In 1998, the California Air Resources Board identified particulate matter from diesel-powered engines as a TAC based on its potential to cause cancer and other adverse health effects.[20]

[20] California Air Resources Board, 1998. Initial Statement of Reasons for Rulemaking; Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, June.

The emissions of DPM and $PM_{2.5}$ from diesel exhaust during project construction and operation could pose a health risk to nearby sensitive receptors. The term “sensitive receptor” refers to a location where individuals are more susceptible to poor air quality. Sensitive receptors include schools, convalescent homes, and hospitals because the very young, the old, and the infirm are more susceptible than the rest of the public to air quality-related health problems. Residential areas are also considered sensitive to poor air quality because people are often at home for extended periods, thereby increasing the duration of exposure to potential air contaminants. The BAAQMD recommends evaluating the potential health risks to sensitive receptors within 1,000 feet of a proposed project that could be exposed to TACs, such as DPM and $PM_{2.5}$. The nearest sensitive receptor to the project site is a single-family residence about 50 feet north and northeast of the project site.

The 2019 project is subject to the City’s SCA-AIR-3: DPM Controls – Construction Related (#23) because the project would involve construction of more than 100 dwelling units. SCA-AIR-3 requires a project to either: (1) prepare a health risk assessment (HRA) to determine the health risk to sensitive receptors exposed to DPM from project construction emissions, or (2) equip all off-road diesel equipment with the most effective Verified Diesel Emission Control Strategies (VDECS), which would reduce DPM emissions from construction activity to the maximum extent technologically feasible. Tier 4 engines automatically meet the requirement of the most effective VDECS. The project applicant is committed to using Tier 4 engines for all off-road diesel construction equipment, consistent with SCA-AIR-3: DPM Controls – Construction Related (#22), if available. The use of Tier 4 engines would reduce DPM and $PM_{2.5}$ emissions and their associated health risks during project construction by over 90 percent (Attachment E: Air Quality and Health Risk Screening Analysis; CalEEMod). With the implementation of SCA-AIR-3, construction emissions of TACs would be reduced to the maximal extent. In the event, Tier 4 engines are not available, SCA AIR-3 would require the project sponsor to conduct a Health Risk Analysis and implement any measure identified to ensure that DPM from project construction emissions are reduced to the extent technologically feasible. Therefore, TAC emissions during project construction would not result in substantial increases in health risk levels at nearby sensitive receptors that would exceed the City’s thresholds of significance consistent with the findings of the Arcadia Park EIR.

Project operation would not include any new stationary source that could generate TAC emissions, such as a diesel emergency generator. Therefore, 2019 project operation would not expose sensitive receptors to increased levels of TACs. This impact is less than significant and would not be more severe than what was identified in the Arcadia Park EIR.

Exposure of Future Residents to TACs

Future residents on the project site could be exposed to existing and reasonably foreseeable future sources of TAC emissions. CEQA does not require the analysis or mitigation of potential effects that the existing environment may have on a project (with certain exceptions). However, the 2019 project is required to prepare an HRA under SCA-AIR-4: Exposure to Air Pollution (TACs) (#23), because the project would include residential uses within 1,000 feet of roadways with significant traffic (more than 10,000 vehicles a day).

The BAAQMD recommends evaluating the potential cumulative health risks to sensitive receptors from existing and reasonably foreseeable future sources of TACs.[21] The BAAQMD's online screening tools were used to provide conservative estimates of how much existing and foreseeable future TAC sources would contribute to cancer risk, chronic hazard index (HI), and $PM_{2.5}$ concentrations at the maximally exposed individual resident (MEIR) at the project site. The individual health risks associated with each source are added up to find the cumulative impact at the future MEIR.

Based on the BAAQMD's Stationary Source Screening Analysis Tool[22], six existing stationary sources of TAC emissions were identified within 1,000 feet of the MEIR (Table 10 and Figure 8). There are no foreseeable future projects that would include new stationary sources within 1,000 feet of the MEIR.[23] Preliminary health risk screening values at the MEIR from the existing stationary sources were determined using the Stationary Source Screening Analysis Tool. In accordance with guidance from the BAAQMD, the cancer risk values were adjusted using a factor of 1.374 to account for the most recent health risk parameters recommended by the Office of Environmental Health Hazard Assessment. [24]

The BAAQMD recommends estimating health risk screening values for major roadways with an average annual daily traffic (AADT) volume greater than 10,000 vehicles per day. Based on review of 2020 AADT volumes forecasted by Alameda County Transportation Commission (CTC),[25] there is one major roadway (98th Avenue) with an AADT volume greater than 10,000 vehicles per day within 1,000 feet of the MEIR (Table 10 and Figure 8). The health risk screening values at the MEIR from 98th Avenue were estimated using

[21] BAAQMD, 2017. CEQA Air Quality Guidelines. May.

[22] BAAQMD, 2012. Stationary Source Screening Analysis Tool, May 30.

[23] The Oakland Conduit, 2019. Oakland Development Map. Available at: https://www.oaklandconduit.com/development_map. Accessed on January 3.

[24] BAAQMD, 2018. Personal communication between Ivy Tao from Baseline Environmental Consulting and Alison Kirk from the BAAQMD. September 10.

[25] Alameda County Transportation Commission (CTC), 2014. Countywide Travel Demand Model. Planning Area 1; 2020 Daily Model Vehicle Volumes. July.

Source: Bing Aerial, 2019; BASELINE Environmental, 2019

Figure 8
Project Site and Toxic Air Contaminant Sources

the BAAQMD's Roadway Screening Analysis Calculator.[26] In accordance with guidance from the BAAQMD, the resulting cancer risk was adjusted using a factor of 1.374 to account for the most recent health risk parameters recommended by the Office of Environmental Health Hazard Assessment.[27]

As shown in Table 10, the screening analysis, which is based on conservative assumptions, indicates that the cumulative excess cancer risk, chronic HI, and $PM_{2.5}$ concentrations at the future MEIR would be less than the City's cumulative thresholds. Therefore, the project would not expose new sensitive receptors to substantial levels of TACs. This impact is less than significant and would not be more severe than what was identified in the Arcadia Park EIR.

TABLE 10: CUMULATIVE HEALTH RISKS AT FUTURE MEIR

Sources	Source Type	Cancer Risk (10^{-6})	Chronic Hazard Index	$PM_{2.5}$ (μg/m³)
Existing Stationary Sources				
First Lane Intermodal, LLC (Permit 11051)	Not Reported	<0.01	<0.01	<0.01
Agricultural Bag Mfg, Inc (Permit 17824)	Not Reported	<0.01	<0.01	<0.01
Sunrise Specialty Company (Permit 12826)	Not Reported	<0.01	<0.01	<0.01
Pacific Paper Tube, Inc (Permit 19044)	Not Reported	<0.01	<0.01	<0.01
Mirage Auto Body & Paint (Permit 12527)	Not Reported	<0.01	<0.01	<0.01
McGuire & Hester (Permit 19378)	Generator	<0.01	<0.01	<0.01
Existing Mobile Sources				
98th Avenue (14,949 AADT)	Major Roadway	12.4	NA	0.2
Cumulative Health Risks		12	<0.1	0.2
City of Oakland's Cumulative Thresholds		100	10.0	0.8
Exceed Cumulative Threshold?		**No**	**No**	**No**

Note: μg/m³ = micrograms per cubic meter
Source: AADT volumes reported by Alameda CTC, 2014. Health risk screening values derived from the BAAQMD's online Tools and Methodologies. Available at: http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools. Accessed January 2019.

[26] BAAQMD, 2015. Roadway Screening Analysis Calculator. 16 April.

[27] BAAQMD, 2018. Personal communication between Ivy Tao from Baseline Environmental Consulting and Alison Kirk from the BAAQMD. September 10.

Conclusion

Based on an examination of the analysis and the findings and conclusions of the Arcadia Park EIR, implementation of the 2019 project would not substantially increase the severity of significant impacts identified in the Arcadia Park EIR or other Program EIRs, nor would it result in new significant impacts related to construction and operational air pollutant emissions that were not identified in the Arcadia Park EIR or other Program EIRs.

Furthermore, with implementation of the City's SCAs, the 2019 project would not result in any significant project or cumulative impacts related to air quality. The following SCAs are applicable to the project: SCA-AIR-1: Dust Controls – Construction Related (#20) with enhanced controls, SCA-AIR-2: Criteria Air Pollutant Controls – Construction Related (#21), SCA-AIR-3: DPM Controls – Construction Related (#22), SCA-AIR-4: Exposure to Air Pollution (TACs) (#23). These SCAs are included in Attachment A: Standard Conditions of Approval and Mitigation Monitoring and Reporting Program.

C. BIOLOGICAL RESOURCES

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. 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 California Department of Fish and Game or U.S. Fish and Wildlife Service?	■	❐	❐
b. 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 California Department of Fish and Game or U.S. Fish and Wildlife Service?	■	❐	❐
c. 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?	■	❐	❐
d. 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?	■	❐	❐
e. Fundamentally conflict with any applicable habitat conservation plan or natural community conservation plan?	■	❐	❐
f. Fundamentally conflict with the City of Oakland Tree Protection Ordinance (Oakland Municipal Code (OMC) Chapter 12.36) by removal of protected trees under certain circumstances?	■	❐	❐
g. Fundamentally conflict with the City of Oakland Creek Protection Ordinance (OMC Chapter 13.16) intended to protect biological resources?	■	❐	❐

Previous CEQA Documents Findings

Special-status species, wildlife corridors, riparian and sensitive habitat, wetlands, and tree and creek restoration were analyzed in the Program EIRs, which found that effects to these topics would be less than significant. The 2010 Housing Element Update EIR cited applicable SCAs that would ensure less-than-significant biological resources impacts. The 1998 LUTE EIR identified no mitigation measures related to biological resource impacts.

The Initial Study prepared in association with the Arcadia Park EIR found that the project would have no impact on biological resources including special-status species, wildlife corridors, riparian and sensitive habitat, wetlands, and tree and creek restoration.

Project Analysis

Special-Status Species, Wildlife Corridors, Riparian and Sensitive Habitat, Wetlands (Criteria 3a through 3d)

At the time of the Arcadia Park EIR, the entire site was developed with industrial uses and the remaining site was covered with asphalt and no biological resources existed on-site. Since that time, the site has been cleared and remediated. Most the project site is covered with ruderal vegetation, soil, gravel, concrete rubble, crushed asphalt, and some remnants of concrete slabs/pavement in the southwest portion of the site, and no sensitive biological resources exist on-site. Wildlife that exist in the area has adapted to disturbed, urban conditions and would not be adversely affected by the implementation of the 2019 project.

Habitat Conservation Plans, Tree Protection, and Creek Protection (Criteria 3e through 3g)

There are no habitat conservation plans or natural community conservation plans applicable to the site in the LUTE or OSCAR Element of the Oakland General Plan. The site does not contain any protected trees under the City of Oakland's Protected Tree Ordinance. The mature Monterey Pine tree located on the northwest corner of the project site adjacent to the BART right-of-way does not fit the definition of a protected tree under the City of Oakland's Protected Tree Ordinance, given that there are less than five Monterey Pine trees on the site. However, a public posting of such trees and written notice of proposed tree removal would need to be submitted to the Office of Parks and Recreation.[28] Additionally, no creeks exist on the project site, and no off-site creeks would be affected by the 2019 project.

Conclusion

Consistent with the findings of the Arcadia Park EIR, the 2019 project would not result in any significant impacts related to biological resources. Based on an examination of the analysis, findings, and conclusions of the Arcadia Park EIR, implementation of the 2019 project would not substantially increase the severity of impacts identified in the Arcadia Park EIR, nor would the 2019 project result in new significant impacts related to biological resources that were not identified in the Program EIRs. The application of the City of Oakland's SCA-BIO-1: Tree Removal During Bird Breeding Season (#29) and SCA-BIO-2: Tree Permit (#30) would mitigate any potential impacts to biological resource to less-than-

[28] City of Oakland Municipal Code, Chapter 12.36, Protected Trees, Section 12.36.020, Definitions.

significant levels. No other SCAs related to biological resources are applicable to the 2019 project.

D. CULTURAL RESOURCES

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Cause a substantial adverse change in the significance of an historical resource as defined in CEQA Guidelines Section 15064.5. 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 an 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 (California Register), the National Register of Historic Places (National Register), Local Register, or historical resources survey form (DPR Form 523) with a rating of 1-5).	■	❒	❒
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5.	■	❒	❒
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	■	❒	❒
d. Disturb any human remains, including those interred outside of formal cemeteries.	■	❒	❒

Previous CEQA Documents Findings

Cultural resources, including historic, archaeological, and paleontological resources, were analyzed in the Program EIRs. The 2010 Housing Element EIR and 2014 Addendum found that all impacts related to historic resources, paleontological and archeological resources, and human remains would be less than significant and no mitigation measures would be required. The 1998 LUTE EIR identified impacts related to paleontological and archaeological remains, and demolition. However, with the implementation of mitigation measures that are functionally equivalent to current SCAs, these potential impacts were found to be less than significant.

Cultural resources, including historic, archaeological, and paleontological resources, were analyzed in the Arcadia Park EIR. The Arcadia Park EIR found that there would be a less-than-significant impact upon historic impacts, as the site did not contain any potentially historic resources. The previously existing structures on the site, which were part of the Fleischmann's Yeast Company plant, were demolished in 2003. The City did not consider these structures to be historically significant at the time.

The Arcadia Park EIR Initial Study identified potentially significant impacts to archeological, paleontological, geologic, and human remains resources unless mitigation measures were incorporated. Although the Arcadia Park EIR noted that no archaeological or paleontological resources are known to exist at the site, mitigation measures that are equivalent to current SCAs were identified that would mitigate any impacts to these resources to a less-than-significant level. Additionally, a records search at Northwest Information Center (Center) of the California Historic Resources Inventory System at Sonoma State University found that CA-ALA-52, a Native American archaeological site, is located within or adjacent to the Arcadia Park project site; however, with the implementation of mitigation measures that are functionally equivalent to current SCAs, these potential impacts were found to be less than significant. The Arcadia Park EIR found no historical resources as defined in CEQA Guidelines 15064.5 at the project site.

Project Analysis

Material Impairment of a Historical Resource (Criteria 4a)

Since the Arcadia Park EIR was certified, the project site has been cleared of all structures and is now a vacant lot with assorted piles of construction debris and no structures.

Consistent with the findings of the Arcadia Park EIR, implementation of the 2019 project would not cause any impacts to any on-site historic or potentially historic resources, and no mitigation measures are required.

Archaeological, paleontological, and geologic resources and human remains (Criteria 4b through 4d)

The 2019 project includes plans for cut-and-fill grading and excavation for the construction of below-grade foundations to support the multi-story structures. As described above, although there is a low possibility of identifying sub-surface historic resources in the project area, the Arcadia Park EIR did identify potentially significant impacts related to the disturbance of unknown prehistoric or historic archaeological, paleontological, and humans remains resources and recommended mitigation measures.

Since the certification of the Arcadia Park EIR, the City has adopted SCAs that are functionally equivalent to the mitigation measures described above and applicable to all development projects. The 2019 project would be required to implement SCA-CULT-1: Archaeological and Paleontological Resources – Discovery During Construction (#32), SCA-CULT-2 Archaeologically Sensitive Areas – Pre-Construction Measures (#33), and SCA-CULT-3: Human Remains – Discovery During Construction (#34).

Conclusion

Based on an examination of the Program EIRs and Arcadia Park EIR, implementation of the 2019 project would not substantially increase the severity of cultural impacts identified in the Program EIRs and Arcadia Park EIR, nor would it result in new significant impacts to cultural resources that were not identified in those EIRs. The 2019 project would be required to implement the following City of Oakland SCAs: SCA-CULT-1: Archaeological and Paleontological Resources – Discovery During Construction (#33), SCA-CULT-2: Archaeologically Sensitive Areas – Pre-Construction Measures (#34), and SCA-CULT-3: Human Remains – Discovery During Construction (#35), as identified in Attachment A. These SCAs would ensure that any impacts to archaeological, paleontological, and historic resources and human remains would be less than significant.

E. GEOLOGY, SOILS, AND GEOHAZARDS

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Expose people or structures to substantial risk of loss, injury, or death involving: ▪ 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; ▪ Strong seismic ground shaking; ▪ Seismic-related ground failure, including liquefaction, lateral spreading, subsidence, collapse; or ▪ Landslides.	■	❐	❐
b. 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; result in substantial soil erosion or loss of topsoil, creating substantial risks to life, property, or creeks/waterways.	■	❐	❐

Previous CEQA Documents Findings

Geology, soils, and geohazards were analyzed in the Program EIRs. The 2010 Housing Element EIR and 2014 Addendum found that all impacts related to geology, soils, and geohazards would be less than significant and no mitigation measures would be required. The 1998 LUTE EIR identified no significant impacts and cited no mitigation measures related to geology, soils, and geohazards.

The Initial Study prepared in association with the Arcadia Park EIR identified potentially significant impacts related to strong seismic ground shaking, liquefaction, expansive soils, and unknown fill, and cited one mitigation measure that is functionally equivalent to current SCAs to reduce these potential impacts to less-than-significant levels.

Project Analysis

Exposure to Risk of Loss, Injury, or Death Involving Fault Rupture, Seismic-Related Shaking, Liquefaction, Lateral Spreading, Subsidence, or Collapse, or Landslides (Criterion V.a)

The project site is not located within or adjacent to an Alquist-Priolo Earthquake Fault Zone.[29] Therefore, the 2019 project would have no impact related to fault rupture. However, the project site is in a seismically active region and the nearest active fault is the Hayward Fault, which is located approximately 2 miles northeast of the project site.[30] The project site would experience very strong shaking in the event of a magnitude 7.0 earthquake on the Hayward Fault and strong to very strong ground shaking in the event of an earthquake on the San Andreas Fault.

Specifically, the risk of ground-shaking impacts is reduced through adherence to the design and materials standards set forth in the 2016 California Building Code (CBC), which the 2019 project would be required to comply with. The 2016 CBC provides for stringent construction requirements on projects in areas of high seismic risk. The 2019 project would be required to conform with, or exceed, current best standards for earthquake-resistant construction in accordance with the 2016 CBC and with the generally accepted standards of geotechnical practice for seismic design in Northern California. The City of Oakland has amended the CBC requirements under Chapter 18 by adding Chapter 18B, which includes additional requirements related to grading permits and plans, erosion and sediment control, and soils reports.

The Arcadia Park EIR identified strong seismic ground shaking as a potentially significant impact. The Arcadia Park EIR indicated that implementation of Mitigation Measure GEO-1,[31] which required the Arcadia Park project to be built in compliance with all recommendations contained in the Geotechnical Investigation prepared by Lowney Associates dated June 15, 2004, would ensure that potential impacts related to geotechnical issues would be reduced to a less-than-significant level.

Current SCAs that are functionally equivalent to Mitigation Measure GEO-1 are described below. The 2019 project would be required to comply with the City's SCAs related to geology and soils prior to approval of construction-related permits. This includes SCA-GEO-1: Construction-Related Permit(s) (#36) which would require the project to comply with all standards, requirements, and conditions contained in construction–related codes, including but not limited to the Oakland Building Code and the Oakland Grading

[29] California Geological Survey, 2003. Earthquake Zones of Required Investigation, San Leandro Quadrangle, February 14.

[30] Ibid

[31] Mitigation Measure GEO-1 was referred to as Mitigation Measure VI.1 in the Initial Study included in Appendix A of the Arcadia Park EIR, and was referred to as Mitigation Measure GEO-1 in the Summary of Impacts and Mitigation Measures presented in Table I.1 of the Arcadia Park EIR.

Regulations, to ensure structural integrity and safe construction. Compliance with the 2016 CBC and applicable SCAs would reduce the impacts related to seismic-related shaking, lateral spreading, subsidence, or collapse to less-than-significant levels.

The 2019 project is located within a Seismic Hazard Zone susceptible to liquefaction as mapped by CGS[32]. During ground shaking, soils within liquefaction zones can lose strength and acquire a "mobility" sufficient to permit both horizontal and vertical movements. Therefore, the 2019 project would be required to comply with SCA-GEO-2: Seismic Hazards Zone (Landslide/Liquefaction) (#39), which requires the submission of a site-specific geotechnical report and implementation of all the recommendations for grading practices and project design contained in the report. Compliance with SCA-GEO-2 could be achieved by implementing the recommendations contained in the Geotechnical Investigation prepared by Lowney Associates, dated June 15, 2004. However, if those recommendations are no longer applicable to the 2019 project, a new site-specific geotechnical report would be required.

It is acknowledged that seismic hazards cannot be completely eliminated, even with site-specific geotechnical investigation/design and advanced building practices. However, compliance with the CBC and the SCAs for construction, as discussed above, would ensure that the 2019 project would be designed and constructed to account for and withstand seismic and geologic hazards which could have adverse effects on the 2019 project, thereby minimizing exposure of people and structures to substantial risk of loss, injury, or death during a large regional earthquake. Compliance with the 2016 CBC and applicable SCAs would reduce the impacts related to seismic-related shaking, lateral spreading, subsidence, or collapse to less-than-significant levels.

Expansive Soil, Erosion or Loss of Topsoil, Creating Substantial Risks to Life, Property, or Creeks/Waterways. (Criterion V.b)

Expansive soils are characterized by the potential for shrinking and swelling as the moisture content of the soil decreases and increases, respectively. Shrink-swell potential is influenced by the amount and type of clay minerals present and can be measured by the percent change of the soil volume.

The Arcadia Park EIR indicated that highly expansive soils were encountered beneath the fills at the project site and identified expansive soil as a potentially significant impact. The Arcadia Park EIR indicated that implementation of Mitigation Measure GEO-1 would ensure that potential impacts related to expansive soils would be reduced to a less-than-significant level.

[32] California Geological Survey, 2003. Earthquake Zones of Required Investigation, San Leandro Quadrangle, February 14.

2019 project plans would be designed in accordance with the 2016 CBC and recommendations of a site-specific geotechnical report as required by SCA-GEO-2: Seismic Hazards Zone (Landslide/Liquefaction) (#40), which would include measures that would address, as necessary, the potential for impacts related to expansive soils. Therefore, compliance with the existing regulations would ensure that the potential impacts associated with expansive soils would be less than significant.

Soil erosion, which is discussed in detail in *Section H*, *Hydrology and Water Quality*, could occur during project grading and construction. As described in *Section H*, compliance with the City's SCA-HYD-1: Erosion and Sedimentation Control Plan for Construction (#47) and compliance with the Construction General Permit, including preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) as required by SCA-HYD-2: State Construction General Permit (#49), would ensure that the 2019 project would have a less-than-significant impact related to erosion or the loss of top soil.

Conclusion

Based on an examination of the Program EIRs and the Arcadia Park EIR, the 2019 project would not result in any significant impacts related to geology, soils, and geohazards. Further, based on an examination of the analysis and the findings and conclusions of the Arcadia Park EIR, implementation of the 2019 project would not substantially increase the severity of potentially significant impacts identified in the Arcadia Park EIR, nor would it result in new significant impacts related to geology, soils, and geohazards that were not identified in the Arcadia Park EIR.

With implementation of the City's SCAs, the 2019 project would not result in any significant project or cumulative impacts related to geology, soils, and geohazards. No mitigation measures are required. Compliance with the City's SCAs, including SCA-GEO-1: Construction-Related Permit(s) (#36), SCA-GEO-2: Seismic Hazards Zone (Landslide/Liquefaction) (#39), SCA-HYD-1: Erosion and Sedimentation Control Plan for Construction (#47), and SCA-HYD-2: State Construction General Permit (#49), as discussed above, would ensure that the 2019 project would not result in significant impacts related to geology, soils, and geohazards.

F. GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment, specifically: ▪ For a project involving a stationary source, produce total emissions of more than 10,000 metric tons of CO2e annually. ▪ For a project involving a land use development, produce total emissions of more than 1,100 metric tons of CO2e annually AND more than 4.6 metric tons of CO2e 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 applicable plan, policy, or regulation adopted for the purposes of reducing greenhouse gas emissions.	■	❒	❒

Previous CEQA Documents Findings

Climate change and greenhouse gas (GHG) emissions were analyzed in the 2010 Housing Element EIR and the 2014 Addendum. The Program EIR evaluated potential plan- and project-level impacts related to GHG emissions and concluded that no significant impacts were identified, and no mitigation was required. Residential development under the Housing Element would not be required to undergo project specific GHG analysis.

Since the certification of the 1998 LUTE EIR, and Arcadia Park EIR, BAAQMD has revised its CEQA thresholds with respect to air quality and greenhouse gas. Due to a legal challenge to these thresholds, BAAQMD in 2014 withdrew its recommendation that lead agencies use these thresholds for project level greenhouse gas CEQA analysis, and they are therefore no longer appropriate to apply to the analysis of greenhouse gas emissions caused by the 2019 Project. Further, even if the BAAQMD CEQA thresholds for greenhouse gas were still in effect, they were expressly not retroactive, as BAAQMD's policy was to only apply the new thresholds to projects for which a notice of preparation is published, or environmental analysis begins, after June 2, 2010 (the effective date of the thresholds). So at no point did the BAAQMD CEQA thresholds regarding greenhouse gas apply to the 1998 LUTE EIR, or Arcadia Park EIR project.

The City of Oakland has adopted quantitative thresholds of significance recommended in the BAAQMD's 2011 CEQA Air Quality Guidelines[33] to evaluate potential environmental impacts from GHG emissions. These thresholds were designed to ensure compliance with the State's AB 32 GHG reduction goals. The 1998 LUTE EIR, and Arcadia Park EIR did not use thresholds of significance because neither the BAAQMD nor the City of Oakland had adopted thresholds to analyze potential impacts from GHG emissions at that time.

The BAAQMD and City of Oakland CEQA thresholds regarding greenhouse gas, and the information used to help develop these thresholds, do not represent "new information" as specifically defined under CEQA. The potential environmental impacts of greenhouse gas were known or could have been known when the 1998 LUTE EIR, and Arcadia Park EIR was prepared and certified. As a result, application of the BAAQMD and City of Oakland CEQA Guidelines and Thresholds for greenhouse gas to the 2019 project is not required. This is consistent with the First District Court of Appeal's ruling in *Concerned Dublin Citizens v. City of Dublin, 214 Cal.App.4th 1301 (2013).*

However, in the interest of fostering informed decision making, an evaluation of potential GHG and climate change impacts is included in the CEQA Checklist for the purpose of providing more information to the lead agency and the public. It does not serve as a criterion for evaluating CEQA impacts. Additionally, the project is subject to the City of Oakland's current SCAs. The City's applicable SCAs and Thresholds of Significance are described below under the analysis for the 2019 project, which demonstrates that no new or greater GHG impacts would result than analyzed in the Program EIRs and the Arcadia Park EIR.

Project Analysis

Greenhouse Gas Emissions Generation (Criteria F.a)

As described under *Section B, Air Quality*, the City of Oakland utilizes thresholds of significance recommended by the BAAQMD[34] to evaluate potential impacts to the environment from GHG emissions. The BAAQMD's thresholds of significance for GHG emissions, which are defined in terms of carbon dioxide equivalents (CO_2e), were

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[33] BAAQMD, 2011. California Environmental Quality Act Air Quality Guidelines. May.

[34] Bay Area Air Quality Management District (BAAQMD), 2017. CEQA Air Quality Guidelines. May.

designed to ensure compliance with the State's Assembly Bill (AB) 32 (Nunez, 2006) GHG reduction goals.

The BAAQMD recommends using the most current version of the California Emissions Estimator Model (CalEEMod 2016.3.2) to estimate construction and operation emissions for a land-use project. CalEEMod utilizes widely accepted models for emission estimates combined with appropriate default data for a variety of land-use projects that can be used if site-specific information is not available. The default data (e.g., emission factors) are supported by substantial evidence provided by regulatory agencies and a combination of statewide and regional surveys of existing land uses and resources. The primary input data used to estimate emissions associated with construction and operation of the 2019 project are summarized in Table 11. A copy of the CalEEMod report for the 2019 project, which summarizes the input parameters, assumptions, and findings, is provided in Attachment E: Air Quality, and Health Risk Screening Analysis; CalEEMod.

TABLE 11 SUMMARY OF LAND-USE INPUT PARAMETERS FOR CALEEMOD

Land-Use Type[a]	CalEEMod Land-Use Type	Units	Unit Amount
Work/Live Units (Work Area)	General Office Building	Square Feet	19,000
Work/Live Units (Work Area)	Regional Shopping Center	Square Feet	19,000
Work/Live Units (Live Area)	Apartments Mid Rise	Dwelling Units	52*
Residential	Apartments Mid Rise	Dwelling Units	230*
	Condo/Townhouse	Dwelling Units	122
Commercial	High-Turnover (Sit-Down) Restaurant	Square Feet	2,500
Parking	Parking Lot	Space	519

Note: The project footprint would be about 10 acres.
Land uses are consistent with Section M. Transportation and Circulation. The air quality, greenhouse gas, and noise analysis completed for this CEQA analysis per plans received on December 10, 2018 considered more work/live units as well as more parking spaces than what is shown on newer plans submitted on May 26, 2020 The number of apartment units has increased. The increase in the sum of numbers of apartment units, work/live, and live/work units in the newer plans is negligible compared with the plans on which the air quality, greenhouse gas, noise analysis were based due to the reduction in commercial square footage. The commercial area with a CalEEMod Land-Use type Sit-Down Restaurant has remained the same as well as the number of townhomes. The analysis in this section provides a worst-case analysis and a revised analysis is not needed .

Project construction was assumed to begin as early as 2021. Project operation was assumed to begin as early as 2022.Since statewide vehicle emission standards are required to improve over time in accordance with the AB 1493 (Pavley, 2002)) and Low-Emission Vehicle regulations[35] estimating emissions for the earliest year of operation provides the maximum annual emissions. Additional 2019 project-specific information used to calculate GHG emissions in CalEEMod, including changes to default data, is summarized in Table 12.

TABLE 12 SUMMARY OF PROJECT-SPECIFIC ASSUMPTIONS FOR CALEEMOD

CalEEMod Input Category	Assumptions and Changes to Default Data
Construction Phase	CalEEMod default assumptions for construction phase duration and equipment were used to estimate the total hours of equipment operation (and associated emissions) required to construct the project. Construction of the project was assumed to begin as early as 2020; this is a conservative assumption because statewide emission standards for off-road diesel equipment are required to improve over time.
Material Movement	Assuming up to 5 feet of excavation across 80 percent of the project site, the maximum expected soil export is about 65,000 cubic yards.
Demolition	Assuming the remaining building debris on the project site is from former pavement and building foundations, the maximum expected building debris export is about 10,000 tons.

[35] Title 13, California Code of Regulations, Section 1961.2

TABLE 12 SUMMARY OF PROJECT-SPECIFIC ASSUMPTIONS FOR CALEEMOD

CalEEMod Input Category	Assumptions and Changes to Default Data
Utility provider	The default CO_2 intensity factor reported for 2008 was updated to the most recent CO_2 intensity factor verified by a third party in 2016.[a]
Vehicle Trips	Daily trip rates for each type of land use were adjusted according to the project traffic analysis. These trip estimates account for a 23.1 percent trip reduction based on the City of Oakland's Transportation Impact Review Guidelines for development in an urban environment more than 1.0 miles from a Bay Area Rapid Transit Station and over 10,000 people per square mile population density.
Woodstoves and Fireplaces	Assumed no woodstoves are included in the 2019 project and all the fireplaces are natural gas-based.
Wastewater	Based on the design of the East Bay Municipal Utility District's Wastewater Treatment Plant, emissions estimated from wastewater treatment assumed a process with 100 percent aerobic biodegradation and 100 percent anaerobic digestion with cogeneration.
Water Use	In accordance with the City of Oakland's Green Building Ordinance, the project would implement mandatory measures from the statewide CALGreen Code to reduce indoor water use by approximately 20 percent.

Notes: Default CalEEMod data used for all other parameters not described.
[a] Pacific Gas and Electric Company, 2016. Independent Registry Confirms Record Low Carbon Emissions for PG&E.
Source: Baseline Environmental Consulting, 2019 (Attachment E: Air Quality and Health Risk Screening Analysis; CalEEMod).

In accordance with the City of Oakland's CEQA guidance, the construction CO_2e emissions were annualized over a period of 40 years and then added to the expected CO_2e emissions during operation. The average annual CO_2e emissions per service population (1,064) was determined based on the forecasted population of residents and employees.[36]

As shown in Table 13, the total average annual CO_2e emissions and the total average annual CO_2e emissions per service population for the 2019 project are compared to the City's GHG thresholds of significance. The estimated total CO_2e emissions generated by the 2019 project would be above the City's annual emissions threshold. However, the estimated CO_2e emissions per service population generated by the 2019 project would be below the City's efficiency threshold. The project must exceed both thresholds to be considered a significant impact. Therefore, construction and operation of the 2019 project would have a less-than-significant impact on global climate change. The 2019 project would not substantially increase the severity of significant impacts nor result in new

[36] Based on an average of 2.49 persons per household (2015-2023 Housing Element, 2010 US Census Data, p. 114, Table 3-5) and a standard assumption of 1 employee per 500 square feet.

significant impacts related to the generation of GHG emissions that were not identified in the Arcadia Park EIR.

Consistency with GHG Emissions and Policies (Criteria F.b)

The City's GHG quantitative thresholds were designed to ensure compliance with the State's AB 32 GHG reduction goals, as set forth in the California Air Resources Board's Climate Change Scoping Plan. Since the GHG emissions from the 2019 project would be below the City's Thresholds of Significance (Table 13), it can be assumed that the 2019 project is consistent with the AB 32 Scoping Plan. Moreover, because the 2019 project would be constructed within a Priority Development Area with land uses at a density and intensity that meet or exceed Plan Bay Area recommendations, the 2019 project is not in conflict with Plan Bay Area's GHG reduction targets.

TABLE 13 SUMMARY OF AVERAGE GHG EMISSIONS FOR THE MAXIMUM DEVELOPMENT SCENARIO (POUNDS PER DAY)

Emission Scenario	**CO2e (MT/Year)**	**CO2e (MT/Year/SP)**
Construction[a]	40.1	0.04
Operation – Area	32.5	0.03
Operation – Energy	648.3	0.61
Operation – Mobile	2,597.6	2.44
Operation – Waste	127.3	0.12
Operation – Water	41.7	0.04
Total Project Emissions	3,488	3.3
Thresholds of Significance	1,100	4.6
Exceed Threshold?[b]	**Yes**	**No**

Notes: MT = metric tons; SP = service population
[a] In accordance with CEQA guidance from the City of Oakland, GHG emissions during construction are amortized over 40 years.
[b]Project must exceed both thresholds to be considered a significant impact.
Source: Baseline Environmental Consulting, 2019 (Attachment E: Air Quality and Health Risk Screening Analysis; CalEEMod).

In July 2020, the City adopted the Oakland 2030 Equitable Climate Action Plan (ECAP). The goal of the ECAP is to identify an equitable path toward cost-effectively reducing the City's local climate emissions a minimum of 56 percent below the 2005 level by 2030, transitioning away from fossil fuel dependence, and ensuring that all of the City's communities are resilient to the foreseeable impacts of climate change. The actions and strategies identified by the ECAP were designed to meet five criteria related to the goal: equitable, realistic, ambitious, balanced, and adaptive. The ECAP provides updated actions and strategies to bridge the gaps between the business-as-usual GHG emissions and the City's 2030 and 2050 GHG reduction goals. The ECAP, as a policy roadmap for the City's transition to a low-carbon economy, addresses potential GHG reductions in the following sectors: Transportation and Land Use, Buildings, Material Consumption and Waste, Adaptation, Carbon Removal, City Leadership, and Port of Oakland.

The 2019 project would also be required to comply with the City's Green Building Ordinance and SCAs (described further below), which support the goals, policies, and actions of the ECAP and General Plan. Therefore, the project is consistent with, and would not hinder, the GHG reduction goals set forth in the ECAP and the green planning policies of the General Plan.

The 2019 project is required to determine if a GHG Reduction Plan is required in accordance with the City's SCA-GHG-1, GHG Reduction Plan (#41). The goal of the GHG Reduction Plan is to ensure the project's GHG emissions are at least 36 percent below the project's 2005 business-as-usual baseline GHG emissions and below at least one of the BAAQMD's CEQA thresholds of significance. The GHG Reduction Plan would include a detailed GHG emissions inventory and a comprehensive set of quantified GHG emissions reduction measures.

Table 14 compares the 2019 project to the criteria associated with each of the City's three GHG emissions scenarios under SCA-GHG-1. For a project to be subject to SCA-GHG-1 (and be required to prepare a GHG Reduction Plan), the project must meet all the criteria of one or more of the scenarios. As shown in Table 15, the 2019 project would not trigger the need for a GHG Reduction Plan requirement because none of the three scenarios of SCA-GHG-1 are fully satisfied.

Table 14 Comparison of 2019 Project with Scenarios for SCA-GHG-1

Scenario	Criterion (a)	Criterion (b)	Criterion (c)	Criterion (d)	Applied to Project?
Scenario A	*Involve land use development*	*Exceed BAAQMD's screening criteria*[1]	*Exceed both of the City's applicable thresholds*	--	**No**
	Yes (mixed use)	Yes	No (See Table 13)	--	
Scenario B	*Involve land use development*	*Exceed BAAQMD's screening criteria*[1]	*Exceed one of the City's applicable thresholds*	*Very Large Project*	**No**
	Yes	Yes	Yes (See Table 13)	No	
Scenario C	*Involve a stationary source*	*Exceed the City's applicable threshold*	--	--	**No**
	No	Not applicable	--	--	

Notes: ft^2 = square feet

[1] Based on Table 3-1 of the BAAQMD's 2017 CEQA Air Quality Guidelines[37], a mid-rise apartment building with 87 or less dwelling units, a general condo/townhouse building with 78 or less dwelling units, a general office building with 12,000 or less square feet, or a high-turnover restaurant with 7,000 or less square feet of area would have GHG emission levels below the City's applicable thresholds.

Other SCAs required by the City could also reduce GHG emissions. These include but are not limited to preparation and implementation of a Transportation and Park Demand Management (TDM) Plan under SCA-TRAN-4: Transportation and Parking Demand Management (#77); compliance with green building requirements under SCA-UTIL-8: Green Building Requirements (#85); and Construction and Demolition Waste Reduction and Recycling Plan under SCA-UTIL-5: Construction and Demolition Waste Reduction and Recycling (#81).

Overall, the 2019 project would not conflict with applicable GHG plans, policies, or regulations and this impact would be less than significant. Furthermore, the 2019 project would not substantially increase the severity of significant impacts identified in the Arcadia Park EIR, nor would it result in any significant impacts related to GHG emissions.

Conclusion

Consistent with the findings of the 2010 Housing Element EIR and the 2014 Addendum and the Arcadia Park EIR, implementation of the 2019 project would not result in any new or more severe significant impacts related to GHG emissions or consistency with GHG emissions policies than those identified in the previous EIRs. The SCAs applicable to the project and relevant to reducing GHG emissions, are included in Attachment A: Standard Conditions of Approval and Mitigation Monitoring and Reporting Program.

[37] BAAQMD, 2017. CEQA Air Quality Guidelines, May.

G. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; 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; Create a significant hazard to the public through the storage or use of acutely hazardous materials near sensitive receptors; Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (i.e., the "Cortese List") and, as a result, create a significant hazard to the public or the environment.	■	❒	❒
b. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼-mile of an existing or proposed school.	■	❒	❒
c. 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; or fundamentally impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	■	❒	❒

Previous CEQA Documents Findings

The 1998 LUTE EIR identified potentially significant impacts related exposure of construction workers to hazardous materials and cited one mitigation measure that is functionally equivalent to current SCAs to reduce the potential impacts to less-than-significant levels.

The Arcadia Park EIR identified potentially significant impacts related to underground storage tanks (USTs) that were located on the project site, subsurface contamination, and demolition of structures that could contain lead paint and asbestos. The Arcadia Park EIR cited mitigation measures that are functionally equivalent to current SCAs to reduce the potential impacts to less-than-significant levels.

Project Analysis

Exposure to Hazards, Hazardous Materials Use, Storage and Disposal (Criterion VII.a)

Removal of USTs and remediation of contaminated soil and groundwater has been performed at the project site since the Arcadia Park EIR was prepared. Additionally, the former structures on the project site which may have contained lead paint and asbestos have been demolished since the Arcadia Park EIR was prepared. Construction of the project would involve the use and transport of hazardous materials such as fuels, oils, paints, and adhesives. Handling and transportation of hazardous materials could result in accidental releases and associated health risks to workers, the public, and environment. The 2019 project would be required to comply with SCA-HAZ-1: Hazardous Materials Related to Construction (#42), which requires that Best Management Practices (BMPs) are implemented by the contractor during construction to minimize potential negative effects on groundwater, soils, and human health which could occur as a result of hazardous materials handling and storage. Compliance with SCA-HAZ-1 would minimize the potential for accidental releases of hazardous materials used during construction and ensure that potential impacts of the 2019 project associated with routine transport, use, or disposal of hazardous materials would be less than significant.

Only small quantities of commercially available hazardous materials such as paints and cleaning products would be used for routine maintenance during operation of the 2019 project. Therefore, potential impacts related to the routine transport, use, or disposal of hazardous materials during operation of the project would be less than significant. Acutely hazardous materials would not be used or stored during construction or operation of the 2019 project.

The project site has been the subject of environmental investigations and cleanup actions due to past releases of hazardous materials that impacted soil and groundwater, including releases from fuel underground storage tanks (USTs). The project site is listed as a leaking UST (LUST) site on the State Water Board's Geotracker database,[38] and therefore is included on a list of hazardous materials release sites compiled pursuant to Government Code Section 65962.5. The southern portion of the project site was historically occupied

[38] State Water Board, 2018. Geotracker web page for Former Fleischmann's Yeast, 921 98th Avenue, Oakland, CA, 94603. Available online at: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0600136714, Accessed September 18, 2018.

by a yeast manufacturing plant, a vinegar processing plant, a maintenance shop, a deep well pump house, a boiler house and engine room, a waste storage area, a railroad spur, and an asphalt-covered parking lot. Margarine processing was also reportedly conducted at the property until 1990. Upon closure of the yeast manufacturing processes at an unknown date, the plant was used for storage and distribution of Fleischmann's Yeast products from other facilities. Chemicals reported to be used at the project site included aqueous ammonia, phosphoric acid, sodium hypochlorite, and sulfuric acid, which were stored in aboveground storage tanks (ASTs), and oils and waste oils, which were stored in 55-gallon drums. Features or equipment that may have contained, used, or produced hazardous materials or wastes at the project site included cooling towers, separators, floor drains, electrical transformers, and diesel generators.[39]

The USTs removed from the project site include two 25,000-gallon diesel USTs removed from the central portion of the project site in 1990, two 1,000-gallon gasoline USTs removed from the southern portion of the project site at an unknown date, and a 14,000-gallon formaldehyde UST removed from the southern portion of the project site in 2004. Environmental investigation activities were conducted at the project site between 2004 and 2008, and remediation activities were conducted in 2007. Remediation of the project site consisted of excavation and off-site disposal of contaminated soil that exceeded residential environmental screening levels. The northern portion of the project site was excavated to depths of three to five feet below ground surface to remove lead and petroleum hydrocarbon-impacted soil. Three large excavations were conducted at the locations of the former USTs to remove petroleum and polynuclear aromatic hydrocarbon (PAHs)-impacted soil. Additionally, six smaller excavations were completed to remove soil contaminated by petroleum hydrocarbons, metals, and/or PAHs. Approximately 30,775 cubic yards of contaminated soil were removed from the project site. In addition, approximately 1,355,000 gallons of groundwater were pumped out of the excavations and discharged to the sanitary sewer under a permit. An industrial water supply well was also properly destroyed in May 2007.[40]

To mitigate potential human health risks associated with residual groundwater contamination, a deed restriction was recorded for the project site which (1) prohibits the installation of water wells, (2) requires the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) be notified if the project site is to be developed for sensitive uses (e.g., housing, schools, medical facilities), and (3) requires that a vapor barrier be installed beneath future buildings constructed in the areas of the former USTs.[41]

[39] Geomatric, 2014. Phase I Environmental Site Assessment, Arcadia Park Development, Oakland, California, July 6.

[40] San Francisco Bay Regional Water Quality Control Board, 2014. No Further Action at Arcadia Park Development Areas D and E (Former Fleischmann's Yeast), 921 98th Avenue, Oakland, Alameda County, March 27.

[41] San Francisco Bay Regional Water Quality Control Board, 2013. Covenant and Environmental Restriction on Property, Arcadia Park Development, 921 98th Avenue, Oakland, California, Recorded June 4.

In March 2014, the Regional Water Board issued a “No Further Action” letter for the project site which confirmed the completion of investigation and remedial action, and indicated that based on available data, the remnant contamination present beneath the project site does not appear to pose a significant risk to human health and the environment, and is expected to naturally attenuate with time. [42]

The remediation of soil and groundwater and obtaining case closure for the project site (including the LUST cases) under Regional Water Board oversight, and proper destruction of the industrial water supply well, satisfied the requirements of Mitigation Measures HAZ-1.1[43] and HAZ 1.4[44] of the Arcadia Park EIR.

Although the project site has been investigated and remediated, there is the potential for previously unidentified contamination or subsurface features of environmental concern (e.g., USTs, pipelines, sumps) to be identified during construction. Mitigation Measure M.5 of the LUTE EIR and Mitigation Measure HAZ 1.1 of the Arcadia Park EIR required the preparation and implementation of a site-specific health and safety plan (HSP) to protect construction workers. Mitigation Measure HAZ 1.1 of the Arcadia Park EIR additionally required that the HSP provide procedures to be undertaken if previously unreported contamination is discovered and establish procedures for the safe storage and use of hazardous materials. The 2019 project would be required to comply with SCA-HAZ-1: Hazardous Materials Related to Construction (#43), which is functionally equivalent to Mitigation Measure M.5 of the LUTE EIR and Mitigation Measure HAZ 1.1 of the Arcadia Park EIR.

The 2019 project would also be required to comply with SCA-HAZ-2: Hazardous Building Materials and Site Contamination (#43), which requires the project applicant to implement remedial recommendations and submit to the City evidence of approval for any proposed remedial action and required clearances by the applicable local, State, or federal regulatory agency. In accordance with the requirements of SCA-HAZ-2 and the deed restriction for the project site, the project applicant must inform the Regional Water Board of the project, install vapor barriers beneath structures in the areas of the former USTs, and provide the City with evidence of approval from the Regional Water Board for the proposed residential use of the project site.

Compliance with the requirements of SCA-HAZ-1, SCA-HAZ-2, and the deed restriction for the project site would ensure that the project would result in less-than-significant impacts associated with past accidental releases of hazardous materials to the subsurface of the project site.

[42] Ibid.
[43] Also referred to as Mitigation Measure HAZ 1a
[44] Also referred to as Mitigation Measure HAZ 1d

Hazardous Materials within a Quarter-Mile of a School (Criterion VII.b)

There are no schools located within a quarter mile of the project site.[45] Therefore, the 2019 project would have no impacts associated with emitting hazardous emissions or handling hazardous materials within a quarter mile of a school.

Emergency Access Routes (Criterion VII.c)

The 2019 project would extend existing streets across the project site, including Blake Drive, Tubman Drive, and Garner Drive. These alterations to the roadway network would not result in less than two emergency access routes for a roadway exceeding 600 feet in length. The Safety Element of the City of Oakland General Plan[46] indicates that the emergency evacuation routes in the vicinity of the project site include San Leandro Street and 98th Avenue. Construction of the 2019 project could temporarily impact 98th Avenue; however, the 2019 project would not permanently alter these designated evacuation routes, and compliance with traffic control requirements imposed by the City for the permitting of temporary closure of street areas would ensure that appropriate emergency access is maintained at all times during construction activities. In addition, SCA-HAZ:3 Fire Safety Phasing Plan (#45) would ensure that the 2019 project includes all fire safety features incorporated into phases of the project. Therefore, the 2019 project would have a less-than-significant impact related to emergency access and evacuation.

Conclusion

Consistent with the findings of the LUTE EIR and the Arcadia Park EIR, the 2918 project would not result in any significant impacts related to hazards and hazardous materials. Further, based on an examination of the analysis and the findings and conclusions of the LUTE EIR and Arcadia Park EIR, implementation of the 2019 project would not substantially increase the severity of potentially significant impacts identified in the Arcadia Park EIR, nor would it result in new significant impacts related to hazards and hazardous materials that were not identified in the LUTE EIR or Arcadia Park EIR.

With implementation of the City's SCAs, the 2019 project would not result in any significant project or cumulative impacts related to hazards and hazardous materials. No mitigation measures are required. Compliance with the City's SCAs, including SCA-HAZ-1: Hazardous Materials Related to Construction (#42) and SCA-HAZ-2: Hazardous Building Materials and Site Contamination (#43), and the deed restriction, as discussed above, would ensure that the 2019 project would not result in significant impacts related to

[45] California Department of Education, 2018. California Schools Directory. Available online at: https://www.cde.ca.gov/schooldirectory/, Accessed September 18.

[46] City of Oakland, 2004. General Plan, Safety Element, Figure 7.2. Amended 2012. http://www2.oaklandnet.com/government/o/PBN/OurServices/GeneralPlan/DOWD009020, accessed November 18.

hazards and hazardous materials. These SCAs are included in Attachment A: Standard Conditions of Approval and Mitigation Monitoring and Reporting Program.

H. HYDROLOGY AND WATER QUALITY

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Violate any water quality standards or waste discharge requirements; result in substantial erosion or siltation on- or off-site that would affect the quality of receiving waters; create or contribute substantial runoff that would be an additional source of polluted runoff; otherwise substantially degrade water quality; or fundamentally conflict with the City of Oakland Creek Protection Ordinance (Oakland Municipal Code Chapter 13.16) intended to protect hydrologic resources.	■	❐	❐
b. 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 preexisting nearby wells would drop to a level that would not support existing land uses or proposed uses for which permits have been granted).	■	❐	❐
c. Create or contribute substantial runoff that would exceed the capacity of existing or planned stormwater drainage systems; or substantially alter the existing drainage pattern of the site or area, including through the alteration of the course, or increase the rate or amount of flow of a creek, river, or stream in a manner that would result in substantial erosion, siltation, or flooding, either on or off-site.	■	❐	❐
d. Result in substantial flooding on- or off-site; 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; place within a 100-year flood hazard area structures that would impede or redirect flood flows; or expose people or structures to a substantial risk of loss, injury, or death involving flooding.	■	❐	❐

Previous CEQA Documents Findings

Hydrology and water quality were analyzed in the Program EIRs. The 2010 Housing Element EIR and 2014 Addendum found that all impacts related to hydrology and water quality would be less than significant and no mitigation measures would be required. The 1998 LUTE EIR found all potential hydrology and water quality impacts to be less than significant and therefore no mitigation measures or SCAs were required.

The Initial Study prepared in association with the Arcadia Park EIR indicated that the project area's storm drain system was over capacity, and the existing storm drain at 92nd Avenue would be upsized as required by Mitigation Measure VIII.1. However, Mitigation Measure VIII.1 was mistakenly missing from the Arcadia Park Initial Study.

Project Analysis

Water Quality and Creeks (Criterion VIII.a)

The 2019 project is located within a highly urbanized environment and there are no lakes, creeks, or other surface waters in the immediate proximity of the project site. The project site is in the Elmhurst Creek Watershed and stormwater runoff from the project site is conveyed to the engineered channel of Elmhurst Creek, located approximately 4,000 feet northwest of the project site, via the City's underground storm drains.[47]

Construction of the 2019 project would involve grading and construction, which could result in degradation of the quality of stormwater runoff, erosion and/or sedimentation, and adverse effects on downstream receiving waters. Additionally, potential discharge of contaminated dewatering effluent during construction could result in impacts to the environment from the discharge of sediment and contaminants to receiving waters. As discussed above in *Section G, Hazards and Hazardous Materials*, the project would be required to comply with SCA-HAZ-1: Hazardous Materials Related to Construction (#42) and SCA-HAZ-2: Hazardous Building Materials and Site Contamination (#43) which require BMPs to be implemented during construction to minimize potential negative effects on groundwater and receiving waters which could result from inappropriate handling of construction-related hazardous materials (e.g., fuels, oils, and paints) and contaminated soil and groundwater during construction.

Groundwater dewatering would be subject to permits from East Bay Municipal Utility District (EBMUD) or the Regional Water Quality Control Board, depending if the discharge were flowing to the sanitary or storm sewer system. If the water is not suitable for discharge to the storm drain (receiving water), dewatering effluent may be discharged to EBMUD's sanitary sewer system if special discharge criteria are met. These include, but are

[47] Fugro Consultants Inc., 2014. Elmhurst Creek Watershed, Available online at: https://www.acfloodcontrol.org/files/watersheds/maps/pdfs/elmhurst_creek.pdf, Accessed September 19.

not limited to, application of treatment technologies or BMPs which would result in achieving compliance with the wastewater discharge limits. Discharges to EBMUD's facilities must occur under a Special Discharge Permit. EBMUD operates its wastewater treatment facilities in accordance with Waste Discharge Requirements issued by the Regional Water Board, which require rigorous monitoring of effluent to ensure discharges do not adversely impact receiving water quality.

The 2019 project would require a grading permit and therefore would be required to comply with SCA-HYD-1: Erosion and Sedimentation Control Plan for Construction (#48), which requires preparation and implementation of an Erosion and Sedimentation Control Plan to manage stormwater runoff and minimize erosion and sedimentation through measures such as barriers and devices to trap, store, and filter runoff. The 2019 project would also be required to comply with the Construction General Permit (State Water Board Order 2009-0009-DW),[48] including preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), as required by SCA-HYD-2: State Construction General Permit (#49). A SWPPP is required to identify all potential pollutants and their sources, including erosion and exposure of construction materials to runoff, and must include a list of BMPs to reduce the discharge of construction-related stormwater pollutants. A SWPPP must include a detailed description of controls to reduce pollutants and outline maintenance and inspection procedures. Typical sediment and erosion BMPs include protecting storm drain inlets and establishing and maintaining construction exits and perimeter controls to avoid tracking sediment off-site onto adjacent roadways. A SWPPP also defines proper building material staging and storage areas; paint and concrete washout areas; proper equipment/vehicle fueling and maintenance practices; measures to control equipment/vehicle washing; allowable non-stormwater discharges; and includes a spill prevention and response plan.

Because the 2019 project would create over 10,000 square feet of new impervious surfaces, the project would be required to comply with Provision C.3 of the National Pollutant Discharge Elimination System (NPDES) Municipal Regional Permit (MRP).[49] Provision C.3 of the MRP requires implementation of low impact development (LID) source control, site design, and stormwater treatment. LID employs principles such as preserving and recreating natural landscape features and minimizing impervious surfaces to create functional and appealing site drainage that treats stormwater as a resource, rather than a waste product. Practices used to adhere to these LID principles include measures such as rain barrels and cisterns, green roofs, permeable pavement, preserving undeveloped open space, and biotreatment through rain gardens, bioretention units, bioswales, and

[48] State Water Resources Control Board Division of Water Quality, 2009. Construction General Permit Fact Sheet. 2009-0009-DWQ amended by 2010-0014-DWQ & 2012-0006-DWQ

[49] San Francisco Bay Regional Water Quality Control Board (RWQCB), 2015. San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, Order No. R2-2015-0049, NPDES Permit No. CAS612008, November 19.

planter/tree boxes. The 2019 project is exempt from hydromodification[50] requirements of Provision C.3 of the MRP because it drains through enclosed pipes until it reaches the tidally influenced engineered channel of Elmhurst Creek.[51]

The 2019 project would be required to comply with SCA-HYD-3: NPDES C.3 Stormwater Requirements for Regulated Projects (#53), which requires compliance with provision C.3 of the MRP, and the preparation and implementation of a Post-Construction Stormwater Management Plan, which would include and identify stormwater control and treatment systems. Compliance with SCA-HYD-3 also requires the 2019 project applicant to enter into a maintenance agreement with the City, to ensure adequate installation/construction, operation, maintenance, inspection, and reporting of any on-site stormwater treatment measures.

Compliance with SCA-HAZ-1, SCA-HAZ-2, SCA-HYD-1, SCA-HYD-2, and SCA-HYD-3 would ensure that the 2019 project would result in less-than-significant impacts to water quality.

Use of Groundwater (Criterion VIII.b)

During construction, temporary dewatering could be necessary for excavation activities. Construction-related dewatering would be temporary and limited to the area of excavations on the project site and would not substantially contribute to depletion of groundwater supplies. Operation of the 2019 project would not involve dewatering. The project would not use groundwater as potable water would be supplied to the project by EBMUD.

Most of the project site is currently covered by pervious (unpaved) surfaces. The 2019 project would result in an increase in impervious surfaces on the project site compared to the existing condition. Although the 2019 project would increase the area of impervious surfaces, the construction of stormwater management LID features would allow much of the stormwater runoff from impervious surfaces of the project site to infiltrate into the ground, therefore the 2019 project would have a less-than-significant impact on groundwater resources.

Stormwater Drainage and Drainage Patterns (Criterion VIII.c)

Under existing conditions, most of the project site is covered with pervious surfaces (e.g., vegetation, soil, gravel, concrete rubble, and crushed asphalt). Existing impervious

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[50] Hydromodification is defined as the modification of a stream's hydrograph, caused in general by increases in flows and durations that result when land is developed (e.g., made more impervious). The effects of hydromodification include, but are not limited to, increased bed and bank erosion, loss of habitat, increased sediment transport and deposition, and increased flooding.

[51] San Francisco Bay Regional Water Quality Control Board (RWQCB), 2015. San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, Order No. R2-2015-0049, NPDES Permit No. CAS612008, November 19.

surfaces include remnants of concrete slabs/pavement in the southwest portion of the site, and street/sidewalk areas in the southeast portion of the project site. The project would increase the amount of impervious surface through construction of new structures, driveways, streets, and sidewalks. The construction of stormwater management LID features would allow much of the stormwater runoff from new impervious surfaces to infiltrate the ground, which would reduce the amount of runoff from the new impervious surfaces that would be discharged to the City's storm drain system. Because the project site is exempt from hydromodification requirements, as discussed above, the post-project stormwater runoff is not required to match the pre-project condition. As discussed above, the Arcadia Park EIR indicated that the project area's storm drain system was over capacity, and the existing storm drain in 92nd Avenue would be upsized. The former 15-inch diameter storm drain in 92nd Avenue was upsized to a 36-inch diameter storm drain during the construction of the northern and eastern portions of the Arcadia Park project.[52, 53]

The 2019 project would be required to comply with SCA-HYD-3: NPDES C.3 Stormwater Requirements for Regulated Projects (#54), which requires preparation and implementation of a Post-Construction Stormwater Management Plan that must include and identify the location and size of new and replaced impervious surface; directional surface flow of stormwater runoff; location of proposed on-site storm drain lines; site design measures to reduce the amount of impervious surface area; source control measures to limit stormwater pollution; and stormwater treatment measures to remove pollutants from stormwater runoff, including the method used to hydraulically size the treatment measures. Compliance with SCA-HYD-3 and the City's review of the Post-Construction Stormwater Management Plan would ensure that appropriate stormwater controls are incorporated into the project design to ensure that changes in drainage patterns and stormwater runoff from the project would have less-than-significant impacts related to exceeding the capacity of existing storm drain systems, erosion, siltation, or flooding.

Flooding and Substantial Risks from Flooding (Criterion VIII.d)

Current floodplain mapping prepared by the Federal Emergency Management Agency (FEMA) indicates that the project site is located outside the 100-year flood hazard area.[54] Therefore, development of the 2019 project would not be subject to significant impacts with respect to storm-related flooding.

[52] Dara O'Byrne, 2019. E-mail from Dara O'Byrne of the City of Oakland to Emilie Wolfson of Urban Planning Partners, September 30.

[53] Civil Engineering Associates. 2007. As-Built Utility Plans, 92nd Avenue, April 20, updated September 5.

[54] Federal Emergency Management Agency, 2009. Flood Insurance Rate Map, Map Number 06001C0256G, August 3.

Conclusion

With implementation of the City's SCAs, the 2019 project would not result in any significant project or cumulative impacts related to hydrology and water quality. No mitigation measures are required. Compliance with the City's SCAs, including SCA-HAZ-1: Hazardous Materials Related to Construction (#42), SCA-HAZ-2: Hazardous Building Materials and Site Contamination (#43), SCA-HYD-1: Erosion and Sedimentation Control Plan for Construction (#48), SCA-HYD-2: State Construction General Permit (#49), and SCA-HYD-3: NPDES C.3 Stormwater Requirements for Regulated Projects (#53), as discussed above, would ensure that the 2019 project would not result in significant impacts related to hydrology and water quality.

I. LAND USE, PLANS, AND POLICIES

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Physically divide an established community.	■	❐	❐
b. Result in a fundamental conflict between adjacent or nearby land uses.	■	❐	❐
c. 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 actually result in a physical change in the environment.	■	❐	❐

Previous CEQA Documents Findings

Land use, plans, and policies were evaluated in the Program EIRs. The 2010 Housing Element EIR and 2014 Addendum found all potential land use or policy impacts to be less-than-significant and therefore no mitigation measures or SCAs were required.

The 1998 LUTE EIR cited a significant and unavoidable impact associated with policy inconsistences with the City's Clean Air Plan, resulting from significant and unavoidable increases in criteria pollutants from increased automobile traffic regionally. It identified mitigation measures, which largely align with current City of Oakland SCAs involving Transportation Demand Management (TDM) and apply to all projects within the City of Oakland.

The Arcadia Park EIR evaluated potential impacts to land use, plans, and policies, and concluded that impacts related to land use and policy would be less than significant and no mitigation measures would be needed.

Project Analysis

Division of Existing Community, Conflict with Land Uses, or Land Use Plans (Criteria 9a through 9c)

Consistent with the findings of the Arcadia Park EIR, the implementation of the 2019 project would not physically divide an established community. The 2019 project would be incorporated into the existing street network and would not create any physical barriers that would impede access nor would any existing access be permanently removed. In addition, the development of the site would better connect existing residential neighborhoods through street improvements.

The project site is in the Elmhurst neighborhood along the San Leandro Street corridor, which is an area with mixed industrial, residential, and commercial uses. The 2019 project, which would develop the southwestern corner of the site analyzed by the Arcadia Park EIR, is surrounded on three sides by light-industrial uses, and on its fourth side by residential uses. Consistent with the Arcadia Park EIR, the 2019 project would not result in a fundamental conflict between adjacent or nearby land uses. Because the project site is on the corner of two corridors (98th Avenue and San Leandro Street), existing industrial uses to the west and south are set back across the width of the existing streets and would not be located directly adjacent to the residences on the project site.

The project site is currently two parcels of sparsely vegetated vacant lots with piles of construction materials strewn about the site, surrounded by wood slat, chain-link, and concrete fences. The development of the site with a mixture of townhomes and multi-family uses would be consistent with the established neighborhood to the east and north. The existing residential properties along the eastern border of the site on Dunbar Drive and Ellington Way would be particularly enhanced by the continuity of residential uses provided by the 2019 project.

The City of Oakland General Plan land use classification for the site, as established by the LUTE, is Housing and Business Mix.[55] The Housing and Business Mix classification recognizes the equal importance of both housing and business, and is intended to guide a transition from heavy industry to low impact light industrial and other businesses that can co-exist compatibly with residential development. The 2019 project is consistent with the General Plan land use designation because it would transition a former industrial site to a mixture of residential uses and compatible commercial uses, approximately 11,688 square feet split between 9 work/live dwelling units as well as 2,468 square feet of commercial/retail space. The General Plan allows a maximum residential density of 30 principal units per gross acre; however the density and nonresidential floor area ratio is determined by the underlying zoning designation.

The existing HBX-1 zoning of the site allows for residential and commercial uses. The HBX-1 zoning designation allows for residential uses at a maximum density of 1,000 square feet of lot area per residential unit a maximum of 1.75 nonresidential Floor Area Ratio, and a maximum of 1.75 structure floor area ratio. When calculated together, 399 residential units are allowed by the zoning. With a PUD approval the project is allowed a 25 percent increase up to General Plan maximum of 423 units.

[55] City of Oakland, March 1998. General Plan, Land Use and Transportation Element.

The PUD permitting process allows projects to waive or modify certain zoning standards, such as use, density, and height, in exchange for adherence to a comprehensive development plan, dedication of open space, and construction of key infrastructure.

Although the maximum height allowed in the HBX-1 zone is usually 35 feet, the 2019 project's maximum height of 60 feet is still within compliance of the HBX-1 zoning regulations because it is adjacent to the BART right-of-way. Section 17.65.100.3 (B) of the City of Oakland's Planning Code states that structures located on lots immediately adjacent to above-ground BART rights-of-way and within the closest 125 feet of the BART right-of-way are eligible for a 75-foot height limit. Parcels A, B, and C, which, as proposed, all exceed the 35-foot height limit in the HBX-1 zone, are located within 125 feet of the BART right-of-way and are thus eligible for the 75-foot height limit. Although Parcel D exceeds the 35-foot height limit and is over 125 feet from the BART right-of-way, height limits may be waived or modified as part of the PUD permitting process.[56]

Conclusion

Consistent with the findings of the Arcadia Park EIR, the 2019 project would not result in any significant impacts related to land use or planning policies. Although the project's land uses are different than what was considered in the Arcadia Park EIR, the prior CEQA analysis can be relied upon since the 2019 project revisions or changes under which the project would be undertaken or new information would not result in any new land use impacts. Further, based on an examination of the analysis, findings, and conclusions of the Arcadia Park EIR and Program EIRs, implementation of the 2019 project would not substantially increase the severity of impacts identified in the previous EIRs. The Arcadia Park EIR did not identify any mitigation measures related to land use, plans, or policies, and no City SCAs regarding land use, plans, or policies have been identified for the implementation of the 2019 project.

[56] Oakland Planning Code 17.142.100(G)

J. NOISE

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. 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 (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); or generate noise in violation of the City of Oakland nuisance standards (Oakland Municipal Code Section 8.18.020) regarding persistent construction-related noise.	■	❒	❒
b. Generate noise in violation of the City of Oakland Noise Ordinance (Oakland Planning Code Section 17.120.050) regarding operational noise.	■	❒	❒
c. Generate noise resulting in a permanent increase in ambient noise levels in the project vicinity above levels of 5 A-weighted decibels (dBA) existing without the project; or under a cumulative scenario, 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).	■	❒	❒

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
d. Expose persons to interior day/night noise level (L_{dn}) or community noise equivalent level (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); expose the project to community noise in conflict with the land use compatibility guidelines of the Oakland General Plan after incorporation of all applicable SCAs; or 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]).	■	❐	❐
e. 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).	■	❐	❐

Previous CEQA Documents Findings

Noise was analyzed in the Program EIRs. The 2010 Housing Element EIR and 2014 Addendum found impacts to be less than significant and no mitigation measures were required. The 1998 LUTE EIR identified significant and unavoidable impacts related to construction noise and vibration and cited applicable mitigation measures.

The Arcadia Park EIR identified potentially significant impacts related to compatibility of the project site for the intended residential use and violation of the City of Oakland Noise Ordinance regarding construction noise. The Arcadia Park EIR also cited mitigation measures that are functionally equivalent to current SCAs to reduce the potential noise impacts to less-than-significant levels. The Arcadia Park EIR also identified a potentially significant impact related to exposure of future occupants of the project to perceptible vibration from BART trains and Union Pacific trains. Based on recent case law, CEQA does not require the analysis of the impacts from the existing environmental conditions on a project's future users or residents (unless the project exacerbates the existing conditions). However, for informational purposes, findings in the Arcadia Park EIR are summarized in the analysis below regarding potential exposure of future occupants of the project site to perceptible vibration.

The following two potential noise and vibration impacts were not discussed in the Arcadia Part EIR and are evaluated in more detail in this analysis: (1) potential construction-generated vibration; and (2) potential cumulative traffic noise increase. The analysis below demonstrates that the 2019 project would not result in new significant impacts related to potential construction-generated vibration or potential cumulative traffic noise increase.

Project Analysis

Construction Noise (Criterion J.a)

An acoustical analysis was performed as part of this CEQA review process to evaluate potential noise impacts during project construction. The findings of the acoustical analysis for project construction are summarized below.

Construction is anticipated to commence in three phases. Phase 1 is expected to begin in 2021. The timing for Phase 2 and Phase 3 has not yet been determined. Construction would temporarily increase noise levels in the vicinity of the project site. Pile-driving, which can generate extreme levels of noise, is not proposed as part of the 2019 project.[57] Construction noise levels would vary from day to day, depending on the quantity and condition of the equipment being used, the types and duration of activity being performed, the distance between the noise source and the receptor, and the presence or absence of barriers, if any, between the noise source and receptor. Demolition, excavation/grading, and foundation work are typically the noisiest phases of construction and would occur early in the development process. The later phases of construction include activities that are typically quieter and that occur within the building under construction, thereby providing a barrier for noise between the construction activity and any nearby receptors.

The project includes four phasing scenarios, all of which would include three phases of construction. There would be occupants of earlier phases during the construction of later phases. Therefore, there would be both on-site and off-site receptors for all four scenarios. The nearest off-site sensitive receptors to the project site are existing residences located approximately 40 feet from the northeastern boundary of the project site across Dunbar Drive, and approximately 40 feet from the northeastern boundary of the project site across Ellington Way. It is assumed that on-site receptors would be separated from the later phases of construction by the internal roadways on the project site, which is about 40 feet. For example, for Scenario A, during construction of Phase 1

[57] Han, Claire, Director of Development for Madison Park, 2018. Email communication with Emilie Wolfson of Urban Planning Partners, Inc., December 6.

of the 2019 project, the nearest sensitive receptors[58] to the project site are existing residences located approximately 40 feet from the northeastern boundary of the project site across Dunbar Drive. During construction of Phase 2 of the project, in addition to existing residences across Dunbar Drive, future residences in Parcel A (part of the proposed Phase 1 project development) would also be located approximately 40 feet from other parcels where the second phase of construction would occur. During construction of Phase 3 of the project, the nearest sensitive receptors to the project site are existing residences located approximately 40 feet from the northeastern boundary of the project site across Ellington Way. In addition, future residences in Parcel A (part of the proposed Phase 1 project development), Parcel E, and Parcel F (part of the proposed Phase 2 project development) would also be located approximately 40 feet from other parcels where the third phase of construction would occur. Other surrounding receptors to the project site include existing industrial land uses located 70 feet to southeast, 180 feet to the west, and 600 feet to the northwest.

Table 15 shows typical noise levels associated with various types of construction equipment that may be used during construction. To evaluate potential construction noise associated with the 2019 project, this analysis quantified the noise that would result from the simultaneous operation of the two noisiest pieces of equipment expected to be used during construction (this is a standard, yet conservative, analytical approach used in acoustical analysis to estimate maximum construction noise associated with proposed projects). The addition of the two noisiest pieces of equipment are presented in Table 16 to characterize the noise impact from the 2019 project at the nearest receptors.

TABLE 15 REFERENCE NOISE LEVELS FROM CONSTRUCTION EQUIPMENT, DBA

Equipment	Reference Noise Level at 50 Feet (dBA)
Excavator	85
Scrapers	85
Concrete/Industrial Saw	76
Rubber Tired Dozer	85
Tractor/Loader/Backhoe	80
Grader	85
Crane	85
Generator Sets	82
Welder	73
Paver	85
Roller	85
Air Compressor	80

[58] Legal residences, schools, childcare facilities, health care or nursing home, public open space, or similarly sensitive land uses. (Refer to City of Oakland CEQA thresholds of significance guidelines.)

Notes: The types of construction equipment are based on the California Emissions Estimator Model (CalEEMod) equipment list (see Air Quality Section and Attachment E: Air Quality and Health Risk Screening Analysis; CalEEMod).
Source: U.S. Department of Transportation (U.S. DOT), 2006. FHWA Highway Construction Noise Handbook.

TABLE 16 CALCULATED NOISE LEVELS FROM CONSTRUCTION EQUIPMENT, DBA

	Calculated Noise Level for the Two Noisiest Pieces of Equipment[1]			
	At 40 Feet (existing residences across Dunbar Drive, existing residences across Ellington Way, and future residences in Parcel A, Parcel E, and Parcel F)	**At 70 Feet (industrial land uses to the southeast)**	**At 180 Feet (industrial land uses to the west)**	**At 600 Feet (industrial land uses to the northwest)**
	90	85	77	66
Construction Noise Standards	Weekday hours (7:00 a.m. to 7:00 p.m.):65 dBA for residential areas and 70 dBA for commercial and industrial areas			
Exceed Standards?	**Yes**	**Yes**	**Yes**	**No**

1. The two noisiest pieces of equipment could be two any of these pieces of equipment: an excavator, a scraper, a rubber-tired dozer, a grader, a crane, a paver, or a roller, which would generate noise levels of 85 dBA at 50 feet.

As indicated in Table 16, the two noisiest pieces of equipment would be expected to exceed applicable noise thresholds for multiple receptors.

It should be noted that a typical building façade with windows closed reduces noise by 25 dBA.[59] Therefore, interior noise levels at nearby receptors would be substantially lower than exterior noise levels. Also, it should be noted that the use of heavy construction equipment would occur at different locations across the site. Therefore, the duration and frequency that heavy construction equipment would operate in proximity to any particular receptor would be limited on any given day and would not be expected to last more than a few hours or days at a time. In addition, once the external structure has been erected, the noisiest phases of construction would be complete and noise from heavy construction equipment inside of the structure would be attenuated by the structure itself.

The City adopted SCAs since certification of the Arcadia Park EIR that are functional equivalents to, or more protective of nearby receptors, than the mitigation measures from the Arcadia Park EIR. Although construction-generated noise could temporarily result in the exposure of the existing and future receptors to noise levels in excess of the Noise Ordinance Standards, the implementation of applicable SCAs would lessen the impacts of

[59] Charles M. Salter Associates Inc., 1998. Acoustics – Architecture, Engineering, the Environment.

construction period noise. The relevancy of each of these SCAs to the 2019 project and the Arcadia Park EIR mitigation measures is described below.

- SCA-NOI-1: Construction Days/Hours (#61). This SCA provides limits on the days and hours of standard construction activities to avoid generating noise when it would be most objectionable to receptors. These limitations, which specify that construction activities would be limited to between 7:00 a.m. and 7:00 p.m. Monday through Friday (among other restrictions), would prevent the disturbance of sleep for a majority of residents located close to the project site. This SCA also requires any extension of these work hours to be approved in advance by the City and requires property owners and occupants within 300 feet of the project site to be notified of such an extension. Implementation of this SCA would fulfill the requirements of Mitigation Measure Noise-2.1 from the Arcadia Park EIR.
- SCA-NOI-2: Construction Noise (#62). This SCA requires all construction projects to implement basic noise reduction measures during construction, which would fulfill the requirements of Mitigation Measure Noise-2.2 from the Arcadia Park EIR.
- SCA-NOI-3: Extreme Construction Noise (#64). Since construction of the project could generate noise levels as high as 90 dBA at both existing and future residences, and exceeding the long-term construction noise standard, the 2019 project would be required to comply with SCA-NOI-3. SCA-NOI-3 requires that the project applicant prepare and implement a Construction Noise Management Plan that contains site-specific noise attenuation measures to reduce construction impacts associated with extreme noise generating activities. The types of measures that would effectively reduce construction noise to less-than-significant levels that may be included in the Construction Noise Management Plan include the following (the preparer of the Construction Noise Management Plan would have the flexibility to apply the appropriate measures to achieve applicable thresholds):
  - Temporary noise barriers placed between the proposed construction activities and sensitive receptors. The noise barriers may be constructed from plywood and installed on top of a portable concrete K-Rail system in order to move and/or adjust the wall location during construction activities. A sound blanket system hung on scaffolding, or other noise reduction materials that result in an equivalent or greater noise reduction than plywood, may also be used. The composition, location, height, and width of the barriers during different phases of construction would be determined by a qualified acoustical consultant and incorporated into the Construction Noise Management Plan for the 2019 project.
  - Best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) may be used for project equipment and trucks during construction wherever feasible. For example, exhaust mufflers on pneumatic tools can lower noise levels by up to about 10 dBA and external jackets can lower noise levels by up to about 5 dBA.

- Noise control blankets may be utilized on the building structure as the building is erected to reduce noise emission from the site. The use of noise control blankets would be particularly effective if they are targeted to cover the levels of the building that have line of sight with the windows of nearby receptors;
- Construction equipment should be positioned as far away from noise-sensitive receptors as possible. The project site is surrounded by hard surfaces, and therefore, for every doubling of the distance between a given receptor and construction equipment, noise will be reduced by approximately 6 dBA.

The incorporation of the appropriate noise attenuation measures into the Construction Noise Management Plan required by SCA-NOI-3: Extreme Construction Noise (#63) would substantially reduce the impact of construction generated noise on existing and future receptors. Implementation of SCA-NOI-3 would fulfill the requirements of Mitigation Measure Noise-2.3 from the Arcadia Park EIR.

- SCA-NOI-4: Construction Noise Complaints (#65) provides additional measures to respond to and track noise complaints during construction to allow sources of potentially disruptive construction noise to be quickly controlled or eliminated. Implementation of this SCA would fulfill the requirements of Mitigation Measure Noise-2.4 from the Arcadia Park EIR.

Implementation of the City of Oakland’s SCAs, which are functionally equivalent to mitigation measures in the Arcadia Park EIR, would reduce the impacts of noise generated by construction on receptors in the vicinity of the project site to a less-than-significant level.

Operational Noise (Criterion J.b)

As consistent with the Arcadia Park EIR, the intended residential use of the project site would not normally result in any activities that would generate operational noise. Therefore, it is not anticipated that the project would generate noise in violation of the City of Oakland Noise Ordinance (Oakland Planning Code Section 17.120.050) regarding operational noise and the impact would be less than significant.

Permanent Increase in Ambient Traffic Noise and Cumulative Noise Impact (Criterion J.c)

Implementation of the project would result in increased traffic on local area roadways. As indicated in Criterion J.c, a project is considered to generate a significant increase in ambient traffic noise if it results in a 5-dBA permanent increase in noise levels in the project vicinity.

Based on the roadway noise contours and the railroad/BART noise contours in the City of Oakland General Plan, combined noise levels (both roadways and railroad/BART) range from 66 to 71 dBA L_{dn} at the project site and its vicinity.[60,61] Generally, during the peak traffic hour under normal traffic conditions, Ldn is within plus or minus 2 dBA of the Leq.[62] Therefore, the existing AM and PM peak hour traffic noise levels in the project vicinity range from approximately 64 to 73 dBA L_{eq}.

The assessment of AM and PM peak hour traffic volumes at three intersections near the project site indicates that the highest project-generated traffic volumes would occur along Blake Drive between Garner Drive and 98th Avenue (191 vehicles per hour during the PM peak hour). The ambient traffic noise levels, project-generated traffic volumes, and predicted project-generated traffic noise for this roadway segment are summarized in Table 17 below. Traffic noise is expected to increase by about less than 1 dBA Leq along Blake Drive between Garner Drive and 98th Avenue. Because this is the roadway segment with the greatest predicted increase in traffic volumes, traffic noise increases along other roadway segments would be less than 1 dBA Leq. This is below the 5-dBA significance threshold for project-generated traffic noise. Therefore, implementation of the 2019 project would not result in a significant increase in traffic noise along local area roadways.

TABLE 17 AMBIENT TRAFFIC NOISE, PROJECT-GENERATED TRAFFIC VOLUMES AND PREDICTED PROJECT-GENERATED TRAFFIC NOISE

Roadway Segment	Existing Ambient Traffic Noise Levels (dBA Leq)	2019 Project-Generated Traffic Volume (Vehicle/Hour)	Predicted 2019 Project-Generated Traffic Noise (dBA Leq at 50 Feet)	Existing+2019 Project Traffic Noise Levels (dBA Leq)	Estimated Increase in Noise (dBA Leq)
Blake Drive between Garner Drive and 98th Avenue (PM Peak)	64-73	191	52.6	64-73	<1

Source: Madison Park Traffic Impact Analysis, Fehr & Peers, 2019
Notes: Traffic noise model outputs are included in Appendix A. FHWA TNM Version 2.5 model was used for these results.
Noise analysis completed for this CEQA analysis per plans received on December 10, 2018 considered more work/live units as well as more parking units than what is shown on newer plans submitted on May 26, 2020. The intersection counts would decrease for the project with newer plans. Therefore, this noise analysis provides a worst-case analysis and a revised analysis is not needed.

[60] City of Oakland, 2005. City of Oakland General Plan, Noise Element, March.

[61] The City of Oakland General Plan notes that existing traffic noise levels are not expected to change substantially over the 20-year period between 2005 and 2025 (i.e., changes in noise levels would not be distinguishable) given the minor changes expected to occur in traffic levels. Therefore, existing noise levels at the project site and its vicinity from traffic along the surrounding streets are assumed to be the same as what is indicated in the 2025 roadway noise contours, which range from 60-65 dBA L_{dn}. Railroad/BART noise range from 65-70 dBA L_{dn} at the project site.

[62] California Department of Transportation (Caltrans), 1998. Technical Noise Supplement, October.

Cumulative traffic noise levels generated by past, present, and probable future projects, including this project, could result in a significant cumulative noise increase along local area roadways. As indicated in Criterion J.c, a project is considered to contribute to a significant cumulative impact if (1) the cumulative increase results in a 5-dBA permanent increase in ambient noise levels in the project vicinity, and (2) 3 dBA of the cumulative increase is attributable to the 2019 project.

Under a cumulative scenario, the assessment of AM and PM peak hour traffic volumes at three intersections surrounding the project site indicates that the highest traffic volume increases would occur along 98th Avenue between Pippin Street and San Leandro Street (686 vehicles per hour during the PM peak hour).

The ambient traffic noise levels, cumulative traffic volumes, and predicted traffic noise for this roadway segment are summarized in Table 18 below. Cumulative traffic noise is expected to increase by about 2 dBA Leq along 98th Avenue between Pippin Street and San Leandro Street during the PM peak hour, which is below the 5-dBA significance threshold for cumulative impacts. Because this is the roadway segment with the greatest predicted increase in traffic volume, traffic noise increases along other roadway segments would be less than 2 dBA Leq, and therefore would be below the 5-dBA significance threshold for cumulative impacts. As a result, the cumulative traffic noise increase along local area roadways is less than significant.

TABLE 18 AMBIENT TRAFFIC NOISE, CUMULATIVE TRAFFIC VOLUMES AND PREDICTED CUMULATIVE TRAFFIC NOISE

Roadway Segment	Existing Ambient Traffic Noise Levels (dBA Leq)	Cumulative Plus 2019 Project Traffic Volume (Vehicle/Hour)	Predicted Cumulative Plus 2019 Project Traffic Noise (dBA Leq at 50 Feet)	Existing+Cumulative Plus 2019 Project Traffic Noise Levels (dBA Leq)	Estimated Highest Increase in Noise (dBA Leq)
98th Avenue between Pippin Street and San Leandro Street (PM Peak)	64-73	686	60.3	66-73	2

Source: Madison Park Traffic Impact Analysis, Fehr & Peers, 2019.
Notes: Traffic noise model outputs are included in Appendix A. FHWA TNM Version 2.5 model was used for these results.
Noise analysis completed for this CEQA analysis per plans received on December 10, 2018 considered more work/live units as well as more parking units than what is shown on newer plans submitted on August 28, 2019. The intersection counts would decrease for the project with newer plans. Therefore, this noise analysis provides a worst-case analysis and a revised analysis is not needed.

Noise Exposure during Construction and Operation (Criterion J.d)

Construction workers could be exposed to excessive noise from the heavy equipment used during construction of the 2019 project (Table 15). However, noise exposure of construction workers is regulated by the California Occupational Safety and Health Administration (Cal/OSHA). Title 8, Subchapter 7, Group 15, Article 105 of the California Code of Regulations (Control of Noise Exposure) sets noise exposure limits for workers, and requires employers who have workers that may be exposed to noise levels above these limits to establish a hearing conservation program, make hearing protectors available, and keep records of employee noise exposure measurements. The construction contractor for the 2019 project would be subject to these regulations, and compliance with these Cal/OSHA regulations would ensure that the potential of construction workers to be exposed to excessive noise is less than significant.

Based on the roadway noise contours and the railroad/BART noise contours in the City of Oakland General Plan, combined noise levels (both roadways and railroad/BART) range from 66 to 71 dBA L_{dn} at the project site and its vicinity.[63,64] The local noise environment was further characterized when the Arcadia Park EIR was prepared. The range for the ambient noise levels in the project area was determined to be 62 to 82 dBA L_{dn}. Both the noise contours in the General Plan and the Arcadia Park EIR indicate occupants of the 2019 project would be subject to ambient outdoor noise levels that are above 70 dBA L_{dn}. This noise environment is regarded as "normally unacceptable" for residential and commercial land uses. The City of Oakland General Plan indicates that development within a "normally unacceptable" environment may be undertaken only if a detailed analysis of the noise-reduction requirements is conducted, and if highly effective noise insulation and abatement features are included in the design. The implementation of SCA-NOI-5: Exposure to Community Noise (#67) would enforce compliance of the City of Oakland General Plan's community noise exposure level requirements. Implementation of this SCA would fulfill the requirements of Mitigation Measure Noise-1 from the Arcadia Park EIR. Impacts to the environment as they relate to ambient noise are not within the scope of the required CEQA analysis. The information above and below are provided for informational use only.

SCA-NOI-6: Exposure to Community Noise (#66) requires noise reduction measures to be incorporated into building design based upon the recommendations of a qualified acoustical engineer. The noise reduction measures would be required to reduce interior noise levels to 45 dBA L_{dn} for residential units and 50 dBA L_{eq} for commercial spaces.

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[63] City of Oakland, 2005. City of Oakland General Plan, Noise Element, March.

[64] The City of Oakland General Plan notes that existing traffic noise levels are not expected to change substantially over the 20-year period between 2005 and 2025 (i.e., changes in noise levels would not be distinguishable) given the minor changes expected to occur in traffic levels. Therefore, existing noise levels at the project site and its vicinity from traffic along the surrounding streets are assumed to be the same as what is indicated in the 2025 roadway noise contours, which range from 60-65 dBA L_{dn}. Railroad/BART noise range from 65-70 dBA L_{dn} at the project site.

These noise levels are consistent with the requirements of the California Building Code. Sound Transmission Class (STC) rated windows, exterior doors (such as balcony doors), and exterior walls are commonly used to control interior noise from exterior sources. A STC rating roughly equals the decibel reduction in noise volume that a wall, window, or door can provide.[65] Given that the ambient noise environment at the project site currently ranges from about 62 to 82 dBA L_{dn}, the use of sound-rated windows, exterior doors, and exterior walls with STC ratings ranging from about STC 32 to about STC 37 would need to be used in order to reduce interior noise levels from exterior sources to about 45 dBA L_{dn} for residential units and 50 dBA L_{eq} for commercial spaces, thereby satisfying the interior noise standards for both residential and commercial spaces. The noise control measures are required to be submitted to the City of Oakland for review and approval prior to the issuance of a construction-related permit. Compliance with SCA-NOI-6 would therefore reduce the potential of future occupants of the proposed development to be exposed to noise in excess of standards to a less-than-significant level.

Construction and Operational Vibration (Criterion J.e)

Construction activities can result in varying degrees of ground vibration, depending on the equipment, activity, and relative proximity to sensitive receptors. The vibration levels for construction equipment that could be used at the project site are summarized in Table 19. Although the table provides one vibration level for each piece of equipment, it should be noted that there is considerable variation in reported ground vibration levels from construction activities, primarily due to variation in soil characteristics. Vibration levels are calculated at 40 feet from the vibration source (where the nearest existing and future residences would be located) based on the known reference levels at 25 feet from the vibration source (which is also shown in Table 17). Vibration levels

TABLE 19 VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Reference PPV at 25 Feet (in/sec)	Reference RMS at 25 Feet (VdB)	PPV at 40 Feet (in/sec)	RMS at 40 Feet (VdB)
Vibratory Roller	0.210	94	0.104	88
Large Bulldozer	0.089	87	0.044	81
Loaded Truck	0.076	86	0.038	80
Jackhammer	0.035	79	0.017	73
Small Bulldozer	0.003	58	0.001	52

Notes: Based on vibration levels at 25 feet, the following propagation adjustment was applied to estimate PPV vibration levels at 40 feet assuming:

$PPV2 = PPV1 \times (D1/D2)^{1.5}$

Where: PPV1 is the reference vibration level at a specified distance.
PPV2 is the calculated vibration level.
D1 is the reference distance (in this case 25 feet).
D2 is the distance from the equipment to the receiver.

[65] U.S. Department of Housing and Urban Development (HUD), undated. Noise Notebook, Chapter 4 Supplement, Sound Transmission Class Guidance.

Based on vibration levels at 25 feet, the following propagation adjustment (FTA, 2018) was applied to estimate RMS vibration levels at 40 feet assuming:

$RMS2 = RMS1 - 30 \, Log_{10} \, (D2/D1)$

Where: RMS1is the reference vibration level at a specified distance.
RMS2 is the calculated vibration level.
D1 is the reference distance (in this case 25 feet).
D2 is the distance from the equipment to the receiver.

Source: Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual. FTA Report No.0123. September.

are not calculated at industrial land uses as there are no applicable vibration criteria for industrial land uses.[66]

Table 20 and Table 21 summarize the vibration criteria to prevent disturbance of residences and to prevent damage to structures, respectively. In this analysis, the "Infrequent Events" criterion is applied to construction equipment.

TABLE 20 VIBRATION CRITERIA TO PREVENT DISTURBANCE – RMS (VDB)

Land Use Category	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Residences and buildings where people normally sleep	72	75	80

[a] More than 70 vibration events of the same kind per day or vibration generated by a long freight train.
[b] Between 30 and 70 vibration events of the same kind per day.
[c] Fewer than 30 vibration events of the same kind per day.
Source: Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual. FTA Report No.0123. September.

TABLE 21 VIBRATION CRITERIA TO PREVENT DAMAGE TO STRUCTURES

Building Category	PPV (in/sec)	RMS (VdB)
Reinforced-concrete, steel, or timber (no plaster)	0.5	102
Engineered concrete and masonry (no plaster)	0.3	98
Non-engineered timber and masonry buildings	0.2	94
Buildings extremely susceptible to vibration damage	0.12	90

Source: Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual. FTA Report No.0123. September.

Based on the estimated construction equipment generated vibration levels in Table 19, construction-generated vibration levels may be as high as 88 RMS VdB at existing and future residences when the equipment is at its nearest point.

[66] Federal Transit Administration, 2018. Transit Noise and Vibration Impact Assessment Manual. FTA Report No.0123. September.

It should be noted that construction vibration is exempt from the standard indicated in Chapter 17.120.060 of City of Oakland's Municipal Code, and therefore, the vibration generated by construction would not have the potential to exceed any regulatory standards. However, vibration levels are compared with the criteria established by the Federal Transit Administration to fulfill the requirements of checklist Criterion J.e.

Although vibration levels would exceed the 80-RMS VdB Infrequent Events threshold for the residences and buildings where people normally sleep (Table 20), and potentially disturb existing and future residences, the vibration would be temporary since the locations of grading, soil compaction, and other construction activities that would require the use of construction equipment with the potential to exceed the 80-RMS VdB Infrequent Events threshold would vary over time across the site. Therefore, the impacts of these activities on any given receptor would not be expected to last more than a few hours or days at a time.

In addition, SCA-NOI-1: Construction Days/Hours (#61) limits construction activities to the hours between 7:00 a.m. and 7:00 p.m. Monday through Friday, and limits construction with the potential to generate extreme noise (which is often correlated with the potential to generate high vibration) to the hours between 8:00 a.m. and 4:00 p.m. This restricts any impact to normal daytime hours, thereby reducing the likelihood of disturbance of residents (i.e., through interfering with sleep). Therefore, the potential for construction generated vibration to disturb existing and future residences is less than significant.

Vibration generated during construction of the project would not be expected to damage either existing or future buildings. As indicated in Table 19, construction-generated vibration levels would be below the applicable thresholds (see Table 21) that cause damage to buildings. Therefore, the potential for construction-generated vibration to cause damage to existing and future buildings is less than significant.

The intended residential use of the 2019 project does not include any sources that would generate vibration that would be perceptible to people during operational period. However, as summarized in the Arcadia Park EIR, the vibration produced by the BART trains was found to be below the threshold of human perception, while the Union Pacific trains could produce vibrations that could be felt in the homes closest to San Leandro Street. Under the requirement of SCA-NOI-9: Exposure to Vibration (#68), the project would submit a Vibration Reduction Plan and implement vibration reduction measures to reduce the exposure of on-site receptors on the project site to acceptable levels of groundborne vibration indicated in Table 20. Design considerations may include isolated foundation trenching. Implementation of SCA-NOI-9: Exposure to Vibration (#68) would reduce the vibration levels for on-site buildings and sensitive receptors to a less-than-significant level. The Arcadia Park EIR cited Mitigation Measure Noise-3, which requires the project sponsor to retain an acoustical engineer during design to review and provide input to reduce the potential of vibration amplification on upper floors of the residences and requires a full disclosure of statement of the train lines to be made aware to future residents, which is functionally equivalent to SCA-NOI-9: Exposure to Vibration (#68), without the disclosure statement. Given that SCA-NOI-9: Exposure to Vibration (#68) does not include a full disclosure statement, the Arcadia PARK EIR Mitigation Measure Noise-3 has be included in the Mitigation and Monitoring Reporting Program (MMRP) below in Attachment A.

Conclusion

Based on an examination of the Program EIRs and the Arcadia Park EIR, the 2019 project would not result in any significant impacts related to noise. Further, based on an examination of the analysis and the findings and conclusions of the Arcadia Park EIR, implementation of the project would not substantially increase the severity of potentially significant impacts identified in the Arcadia Park EIR, nor would it result in new significant impacts related to noise that were not identified in the Arcadia Park EIR.

With implementation of the City's SCAs, the project would not result in any significant project or cumulative impacts related to noise and no mitigation measures are required. Compliance with the City's SCAs, including SCA-NOI-1: Construction Days/Hours (#61), SCA-NOI-2: Construction Noise (#62), SCA-NOI-3: Extreme Construction Noise (#63), SCA-NOI-4: Construction Noise Complaints (#65), SCA-NOI-5: Exposure to Community Noise (#66), and SCA-NOI-6: Operational Noise (#67), as discussed above, would ensure that the 2019 project would not result in significant impacts related to noise. These SCAs are included in Attachment A: Standard Conditions of Approval and Mitigation Monitoring and Reporting Program.

K. POPULATION AND HOUSING

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Induce substantial population growth in a manner not contemplated in the General Plan, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extensions of roads or other infrastructure), such that additional infrastructure is required but the impacts of such were not previously considered or analyzed.	■	❐	❐
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere in excess of that contained in the City's Housing Element	■	❐	❐
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere in excess of that contained in the City's Housing Element.	■	❐	❐

Previous CEQA Documents Findings

Population, housing, and employment were analyzed in the Program EIRs. Both the 1998 LUTE EIR and 2010 Housing Element EIR and 2014 Addendum found all potential population and housing impacts to be less than significant, and therefore no mitigation requirements or SCAs were required. However, the 1998 LUTE EIR cited a significant and unavoidable effect associated with increased employment in comparison to regional ABAG projections, and thus, an increase in housing demand. It identified mitigation measures that would create a database of underutilized parcels to accommodate the growth in housing demand.

The Initial Study prepared in association with the Arcadia Park EIR concluded that the Arcadia Park project would result in an estimated 950 new residents as the result of the construction of up to 400 residential units.[67] This impact was identified as a less-than-significant impact, as the increase in population was within the ABAG projections for the City of Oakland as a whole. Indirect growth inducement through the expansion of roads and other utilities was also studied in the Arcadia Park EIR, which concluded that any growth inducing impacts would be less-than-significant, as the expansion of roads and

[67] This was identified in the Arcadia Park Initial Study which was included as Appendix A to the Draft EIR.

other utilities was for the sole purpose of serving the new homes in the Arcadia Park project. The Initial Study prepared in association with the Arcadia Park EIR also found that implementation of the Arcadia Park project would not result in the displacement of existing homes or persons, as the project site was previously used for industrial and commercial activities.

Project Analysis

Population Growth and Displacement of Housing and People (Criteria K.a through K.c)

The 2019 project would develop the existing vacant parcels with a new mixed-use building with a total of approximately 399 residential units, approximately 11,688 square feet of work/live (9 work/live units) and 2,468 square feet of commercial/retail space. The construction of a total of approximately 399 new residential units would result in approximately 994[68] new residents. The construction of approximately 2,468 square feet of commercial and retail space, and approximately 11,688 square feet of work/live space would result in approximately 29 permanent employees on-site.[69] However, this increase in population would be less than significant, as it is within the ABAG projections for the City of Oakland, which projects the population of Oakland to grow by nearly 25,000 people between 2015 and 2020[70]. New roads and utilities would be constructed, but these would not lead to any indirect growth inducing impacts, as the expansion of these services would only occur within the project boundary. Although the 2019 project includes more residential and work/live commercial space than was anticipated in the Arcadia Park project, the 2019 project would not result in any significant population impacts based on the City's significance criteria such that the project would induce substantial population growth in a manner not contemplated in the General Plan either directly, or indirectly not would the project displace substantial numbers of existing housing necessitating the construction of replacement housing elsewhere in excess of that contained in the City's Housing Element; or displace substantial numbers of people, necessitating the construction of replacement elsewhere in excess of that contained in the City's Housing Element. As a result, this less-than-significant finding is consistent with the findings of the Arcadia Park EIR,

Lastly, the project site is currently a vacant lot with no housing units. The 2019 project would therefore not cause any impacts related to the displacement of people or existing

[68] Based on average of 2.49 persons per household (2015-2023 Housing Element, 2010 US Census Data, p. 114, Table 3-5).

[69] Based on a retail average of 1 employee per 500 square feet. Note that a variety of uses, including office and/or light industrial, may occupy the non-residential component of the work/live units—corresponding to about 25,000 square feet, or 55 percent of the work/live unit space.

[70] Population projections performed by the Association of Bay Area Governments in 2013 predicted that Oakland's population would be 414,700 in 2015 and 439,600 in 2020. 439,600-414,700=24,900. Association of Bay Area Governments, 2013. Projections 2013: Table P2013 CITY.

housing units. Furthermore, the application of SCA-POP-1: Affordable Housing Impact Fee (#71) would ensure that the project provides funding to subsidized, affordable housing developments, mitigating the impacts to population and housing to less-than-significant levels.

Conclusion

Consistent with the findings of the Arcadia Park EIR, the 2019 project would not result in any significant impacts related to population or housing. Further, based on an examination of the analysis, findings, and conclusions of the Program EIRs, implementation of the project would not substantially increase the severity of impacts identified in the Arcadia Park EIR and the other Program EIRs. Nor would it result in new significant impacts related to population or housing that were not previously identified in the Program EIRs. Although indirect displacement is not considered an impact under CEQA, implementation of SCA-POP-1: Jobs/Housing Impact Fee (#70) and SCA-POP-2: Affordable Housing Impact Fee (#71) would mitigate any indirect displacement impacts to less-than-significant levels.

L. PUBLIC SERVICES, PARKS, AND RECREATION FACILITIES

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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 ▪ Other public facilities	■	❐	❐
b. Increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or include recreational facilities or require the construction or expansion of recreational facilities that might have a substantial adverse physical effect on the environment.	■	❐	❐

Previous CEQA Documents Findings

The 2010 Housing Element EIR and 2014 Addendum found all potential public services impacts to be less than significant and therefore no mitigation measures or SCAs were required. The 1998 LUTE EIR cited a significant and unavoidable effect associated with firefighting and evacuation constraints. It identified a mitigation measure, which would require the construction of a fire station in the North Oakland Hills to address the increase in population and housing.

The Initial Study prepared in association with the Arcadia Park EIR found that impacts to Public Services, Parks, and Recreation would be less than significant.

Project Analysis

Public Services and Parks and Recreation (Criteria 12a and 12b)

The 2019 project would create demands on public services typical of a mixed-use building containing a total of approximately 399 residential units with approximately 2,468 square feet of retail space and approximately 11,688 square feet of work/live space. However, the development would occur in an urban area already served by public services and recreation facilities, and the Program EIRs have consistently determined that the anticipated growth would not impose a burden on existing public services to create a significant impact.

The 2019 project represents a modification from the development envelope analyzed in the Arcadia Park EIR. The Arcadia Park EIR analyzed 366 residential units with no commercial square footage. As of 2019, there are a total of 168 residential units that have been built, and the 2019 project includes 399 units, which is a net increase of 201 units. In addition, the 2019 project is proposing approximately 11,688 square feet of commercial space (split between the 9 work/live units, and the 2,468 square feet of retail space) . The need for additional fire protection, police officers or library staff would not trigger a significant impact under CEQA unless a new facility would be needed, the construction of which would result in a significant impact. An economic or social change by itself shall not be considered a significant effect on the environment. [71] The development as part of the 2019 project would generate a net increase in property taxes and other fees providing additional monies for the City's General Fund to cover costs associated with increased operational costs such as additional police and fire personnel. Payment of the Capital Improvements Impact Fee would assist in funding new, expanded, or improved facilities (not maintenance or operating costs) needed to provide expanded services, including those that may be triggered by new development. [72] Compliance with standard City practices such as adherence to General Plan policies N.12.1, N.12.2, N.12.5, FI-1, and FI-2 would further ensure the project would have no significant impacts related to fire, police and library services. While the 2019 project does represent a modification from the previously analyzed project resulting in more demand for public services than originally anticipated, this does not result in any new significant impacts such that the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives.

As expressed above, while the 2019 project does represent a modification from the development envelope resulting in more demand for existing neighborhood or regional

[71] Briscoe , Ivester and Bazel, A Project's Need For Public Services Is Not an Environmental Impact Requiring Mitigation, written July 10, 2012. Available at: https://briscoelaw.net/07-10-12/, accessed May 14, 2019.

[72] Oakland Transportation and Capital Improvements Impact Fee Nexus Analysis, Urban Economics, Hausrath Economics Group, BKF Engineers and Fehr and Peers, March 10, 2016.

and local parks, the project would not increase the use of these parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. In addition, as described above, payment of the Capital Improvements Impact Fee would assist in funding new, expanded, or improved facilities (not maintenance or operating costs) needed to provide expanded recreational centers and facilities, including those that may be triggered by new development. [73] The 2019 project would also include an estimated 82,642 square feet of open space including 36,797 square feet of Group Usable Open Space and 45,845 square feet of private open space substitution.

In addition, adherence to the General Plan's Open Space, Conservation and Recreation Element (OSCAR) Policies 3.1, 3.3, and 3.10 would ensure any potential impacts to recreational facilities are not significant.

The 2019 project would increase student enrollment at local schools. Pursuant to Senate Bill 50, the project sponsor would be required to pay school impact fees, which are established to offset potential impacts from new development on school facilities, and would mitigate potential impacts to a less-than-significant level.

Conclusion

Though the 2019 project is proposing more density and intensity, as well as adding commercial square footage that was not considered in the Arcadia Park EIR, these changes would not result in an increase in severity of significant impacts. Therefore, consistent with the findings of the Arcadia Park EIR, the project would not result in any significant impacts related to public services, parks, and recreation. Further, based on an examination of the Arcadia Park EIR and the Program EIRs, implementation of the 2019 project would not result in any increase in the severity of any previously identified impacts, nor would it result in new significant impacts related to public services, parks, and recreation that were not previously identified in the Arcadia Park EIRs and Program EIRs. The Arcadia Park EIRs did not identify any mitigation measures related to public services, parks, and recreation, and none would be required for the 2019 project. The 2019 project would be required to comply with SCA-PUB-1: Capital Improvements Impact Fee (#72), and SCA-PUB-2: Public Improvements (#11), which would ensure that any impacts to public services, parks, and recreation would remain less than significant.

[73] Oakland Transportation and Capital Improvements Impact Fee Nexus Analysis, Urban Economics, Hausrath Economics Group, BKF Engineers and Fehr and Peers, March 10, 2016.

M. TRANSPORTATION AND CIRCULATION

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Conflict with a plan, ordinance, or policy addressing the safety or performance of the circulation system, including transit, roadways, bicycle, and pedestrian facilities (except for automobile level of service or other measures of vehicle delay); or	■	❒	❒
b. Cause substantial additional vehicle miles traveled (per capita, per service population, or other appropriate efficiency measure); or	■	❒	❒
c. Substantially induce additional automobile travel by increasing physical roadway capacity in congested areas or by adding new roadways to the network.	■	❒	❒

Previous CEQA Documents Findings

The 2010 Oakland Housing Element EIR and 2014 Addendum found significant and unavoidable impacts related to traffic delays. The remaining transportation and circulation impacts were found to have no impacts or less-than-significant impacts. In addition, the 1998 LUTE EIR found impacts to intersection operations to be less than significant with implementation of mitigation measures or SCAs. Impacts to roadway segments under the 1998 LUTE EIR were found to be significant and unavoidable. The remaining transportation and circulation impacts under the 1998 LUTE EIR were found to have no or less-than-significant impacts.

The Arcadia Park EIR included a comprehensive evaluation of the Arcadia Park project's impacts on transportation and circulation including traffic operations, traffic hazards and safety, emergency access, construction period, and consistency with adopted policies, plans, and programs regarding public transit, bicycle, and pedestrian facilities. The Arcadia Park EIR evaluated traffic operations at 16 intersections and 8 freeway and arterial segments within the project vicinity for potential impacts. The thresholds of significance for the traffic operations analysis in the Arcadia Park EIR were based on vehicle level of service (LOS).

The Arcadia Park EIR identified eight significant impacts, including impacts at the International Boulevard/92nd Avenue, easternmost project driveway (Armstrong Drive)/98th Avenue, San Leandro Street/98th Avenue, and International Boulevard/98th Avenue intersections. The Arcadia Park EIR also identified significant impacts related to the design of the internal intersections within the project site and impacts during the construction period. The Arcadia Park EIR identified various mitigation measures to reduce most of the significant impacts to less-than-significant levels. However, the impacts at the International Boulevard/92nd Avenue, San Leandro Street/98th Avenue, and International Boulevard/98th Avenue intersections were identified as significant and unavoidable in the Arcadia Park EIR.

Project Analysis

Conflicts with Plans, Ordinances, or Policies Relating to Safety, or Performance of the Circulation System (Criteria N.a)

The 2019 project is consistent with applicable plans, ordinances, and policies, and would not cause a significant impact by conflicting with adopted plans, ordinances, or policies addressing the safety and performance of the circulation system, including transit, roadways, bicycle lanes, and pedestrian paths (except for automobile level of service or other measures of vehicle delay).

The 1998 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 2019 project would encourage the use of non-automobile transportation modes by providing residential and non-residential uses in a dense, walkable urban environment that is served by local transit service.

The 2019 project is consistent with both the City's Pedestrian Master Plan and Bicycle Master Plan as it would not make major modifications to existing pedestrian or bicycle facilities in the surrounding areas and would not adversely affect installation of future facilities. Further, because the 2019 project would generate more than 50 peak hour trips, SCA-TRAN-4: Transportation and Parking Demand Management (#77) would require the preparation and implementation of a Transportation and Demand Management Plan (TDM Plan). The TDM Plan includes operational strategies as well as infrastructure improvements that encourage the use of non-automobile travel modes.

Overall, the 2019 project would not conflict with adopted plans, ordinances, or policies addressing the safety and performance of the circulation system. This is a less-than-significant impact and no mitigation measures are required.

In addition, the 2019 project is consistent with the Arcadia Park EIR, which evaluated the impacts of a similar development at the project site as described below.

<u>Consistency with the Arcadia Park EIR</u>

The Arcadia Park EIR evaluated the impacts of a project consisting of 366 residential units on the transportation network primarily using LOS per the City of Oakland Significance

Criteria at the time. One-hundred sixty-four single-family units have been completed since the certification of the Arcadia Park EIR.

Although the Arcadia Park EIR included a LOS analysis, an updated LOS analysis is not required because the City has updated its Significance Criteria and eliminated LOS and other congestion-based metrics. The automobile trip generation for the 2019 project compared to the Arcadia Park project as well as the current status and applicability of the impacts and mitigation measures identified in the Arcadia Park EIR are described below.

Project Trip Generation

Trip generation is the process of estimating the number of vehicles that would likely access the project. Trip generation data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual* (Tenth Edition) was used as a starting point to estimate the vehicle trip generation. Table 22 presents the trip generation for the 2019 project.

ITE does not include trip generation data for work/live units, which display unique travel behavior. Residents of work/live units are expected to complete some or all of their work from home, rather than commuting to their place of employment. Therefore, the ITE data for mid-rise multi-family housing (Code 221) was used to estimate trip generation for the residential component of the work/live units. A variety of uses, including office, retail, and/or light industrial, may occupy the non-residential component of the work/live units. Since office and retail uses are the higher trip generating uses, this analysis applies the ITE data for office (Code 710) and retail (Code 820) to the non-residential component of the work/live units which is about 55 percent[74] of the 20,914 square feet of the work/live and live/work units, corresponding to about 5,750 square feet of office and 5,570 square feet of retail for a total of 11,500 square feet).

To account for the internalization of residents who work on-site, a 50 percent reduction in home-based work trips was assumed based on the assumption that each unit would have an average of two workers and one would work on-site. According to the Alameda County Transportation Commission (CTC) Countywide Travel Demand Model, home-based work trips account for 20 percent of daily, 44 percent of AM peak period, and 24 percent of PM peak period trips. Therefore, reductions of 10 percent for daily trips (50 percent x 20 percent), 22 percent for AM trips (50 percent x 44 percent) and 12 percent for PM trips (50 percent x 24 percent) is applied to the residential trips and the same reduction is applied to the non-residential trips to account for both ends of these internalized trips.

[74] The most recent project submittal shows that commercial space accounts for approximately 45 percent of the total floor area in the work/live and live/work units. The analysis conservatively assumes that 55 percent of these units' floor area consists of commercial uses.

The ITE data is based on data collected at mostly single-use suburban sites where the automobile is often the only travel mode. However, the project site is in a mixed-use urban environment where walking, biking, and transit trips are a larger proportion of total trips. Since the 2019 project is more than a mile from the Coliseum BART Station, this analysis reduces the ITE-based trip generation by 23.1 percent to account for the non-automobile

TABLE 22: VEHICLE TRIP GENERATION

Land Use	Size [a]	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Townhomes [b]	122 DU	880	13	45	58	44	26	70
Apartments [c]	270 DU	1,470	24	67	91	70	45	115
Work/live & Live/work Units								
Office [d]	5.75 KSF	60	6	1	7	1	6	7
Retail [e]	5.75 KSF	220	3	2	5	11	11	22
Residential [c]	16 DU	90	2	4	6	5	3	8
Internalization [f]		-20	-1	-1	-2	-1	-1	-2
Subtotal		*350*	*10*	*6*	*16*	*16*	*19*	*35*
High Turnover Restaurant [g]	2.5 KSF	280	14	11	25	15	9	24
Subtotal		2,980	61	129	190	145	99	244
Non-Auto Adjustment [h]		-690	-14	-30	-44	-33	-23	-56
Net-New Vehicle Trip Generation		**2,290**	**47**	**99**	**146**	**112**	**76**	**188**

a. DU = Dwelling Units, KSF = 1,000 square feet
b. ITE Trip Generation (10th Edition) land use category 220 (Multifamily Housing - Low Rise, General Urban/Suburban):
Daily: T = 7.56*(X)-40.86
AM Peak Hour: Ln(T) = 0.95*Ln(X)-0.51 (23% in, 77% out)
PM Peak Hour: Ln(T) = 0.89*Ln(X)-0.02 (63% in, 37% out)
c. ITE Trip Generation (10th Edition) land use category 221 (Multifamily Housing - Mid Rise, General Urban/Suburban):
Daily: T = 5.45*(X)-1.75
AM Peak Hour: Ln(T) = 0.98*Ln(X)-0.98 (26% in, 74% out)
PM Peak Hour: Ln(T) = 0.96*Ln(X)-0.63 (61% in, 39% out)
d. ITE Trip Generation (10th Edition) land use category 710 (General Office Building, General Urban/Suburban):
Daily: Ln(T) = 9.74*X
AM Peak Hour: T = 1.16*X (86% in, 14% out)
PM Peak Hour: Ln(T)=1.15*X (16% in, 84% out)
e. ITE Trip Generation (10th Edition) land use category 820 (Shopping Center, General Urban/Suburban):
Daily: Ln(T) = 37.75*X
AM Peak Hour: T = 0.94*X (62% in, 38% out)
PM Peak Hour: T = 3.81*X (48% in, 52% out)
f. Residential trips adjusted by -10% (daily), -22% (AM) and -12% (PM) to account for 50 percent internalization of home-based work trips. Per the Alameda CTC Countywide Travel Demand Model, home-based work trips comprise 20% of daily, 44% of AM peak period and 24% of PM peak period trips for residential units. The non-residential trips also adjusted accordingly to account for the other end of the trips.
g. ITE Trip Generation (10th Edition) land use category 932 (High-Turnover Restaurant, General Urban/Suburban):
Daily: T = 112.18*(X)
AM Peak Hour: T = 9.94*(X) (55% in, 45% out)
PM Peak Hour: T = 9.77*(X) (62% in, 38% out)
h. The 23.1% reduction is based on the City of Oakland's *TIRG* for development in an urban environment more than 1.0 miles from a BART Station and over 10,000 people per square mile population density. Based on US Census data, the project census tract has a population of 5,311 people and is about 0.5 square miles, corresponding to a population density of 10,973 people per square mile.
i. Trip generation analysis was completed based on plans dated August 26, 2019. The revised project based on plans dated May 26, 2020 would not generate more trips and so this trip generation analysis and subsequent analysis based on this trip generation represents a worst-case scenario.
Source: Fehr and Peers, 2019.

trips. This reduction is consistent with City of Oakland Transportation Impact Review Guidelines (TIRG) and based on Census commute data for Alameda County from the 2014 5-Year Estimates of the American Community Survey (ACS), which shows that the non-automobile mode share for urban areas over a mile from a BART Station is about 23.1 percent.

The proposed development would generate an estimated 2,290 daily, 146 AM peak hour, and 188 PM peak hour trips.

Table 23 presents the trip generation for the 168 units at the project site that have already been completed. The existing development is estimated to generate about 1,290 daily, 95 AM peak hour, and 128 PM peak hour trips.

TABLE 23: EXISTING VEHICLE TRIP GENERATION

			AM Peak Hour			PM Peak Hour		
Land Use	**Size [a]**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Single-Family Housing [b]	168 DU	1,680	31	93	124	105	62	167
Non-Auto Adjustment [c]		-390	-7	-22	-29	-24	-15	-39
Net-Existing Vehicle Trip Generation		**1,290**	**24**	**71**	**95**	**81**	**47**	**128**

a. DU = Dwelling Units
b. ITE Trip Generation (10th Edition) land use category 210 (Single-Family Detached Housing, General Urban/Suburban):
Daily: Ln(T) = 0.92*Ln(X)+2.71
AM Peak Hour: T = 0.71*(X)+4.80 (25% in, 75% out)
PM Peak Hour: Ln(T) = 0.96*Ln(X)+0.20 (63% in, 37% out)
c. The 23.1% reduction is based on the City of Oakland's *TIRG* for development in an urban environment more than 1.0 miles from a BART Station and over 10,000 people per square mile population density.
Source: Fehr & Peers, 2018

Table 24 compares the trip generation between the combined already completed and proposed 2019 project and the Arcadia Park EIR. The currently proposed development combined with the already completed development are estimated to generate about 892 daily, 77 AM peak hour, and 95 PM peak hour more trips than estimated in the Arcadia Park EIR.

TABLE 24: VEHICLE TRIP GENERATION COMPARISON

Land Use	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Already Completed Development [a]	1,290	24	71	95	81	47	128
Project [b]	2,290	47	99	146	112	76	188
Total	*3,580*	*71*	*170*	*241*	*193*	*123*	*316*
2005 Arcadia Park EIR [c]	2,688	7	157	164	164	57	221
Difference	*+892*	*+64*	*+13*	*+77*	*+29*	*+66*	*+95*

a. See Table 23.
b. See Table 22.
c. Arcadia Park Residential Development Draft Environmental Impact Report published July 1, 2005.
Source: Fehr & Peers, 2019.

Arcadia Park EIR Impacts and Mitigation Measures

The Arcadia Park EIR identified significant impacts, primarily related to intersection LOS at several intersections. The mitigation measures, their current status, and applicability to the project are listed below:

- Mitigation Traffic-1 required the project sponsor to signalize the International Boulevard/92nd Avenue intersection. This mitigation has been implemented and no longer applies to the project.
- Mitigation Traffic-2 required the project sponsor to prepare a construction traffic management plan (TMP) for the project. This mitigation measure has been replaced by SCA #74, Construction Activity in the Public Right-of-Way, and no longer applies to the project.
- Mitigation Traffic-3 required the project to implement traffic control features, such as stop signs at intersections within the site. This mitigation has already been implemented in the parts of the project that have been completed. A thorough review of the internal site circulation was conducted as part of the site plan review for the project's non-CEQA transportation impact review (TIR). The traffic control features identified in the TIR will be included in the Conditions of Approval for the project. Thus, this mitigation measure no longer applies to the 2019 project.
- Mitigation Traffic-4 required the project sponsor to restrict Armstrong Drive at 98th Avenue to right-turn in/right-turn out only. This mitigation has been implemented and no longer applies to the 2019 project.
- Mitigations Traffic-5 and Traffic-7 required the re-striping of southbound San Leandro Street at 98th Avenue to provide exclusive southbound right-turn lanes. Based on the

traffic operations evaluation conducted as part of the non-CEQA TIR for the 2019 project, the 2019 project would have minimal effect on traffic operations at this intersection (the 2019 project would increase peak hour average delay at the intersection by less than one second during both AM and PM peak hours, which would not be noticeable to motorists); thus, the mitigation is not needed. Furthermore, the provision of exclusive southbound right-turn lanes at the intersection may increase pedestrian crossing distance and interfere with pedestrian and bicycle circulation at the intersection. Since the mitigation may conflict with the City's policy goals to promote non-automobile travel, the mitigation measure no longer applies to the project. The Arcadia Park EIR identified the impact at the San Leandro Street/98th Avenue intersection as significant and unavoidable.

- Mitigation Traffic-6 and Traffic-8 required the project sponsor to stripe an exclusive 100-foot northbound right-turn lane on International Boulevard at the International Boulevard/98th Avenue intersection. This mitigation is no longer applicable because the currently under construction East Bay Bus Rapid Transit (BRT) project is reconfiguring this intersection and the proposed right-turn lane can no longer be accommodated. The Arcadia Park EIR identified the impact at the International Boulevard/98th Avenue intersection as significant and unavoidable.

- As described above, the mitigation measures identified in the Arcadia Park EIR have already been implemented, have been replaced by City of Oakland's SCAs, or are no longer applicable to the 2019 project. In addition, based on the City's current TIRG, the significant impacts identified in the Arcadia Park EIR would no longer be considered significant impacts. Therefore, although the 2019 project combined with the portions of the Arcadia Park project that have already been constructed would generate more automobile trips than the 2019 project evaluated in the Arcadia Park EIR (an additional 892 daily trips), the project would not increase the severity of the significant impacts identified in the Arcadia Park EIR, nor would it result in new significant impacts related to traffic operations.

Cause Substantial Additional Vehicle Miles Traveled (Criteria N.b)

On September 21, 2016, the City of Oakland Planning Commission directed staff to update the CEQA Thresholds of Significance Guidelines related to transportation impacts in order to implement the directive from Senate Bill 743 to modify local environmental review processes by removing automobile delay, as described solely by LOS or similar measures of vehicular capacity or traffic congestion, as a significant impact on the environment pursuant to CEQA.[75] The Planning Commission's direction aligns with draft proposed guidance from the Governor's Office of Planning and Research and the City's approach to transportation impact analysis, with adopted plans and polices related to transportation, which promote the reduction of greenhouse gas emissions, the

[75] Steinberg, 2013. (Senate Bill SB 743)

development of multimodal transportation networks, and a diversity of land uses. Consistent with the Planning Commission direction and the Senate Bill 743 requirements, the City of Oakland published the revised TIRG on April 14, 2017 to guide the evaluation of the transportation impacts associated with land use development projects.

Many factors affect travel behavior, including density of development, diversity of land uses, design of the transportation network, access to regional destinations, distance to high-quality transit, development scale, demographics, and transportation demand management. Typically, low-density development that is located at a great distance from other land uses, in areas with poor access to non-single occupancy vehicle travel modes generate more vehicle travel compared to development located in urban areas, where a higher density of development, a mix of land uses, and non-single occupancy vehicle travel options are available.

Given these travel behavior factors, most of Oakland has lower VMT per capita and VMT per worker ratios than the nine-county San Francisco Bay Area region. Further, within the City of Oakland, some neighborhoods may have lower VMT ratios than others.

<u>VMT Estimate Approach</u>

Estimating VMT requires the use of travel demand models to fully capture the length of trips on the transportation network, as well as the changes in VMT behavior that may occur with the introduction of the project. This analysis presents use of the Metropolitan Transportation Commission (MTC) Travel Model to fully analyze the VMT impacts of the 2019 project.

Neighborhoods within Oakland are expressed geographically in transportation analysis zones (TAZ), which are used in transportation planning models for transportation analysis. The MTC Model includes 116 TAZs within Oakland that vary in size from a few city blocks in the downtown core, to multiple blocks in outer neighborhoods, to even larger geographic areas in lower-density neighborhoods.

The MTC Travel Model is a model that assigns all predicted trips within, across, or to/from the nine-county San Francisco Bay Area region onto the roadway network and the transit system by mode (single-driver and carpool vehicle, biking, walking, or transit) and transit carrier (bus, rail) for a particular scenario.

The travel behavior from MTC Travel Model is modeled based on the following inputs:

Socioeconomic data developed by the Association of Bay Area Governments (ABAG).

- Population data created using the 2000 US Census and modified using the open source PopSyn software.
- Zonal accessibility measurements for destinations of interest.

- Travel characteristics and vehicle ownership rates derived from the 2000 Bay Area Travel Survey (BATS).
- Observed vehicle counts and transit boardings.

The daily VMT output from the MTC Travel Model for residential and office uses comes from a tour-based analysis. The tour-based analysis examines the entire chain of trips over the course of a day, not just trips to and from the project site. In this way, all of the VMT for an individual resident or employee is included; not just trips into and out of the person's home or workplace. For example, a resident leaves their apartment in the morning, stops for coffee, and then goes to the office. In the afternoon, the resident heads out to lunch, and then returns to the office, with a stop at the drycleaners on the way. After work, the resident goes to the gym to work out, and then joins some friends at a restaurant for dinner before returning home. All the stops and trips within the resident's day form their "tour". The tour-based approach would add up the total number of miles driven over the course of her tour and assign it as her daily VMT.
Based on the MTC Travel Model, the regional average daily VMT per capita is 15.0 under 2020 conditions and 13.8 under 2040 conditions.

Thresholds of Significance for VMT

According to the City of Oakland TIRG, the following are thresholds of significance related to substantial additional VMT:

- For residential projects, a project would cause substantial additional VMT if it exceeds existing regional household VMT per capita minus 15 percent.
- For office projects, a project would cause substantial additional VMT if it exceeds the existing regional VMT per worker minus 15 percent.
- For retail projects, a project would cause substantial additional VMT if it results in a net increase in total VMT.

Screening Criteria

VMT impacts would be less than significant for a project if any of the identified screening criteria outlined below are met:

Small Projects: The project generates fewer than 100 vehicle trips per day

Low-VMT Areas: The project meets map-based screening criteria by being located in an area that exhibits below threshold VMT, or 15 percent or more below the regional average

Near Transit Stations: The project is located in a Transit Priority Area or within a one-half mile of a Major Transit Corridor or Stop[76] and satisfies the following:

- Has a Floor Area Ratio (FAR) of more than 0.75.
- Includes less parking for use by residents, customers, or employees of the project than other typical nearby uses, or less than required by the City (if parking minimums pertain to the site) or allowed without a conditional use permit (if minimums and/or maximums pertain to the site).
- And is consistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the MTC).

VMT Impact Analysis Screening

The project would satisfy the Low-VMT Area (#2) criterion as described below.

Criterion #1: Small Projects

As shown in Table 222 the project would generate more than 100 vehicle trips per day and therefore does not meet criterion #1.

Criterion #2: Low-VMT Area

The applicability of this criterion to each component of the project is described below.

- ***Residential (apartments, townhomes, and the residential component of the work/ live units)*** - Table 25 shows the 2020 and 2040 VMT per capita for TAZ 892, the TAZ in which the 2019 project is located, as well as the applicable VMT thresholds of 15-percent below the regional average. As shown in Table 25, the 2020 and 2040 average daily VMT per capita in the project TAZ are below the regional average minus 15-percent. Therefore, it is presumed that the residential components of the 2019 project would not result in substantial additional VMT.

[76] "Major transit stop" is defined in CEQA Section 21064.3 as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. See Chapter III, Purpose and Summary of this CEQA Document for a discussion on how this project meets this requirement.

TABLE 25 DAILY VEHICLE MILES TRAVELED SUMMARY

	Bay Area				TAZ 892	
	2020		2040			
Land Use	Regional Average	Regional Average minus 15%	Regional Average	Regional Average minus 15%	2020	2040
Residential (VMT per Capita)[a]	15.0	12.8	13.8	11.7	11.6	10.3

a. MTC Model results at analytics.mtc.ca.gov/foswiki/Main/PlanBayAreaVmtPerCapita and accessed in December 2018.
Source: Fehr & Peers, 2018.

- ***Work/Live Units*** - The non-residential component of the work/live units may be used as retail, office and/or production, distribution, and repair (PDR) uses. According to the TIRG, these uses should be screened by comparing the VMT per worker in the project TAZ to the regional average minus 15 percent. However, the non-residential component of the work/live units should not be screened based on the VMT per worker metric because these uses would not have typical employment behavior. It is expected that at least one worker in each of the work/live units would be the resident of that unit, which would eliminate the home-work commute trip for that worker. Considering that the home-work trips comprise most of the VMT per worker, the screening process of VMT per worker as recommended in the TIRG would not be applicable to the proposed non-residential component of the work/live units.

  At least one worker in the non-residential component of each work/live unit would be a project resident who would generate minimal VMT because they would not commute. Thus even if the non-residential component of each work/live unit has more than one non-resident employees that commute to and from the site with VMT per worker similar to the project TAZ, and considering the availability of non-automobile commute options in the project vicinity, and the mix, density, and proximity of residential and other uses in the area, it can be presumed that the non-residential component of the work/live units would not result in substantial additional VMT.[77]

- ***Retail*** - According to the TIRG, retail spaces less than 80,000 square feet are considered local-serving and are not expected to contribute to an increase in VMT. If all the non-residential space in the work/live units is used and live/work units is used

[77] The *Final Proposed Updates to the CEQA Guidelines* (OPR, November 2017), Section 15064.3(b)(3) recognizes that it may not be possible to quantitatively estimate VMT for some project types, and encourages a qualitative evaluation based on factors such as the availability of transit, proximity to other destinations, and other factors that may affect the amount of driving generated by a project.

as retail, as well as the 2,468 square footage of retail space the total retail in the project would be about 13,970 square feet, which is less than 80,000 square feet. Therefore, it is presumed that the retail component of the project would not result in substantial additional VMT.

Since all project components would not result in substantial additional VMT, 2019 project impacts with respect to VMT would be less than significant.

Criterion #3: Near Transit Stations

The 2019 project is approximately 1.3 miles south of the Coliseum BART Station. The nearest bus stop serving multiple bus routes is about 0.6 miles east of the site at the International Boulevard/98th Avenue intersection, where Route 1 operates along International Boulevard with 8-minute peak headways, and Route 98 operates along 98th Avenue with 20-minute peak headways. The 2019 project would not satisfy criterion #3 because it would not be within 0.5 mile of a rail transit station or within one-half mile of a bus stop at the intersection of two or more bus routes with peak headways of 15 minutes or less.

AC Transit is currently constructing the East Bay BRT project along International Boulevard. BRT service would replace the current Route 1 bus service with buses that would operate in exclusive lanes along International Boulevard. The nearest BRT stop to the project site would be on International Boulevard at 96th Avenue, about 0.6 miles to the east. Thus, although a BRT stop would be defined as a major transit stop, it would be more than 0.5 miles away from the project. Therefore, the 2019 project would not satisfy criterion #3 under future conditions.

<u>VMT Screening Conclusion</u>

As described above, VMT impacts would be less than significant for a project if any of the identified screening criteria outlined below are met: Small Projects, Low-VMT Areas, and Near Transit Stations. The project would satisfy the Low-VMT Areas (#2) criterion and would have a less–than-significant impact on VMT.

Substantially Induce Additional Automobile Travel (Criteria N.c)

The 2019 project would not modify the roadway network surrounding the project site. Therefore, it would not increase the physical roadway capacity and would not add new roadways to the network, and would not induce additional automobile traffic. This is a less-than-significant impact and no mitigation measures are required.

Conclusion

The 2019 project would not result in any significant impacts related to transportation or circulation. Further, based on an examination of the Arcadia Park EIR prepared for the project site, implementation of the 2019 project would not result in any increase in the severity of any previously identified impacts, nor would it result in new significant impacts related to transportation or circulation that were not previously identified in the Arcadia Park EIR. The mitigation measures identified in the Arcadia Park EIR have already been implemented, have been replaced by City of Oakland's SCAs, or are no longer applicable to the 2019 project. Further, implementation of the required SCAs would be applicable to the 2019 project and would ensure that transportation and circulation-related impacts associated with the 2019 project would be less than significant.

N. UTILITIES AND SERVICE SYSTEMS

Would the project:	Equal or Less Severity of Impact Previously Identified in the Previous CEQA Documents	Substantial Increase in Severity of Previously Identified Significant Impact in Previous CEQA Documents	New Significant Impact
a. Exceed wastewater treatment requirements of the San Francisco Bay RWQCB; require or result in construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or result in a determination by the wastewater treatment provider that 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, the construction of which could cause significant environmental effects.	■	❐	❐
b. 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, the construction of which could cause significant environmental effects.	■	❐	❐
d. Violate applicable federal, state, and local statutes and regulations relating to energy standards; or result in a determination by the energy provider that 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 the construction of new energy facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	■	❐	❐

Previous CEQA Documents Findings

Utilities and service systems were analyzed in the Program EIRs. The 2010 Housing Element EIR found all potential utilities and service system impacts to be less than significant and therefore no mitigation measures or SCAs were required. The 1998 LUTE EIR found potential impacts from heightened water demand, sewer flows, and drainage problems to be less than significant. The 1998 LUTE EIR also identified a significant and unavoidable impact associated with increased population in areas where firefighting and evacuation are constrained. East Oakland was not an area identified as a constrained area.

The Initial Study prepared in association with the Arcadia Park EIR found that the project would have less-than-significant impacts related to utilities and services.

Project Analysis

Water, Wastewater, and Stormwater (Criteria 14a and 14b)

Under existing conditions, most of the project site is covered with pervious surfaces. The 2019 project includes construction of new structures, driveways, streets, and sidewalks. Although the 2019 project would generate more stormwater and wastewater than is currently generated at the project site under existing conditions, the project site is exempt from hydromodification requirements, as discussed in *Section H, Hydrology and Water Quality*, and the post-project stormwater runoff is not required to match the pre-project condition.

Peak wet weather flows from the 2019 project are estimated to be approximately 0.328 cubic feet per second (cfs), which is equal to 212,000 gallons per day.[78] The East Bay Municipal Utilities District would perform both primary and secondary treatment on wastewater generated by the project, ensuring that it would not violate the wastewater treatment requirements of the San Francisco Bay Regional Water Quality Control Board (RWQCB).

As described in the Arcadia Park EIR and the City of Oakland 2015-2023 Housing Element, the City of Oakland Public Works Agency confirmed that wastewater facilities have sufficient available capacity to accommodate the project. As described in *Section H, Hydrology and Water Quality,* the city's storm water infrastructure in the area of the 2019 project is old and is currently at or over capacity, and that the existing storm drain in 92nd Avenue would be upsized. The former 15-inch diameter storm drain in 92nd Avenue was upsized to a 36-inch diameter storm drain during the construction of the northern and eastern portions of the Arcadia Park project. .[79, 80] The 2019 project would be required to comply with SCA-HYD-3: NPDES C.3 Stormwater Requirements for Regulated Projects (#53), which requires preparation and implementation of a Post-Construction Stormwater

[78] Regarding the estimated future sanitary sewer flows, the analysis utilized a service population of 1,064 which was determined based on the forecasted population of residents and employees, as described in *Section F, Greenhouse Gas Emissions and Climate Change*. A standard measure of waste water generation is 100 gallons per person per day. Based on these estimates a total of 106,400 gallons per day (gpd) would be produced at the site, which is equal to 0.164 cubic feet per second (cfs). Using a peak factor of 2, this equals 0.328 cfs.

[79] Dara O'Byrne, 2019. E-mail from Dara O'Byrne of the City of Oakland to Emilie Wolfson of Urban Planning Partners, September 30.

[80] Civil Engineering Associates. 2007. As-Built Utility Plans, 92nd Avenue, April 20, updated September 5.

Management Plan that must include and identify the location and size of new and replaced impervious surface; directional surface flow of stormwater runoff; location of proposed on-site storm drain lines; site design measures to reduce the amount of impervious surface area; source control measures to limit stormwater pollution; and stormwater treatment measures to remove pollutants from stormwater runoff, including the method used to hydraulically size the treatment measures. Compliance with SCA-HYD-3 and the City's review of the Post-Construction Stormwater Management Plan would ensure that appropriate stormwater controls are incorporated into the project design to ensure that changes in drainage patterns and stormwater runoff from the project would have less-than-significant impacts.

Though the 2019 project is proposing more density and intensity (a net increase of 201 units compared to what was analyzed in the Arcadia Park EIR, and approximately 14,156 square feet of commercial square footage (including the 9 work/live units), these changes would not result in a new significant impact or substantially increase in severity of any previously identified significant impacts as the 2019 project does not trigger any significant impacts based on the City's significance criteria.

Potable water is available for both domestic and fire protection from existing facilities, (e.g. reservoirs, pumping stations), which are services that are maintained by the East Bay Municipal Utilities District (EBMUD).[81] As described in the 2015-2023 City of Oakland Housing Element, EBMUD has sufficient water supply to meet customer service demands through the year 2030 (based on Association of Bay Area Government's population projection), although a Drought Management Program would be required during dry years.[82]

The City's standard construction practices would ensure that any impacts related to water, wastewater, and stormwater would be mitigated to less-than-significant levels. These practices include SCA-UTIL-5: Sanitary Sewer System (#86), SCA-UTIL-6: Storm Drain System (#87), SCA-UTIL-7: Recycled Water (#88), SCA-UTIL-8: Water Efficient Landscape Ordinance (WELO) (#89), SCA-HYD-1: Erosion and Sedimentation Control Plan for Construction (#47), and SCA-HYD-3: NPDES C.3 Stormwater Requirements for Regulated Projects (#53). Wastewater generated by the 2019 project would be subject to both primary and secondary treatment and would not violate the wastewater treatment requirements of the San Francisco Bay RWQCB.

Solid Waste Services (Criterion 14c)

As described in the Arcadia Park EIR, all development would be designed in accordance with State and local solid waste regulations such that impacts associated with solid waste

[81] East Bay Municipal Utility District, Correspondence with Kari Walters on November 16, 2018.
[82] City of Oakland (2014). City of Oakland Housing Element 2015-2023, page 247. Adopted December 9, 2014.

would be less than significant. Non-hazardous solid waste in the analyzed area is ultimately hauled to the Altamont Landfill and Resource Facility. The Altamont Landfill would have sufficient capacity to accept waste generated by development under the project[83]. In addition, implementation of SCA-UTIL-1: Construction and Demolition Waste Reduction and Recycling (#81) and SCA-UTIL-2: Recycling Collection and Storage Space (#83), pertain to waste reduction and recycling collection. Implementation of these SCAs would ensure no significant impacts related to solid waste would occur.

Energy (Criterion 14d)

Development under the 2019 project, as addressed in the Arcadia Park EIR, would result in less-than-significant impacts related to energy standards and use. The 2019 project would be required to comply with the standards of Title 24 of the California Code of Regulations. The implementation of SCA-UTIL-2: Underground Utilities (#82) requires all projects to relocate all new gas, electric, cable, and telephone facilities underground. SCA-UTIL-4: Green Building Requirements (#84) requires compliance with the City's green building ordinance.

Conclusion

The Arcadia Park EIR analyzed 366 residential units with no commercial square footage. As of 2019, there are a total of 168 residential units that have been built, and the 2019 project includes 399 units, which is a net change of an additional 201 units. In addition, the project proposes approximately 14,000 square feet of commercial space (including the work/live area). While the project does represent a modification from the development envelope result in more demand for water, stormwater, and wastewater the demand would not substantially increase the severity of previously identified impact to utilities. Therefore, consistent with the findings of the Arcadia Park EIR, the 2019 project would not result in any significant impacts related to utilities and service systems. Further, based on an examination of the analysis, findings, and conclusions of the Previous CEQA Documents, implementation of the 2019 project would not substantially increase the severity of significant impacts identified in the Previous CEQA Documents. Nor would it result in new significant impacts related to utilities and service systems that were not identified in the Previous CEQA Documents. The Program EIRs did not identify any mitigation measures related to utilities and service systems, and none would be required for the project. Implementation of SCA-UTIL-1: Construction and Demolition Waste Reduction and Recycling (#81), SCA-UTIL-2: Underground Utilities (#82), SCA-UTIL-3: Recycling Collection and Storage Space (#83), SCA-UTIL-4: Green Building Requirements (#84), SCA-UTIL-5: Sanitary Sewer System (#86), SCA-UTIL-6: Storm Drain System (#87), SCA-UTIL-7: Recycled Water (#88), SCA-UTIL-8: Water Efficient Landscape Ordinance

[83] Alameda County Waste Management Authority, 2017. *Alameda County Integrated Waste Management Plan*, as amended March 22, 2017, page II-42.

(WELO) (#89) SCA-HYD-1: Erosion and Sedimentation Control Plan for Construction (#47), and SCA-HYD-3:NPDES C.3 Stormwater Requirements for Regulated Projects (#52) as well as compliance with Title 24 and CALGreen requirements would ensure that impacts to sewer capacity, stormwater drainage facilities, solid waste services, and energy would be less than significant.

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ATTACHMENT A: STANDARD CONDITIONS OF APPROVAL AND MITIGATION MONITORING AND REPORTING PROGRAM

A. Applicable Mitigation Measures

The following applicable mitigation measures from the 1998 LUTE EIR, Arcadia Park EIR, and 2010 Housing Element EIR, and 2014 Addendum would be required of the 2019 project to ensure that any impacts to the environment are to remain to the maximum extent feasible. All other mitigations which are functionally equivalent to the City of Oakland's Standard Conditions of Approval are discussed are addressed below in the Standard Conditions of Approval table.

Standard Conditions of Approval

The City of Oakland's Uniformly Applied Development Standards adopted as Standard Conditions of Approval (Standard Conditions of Approval, or SCAs) were originally adopted by the City in 2008 (Ordinance No. 12899 C.M.S.) pursuant to Public Resources Code section 21083.3) and have been incrementally updated over time. The SCAs incorporate development policies and standards from various adopted plans, policies, and ordinances (such as the Oakland Planning and Municipal Codes, Oakland Creek Protection, Stormwater Water Management and Discharge Control Ordinance, Oakland Tree Protection Ordinance, Oakland Grading Regulations, National Pollutant Discharge Elimination System (NPDES) permit requirements, Housing Element-related mitigation measures, Green Building Ordinance, historic/Landmark status, California Building Code, and Uniform Fire Code, among others), which have been found to substantially mitigate environmental effects.

These SCAs are incorporated into projects as conditions of approval, regardless of the determination of a project's environmental impacts. As applicable, the SCAs are adopted as requirements of an individual project when it is approved by the City, and are designed to, and will, avoid or substantially reduce a project's environmental effects.

In reviewing project applications, the City of Oakland determines which SCAs apply based upon the zoning district, community plan, and the type of permits/approvals required for the project. The City of Oakland also will determine which SCAs apply to a specific project based on the specific project type and/or project site characteristics. Because these SCAs are mandatory City requirements imposed on a city-wide basis, environmental analyses assume these SCAs will be implemented by the project, and these SCAs are not imposed as mitigation measures under CEQA.

All SCAs identified in the CEQA document—which are consistent with the measures and conditions presented in the 1998 LUTE EIR, Arcadia Park EIR, and 2010 Housing Element

EIR and 2014 Addendum—are included herein. To the extent that any SCA identified in the CEQA document was inadvertently omitted, it is automatically incorporated herein by reference.

- The first column identifies the SCA applicable to that topic in the CEQA document.
- The second column identifies the monitoring schedule or timing applicable to the project.
- The third column names the party responsible for monitoring the required action for the project.

In addition to the SCAs identified and discussed in the CEQA document, other SCAs that are applicable to the project are included herein.

The project sponsor is responsible for compliance with any recommendations in approved technical reports and with all SCAs set forth herein at its sole cost and expense, unless otherwise expressly provided in a specific SCA, and subject to the review and approval of the City of Oakland. Overall monitoring and compliance with the SCAs will be the responsibility of the Planning and Zoning Division. Prior to the issuance of a demolition, grading, and/or construction permit, the project sponsor shall pay the applicable mitigation and monitoring fee to the City in accordance with the City's Master Fee Schedule.

Note that the SCAs included in this document are referred to using an abbreviation for the environmental topic area and are numbered sequentially for each topic area—i.e., **SCA-AIR-1**, **SCA-AIR-2**, etc. The SCA titles are also provided—i.e., **SCA-AIR-1: Dust Controls – Construction Related (#21).**

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
Aesthetics, Shadow, and Wind			
SCA-AES-1: *Trash and Blight Removal (#16)*. The project applicant and his/her successors shall maintain the property free of blight, as defined in chapter 8.24 of the Oakland Municipal Code. For nonresidential and multi-family residential projects, the project applicant shall install and maintain trash receptacles near public entryways as needed to provide sufficient capacity for building users.	Ongoing	N/A	Bureau of Building
SCA-AES-2: *Graffiti Control (#17).* a. During construction and operation of the project, the project applicant shall incorporate best management practices reasonably related to the control of graffiti and/or the mitigation of the impacts of graffiti. Such best management practices may include, without limitation: i. Installation and maintenance of landscaping to discourage defacement of and/or protect likely graffiti-attracting surfaces. ii. Installation and maintenance of lighting to protect likely graffiti-attracting surfaces. iii. Use of paint with anti-graffiti coating. iv. Incorporation of architectural or design elements or features to discourage graffiti defacement in accordance with the principles of Crime Prevention Through Environmental Design (CPTED). v. Other practices approved by the City to deter, protect, or reduce the potential for graffiti defacement. b. The project applicant shall remove graffiti by appropriate means within seventy-two (72) hours. Appropriate means include the following: i. Removal through scrubbing, washing, sanding, and/or scraping (or similar method) without damaging the surface and without discharging wash water or cleaning detergents into the City storm drain system. ii. Covering with new paint to match the color of the surrounding surface. iii. Replacing with new surfacing (with City permits if required).	Ongoing	N/A	Bureau of Building
SCA-AES-3: *Landscape Plan (#18).* a. ***Landscape Plan Required*** The project applicant shall submit a final Landscape Plan for City review and approval that is consistent with the approved Landscape Plan. The Landscape Plan shall be included with the set of drawings submitted for the construction-related permit and shall comply with the landscape requirements of chapter 17.124 of the Planning Code. Proposed plants shall be predominantly drought-tolerant. Specification of any street trees shall comply with the	Prior to approval of construction-related permit	Bureau of Planning	N/A

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	**Initial Approval**	**Monitoring/ Inspection**
Master Street Tree List and Tree Planting Guidelines (which can be viewed at http://www2.oaklandnet.com/oakca1/groups/pwa/documents/report/oak042662.pdf and http://www2.oaklandnet.com/oakca1/groups/pwa/documents/form/oak025595.pdf, respectively), and with any applicable streetscape plan.			
b. Landscape Installation The project applicant shall implement the approved Landscape Plan unless a bond, cash deposit, letter of credit, or other equivalent instrument acceptable to the Director of City Planning, is provided. The financial instrument shall equal the greater of $2,500 or the estimated cost of implementing the Landscape Plan based on a licensed contractor's bid.	Prior to building permit final	Bureau of Planning	Bureau of Building
c. Landscape Maintenance All required planting shall be permanently maintained in good growing condition and, whenever necessary, replaced with new plant materials to ensure continued compliance with applicable landscaping requirements. The property owner shall be responsible for maintaining planting in adjacent public rights-of-way. All required fences, walls, and irrigation systems shall be permanently maintained in good condition and, whenever necessary, repaired or replaced.	Ongoing	N/A	Bureau of Buildings
SCA-AES-4: *Lighting (#19).* Proposed new exterior lighting fixtures shall be adequately shielded to a point below the light bulb and reflector to prevent unnecessary glare onto adjacent properties.	Prior to building permit final	N/A	Bureau of Building
SCA-AES-5: *Public Art for Private Development (#92).* The project is subject to the City's Public Art Requirements for Private Development, adopted by Ordinance No. 13275 C.M.S. ("Ordinance"). The public art contribution requirements are equivalent to one-half percent (0.5%) for the "residential" building development costs, and one percent (1.0%) for the "non-residential" building development costs. The contribution requirement can be met through 1) the installation of freely accessible art at the site; 2) the installation of freely accessible art within one-quarter mile of the site; or 3) satisfaction of alternative compliance methods described in the Ordinance, including, but not limited to, payment of an in-lieu fee contribution. The applicant shall provide proof of full payment of the in-lieu contribution and/or provide plans, for review and approval by the Planning Director, showing the installation or improvements required by the Ordinance prior to issuance of a building permit. Proof of installation of artwork, or other alternative requirement, is required prior to the City's issuance of a final certificate of occupancy for each phase of a project unless a separate, legal binding instrument is executed ensuring compliance within a timely manner subject to City approval.	Payment of in-lieu fees and/or plans showing fulfillment of public art requirement – Prior to Issuance of Building permit	Bureau of Planning	Bureau of Planning

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
Air Quality			
SCA-AIR-1: *Dust Controls – Construction Related (#20)*. The project applicant shall implement all of the following applicable dust control measures during construction of the project: a. Water all exposed surfaces of active construction areas at least twice daily. 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 feasible. 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. Limit vehicle speeds on unpaved roads to 15 miles per hour. e. All demolition activities (if any) shall be suspended when average wind speeds exceed 20 mph. f. All trucks and equipment, including tires, shall be washed off prior to leaving the site. g. 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. h. Apply and maintain vegetative ground cover (e.g., hydroseed) or non-toxic soil stabilizers to disturbed areas of soil that will be inactive for more than one month. Enclose, cover, water twice daily, or apply (non-toxic) soil stabilizers to exposed stockpiles (dirt, sand, etc.). i. 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. j. When working at a site, install appropriate wind breaks (e.g., trees, fences) on the windward side(s) of the site, to minimize wind-blown dust. Windbreaks must have a maximum 50 percent air porosity. k. Post a publicly visible large on-site sign that includes the contact name and phone number for the project complaint manager responsible for responding to dust complaints and the telephone numbers of the City's Code Enforcement unit and the Bay Area Air Quality Management District. When contacted, the project complaint manager shall respond and take corrective action within 48 hours. l. 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.	During construction	N/A	Bureau of Building

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
SCA-AIR-2: *Criteria Air Pollutants – Construction Related (#21)* The project applicant shall implement all of the following applicable basic control measures for criteria pollutants during construction of the project as applicable: a. 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 two minutes (as required by the California airborne toxics control measure Title 13, Section 2485, of the California Code of Regulations). Clean signage to this effect shall be provided for construction workers at all access points. b. Idling times on all diesel-fueled off-road vehicles over 25 horsepower shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to two minutes and fleet operators must develop a written policy as required by Title 23, Section 2449, of the California Code of Regulations ("California Air Resources Board Off-Road Diesel Regulations"). c. 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. Equipment check documentation should be kept at the construction site and be available for review by the City and the Bay Area Air Quality District as needed. d. Portable equipment shall be powered by grid electricity if available. If electricity is not available, propane or natural gas generators shall be used if feasible. Diesel engines shall only be used if grid electricity is not available and propane or natural gas generators cannot meet the electrical demand. e. Low VOC (i.e., ROG) coatings shall be used that comply with BAAQMD Regulation 8, Rule 3: Architectural Coatings. f. All equipment to be used on the construction site shall comply with the requirements of Title 13, Section 2449, of the California Code of Regulations ("California Air Resources Board Off-Road Diesel Regulations") and upon request by the City (and the Air District if specifically requested), the project applicant shall provide written documentation that fleet requirements have been met.	During construction	N/A	Bureau of Building
SCA-AIR-3: *Diesel Particulate Matter Controls – Construction Related (#22).* ***a. Diesel Particulate Matter Reduction Measures*** The project applicant shall implement appropriate measures during construction to reduce potential health risks to sensitive receptors due to exposure to diesel particulate matter (DPM) from construction emissions. The project applicant shall choose **one** of the following methods:	Prior to issuance of a construction-related permit	Bureau of Planning	Bureau of Building

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	When Required	Initial Approval	Monitoring/ Inspection
i. The project applicant shall retain a qualified air quality consultant to prepare a Health Risk Assessment (HRA) in accordance with current guidance from the California Air Resources Board (CARB) and Office of Environmental Health and Hazard Assessment to determine the health risk to sensitive receptors exposed to DPM from project construction emissions. The HRA shall be submitted to the City (and the Air District if specifically requested) for review and approval. If the HRA concludes that the health risk is at or below acceptable levels, then DPM reduction measures are not required. If the HRA concludes that the health risk exceeds acceptable levels, DPM reduction measures shall be identified to reduce the health risk to acceptable levels as set forth under subsection b below. Identified DPM reduction measures shall be submitted to the City for review and approval prior to the issuance of building permits and the approved DPM reduction measures shall be implemented during construction. -or- ii. All off-road diesel equipment shall be equipped with the most effective Verified Diesel Emission Control Strategies (VDECS) available for the engine type (Tier 4 engines automatically meet this requirement) as certified by CARB. The equipment shall be properly maintained and tuned in accordance with manufacturer specifications. This shall be verified through an equipment inventory submittal and Certification Statement that the Contractor agrees to compliance and acknowledges that a significant violation of this requirement shall constitute a material breach of contract. ***b. Construction Emissions Minimization Plan (if required by a above)*** The project applicant shall prepare a Construction Emissions Minimization Plan (Emissions Plan) for all identified DPM reduction measures (if any). The Emissions Plan shall be submitted to the City (and the Bay Area Air Quality District if specifically requested) for review and approval prior to the issuance of building permits. The Emissions Plan shall include the following: i. An equipment inventory summarizing the type of off-road equipment required for each phase of construction, including the equipment manufacturer, equipment identification number, engine model year, engine certification (tier rating), horsepower, and engine serial number. For all VDECS, the equipment inventory shall also include the technology type, serial number, make, model, manufacturer, CARB verification number level, and installation date. ii. A Certification Statement that the Contractor agrees to comply fully with the Emissions Plan and acknowledges that a significant violation of the Emissions Plan shall constitute a material breach of contract.			

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	When Required	Initial Approval	Monitoring/ Inspection
SCA-AIR-4: *Exposure to Air Pollution (Toxic Air Contaminants) (#23)* a. Health Risk Reduction Measures The project applicant shall incorporate appropriate measures into the project design in order to reduce the potential health risk due to on-site stationary sources of toxic air contaminants. The project applicant shall choose **one** of the following methods: i. The project applicant shall retain a qualified air quality consultant to prepare a Health Risk Assessment (HRA) in accordance with California Air Resources Board (CARB) and Office of Environmental Health and Hazard Assessment requirements to determine the health risk of exposure of project residents/occupants/users to air pollutants. The HRA shall be submitted to the City for review and approval. If the HRA concludes that the health risk is at or below acceptable levels, then health risk reduction measures are not required. If the HRA concludes that the health risk exceeds acceptable levels, health risk reduction measures shall be identified to reduce the health risk to acceptable levels. Identified risk reduction measures shall be submitted to the City for review and approval and be included on the project drawings submitted for the construction-related permit or on other documentation submitted to the City. The approved risk reduction measures shall be implemented during construction and/or operations as applicable. – or – ii. The project applicant shall incorporate the following health risk reduction measures into the project. These features shall be submitted to the City for review and approval and be included on the project drawings submitted for the construction-related permit or on other documentation submitted to the City: • Installation of air filtration to reduce cancer risks and Particulate Matter (PM) exposure for residents and other sensitive populations in the project that are in close proximity to sources of air pollution. Air filter devices shall be rated MERV-13 **[insert MERV-16 for projects located in the West Oakland Specific Plan area]** or higher. As part of implementing this measure, an ongoing maintenance plan for the building's HVAC air filtration system shall be required. • Where appropriate, install passive electrostatic filtering systems, especially those with low air velocities (i.e., 1 mph). • Phasing of residential developments when proposed within 500 feet of freeways such that homes nearest the freeway are built last, if feasible. • The project shall be designed to locate sensitive receptors as far away as feasible from the source(s) of air pollution. Operable windows, balconies, and building air intakes shall be located as far away from these sources as feasible. If near a distribution center, residents	Prior to approval of construction-related permit	Bureau of Planning	Bureau of Building

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	When Required	Initial Approval	Monitoring/ Inspection

shall be located as far away as feasible from a loading dock or where trucks concentrate to deliver goods.
• Sensitive receptors shall be located on the upper floors of buildings, if feasible.
• Planting trees and/or vegetation between sensitive receptors and pollution source, if feasible. Trees that are best suited to trapping PM shall be planted, including one or more of the following: Pine (*Pinus nigra* var. *maritima*), Cypress (*X Cupressocyparis leylandii*), Hybrid poplar (*Populus deltoids X trichocarpa*), and Redwood (*Sequoia sempervirens*).
• Sensitive receptors shall be located as far away from truck activity areas, such as loading docks and delivery areas, as feasible.
• Existing and new diesel generators shall meet CARB's Tier 4 emission standards, if feasible.
• Emissions from diesel trucks shall be reduced through implementing the following measures, if feasible:
  • Installing electrical hook-ups for diesel trucks at loading docks.
  • Requiring trucks to use Transportation Refrigeration Units (TRU) that meet Tier 4 emission standards.
  • Requiring truck-intensive projects to use advanced exhaust technology (e.g., hybrid) or alternative fuels.
  • Prohibiting trucks from idling for more than two minutes.
  • Establishing truck routes to avoid sensitive receptors in the project. A truck route program, along with truck calming, parking, and delivery restrictions, shall be implemented.
 	
b. Maintenance of Health Risk Reduction Measures
The project applicant shall maintain, repair, and/or replace installed health risk reduction measures, including but not limited to the HVAC system (if applicable), on an ongoing and as-needed basis. Prior to occupancy, the project applicant shall prepare and then distribute to the building manager/operator an operation and maintenance manual for the HVAC system and filter including the maintenance and replacement schedule for the filter.			

Biological Resources			
SCA-BIO-1: *Tree Removal during Bird Breeding Season (#29)*. To the extent feasible, removal of any tree and/or other vegetation suitable for nesting of birds shall not occur during the bird breeding season of February 1 to August 15 (or during December 15 to August 15 for trees located in or near marsh, wetland, or aquatic habitats). If tree removal must occur during the bird breeding season, all trees to be removed 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 the start of work and shall be submitted	Prior to removal of trees	Bureau of Planning	Bureau of Building

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
to the City for review and approval. If the survey indicates the potential presence 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 California Department of Fish and Wildlife, 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.			
SCA-BIO-2: *Tree Permit (#30).* ***a. Tree Permit Required*** Pursuant to the City's Tree Protection Ordinance (OMC chapter 12.36), the project applicant shall obtain a tree permit and abide by the conditions of that permit.	Prior to approval of construction-related permit	Permit approval by Public Works Department, Tree Division; evidence of approval submitted to Bureau of Building	Bureau of Building
b. Tree Protection During Construction Adequate protection shall be provided during the construction period for any trees which are to remain standing, including the following, plus any recommendations of an arborist: i.Before the start of any clearing, excavation, construction, or other work on the site, every protected tree deemed to be potentially endangered by said site work shall be securely fenced off at a distance from the base of the tree to be determined by the project's consulting arborist. Such fences shall remain in place for duration of all such work. All trees to be removed shall be clearly marked. A scheme shall be established for the removal and disposal of logs, brush, earth, and other debris which will avoid injury to any protected tree. ii.Where proposed development or other site work is to encroach upon the protected perimeter of any protected tree, special measures shall be incorporated to allow the roots to breathe and obtain water and nutrients. Any excavation, cutting, filling, or compaction of the existing ground surface within the protected perimeter shall be minimized. No change in existing ground level shall occur within a distance to be determined by the project's consulting arborist from the base of any protected tree at any time. No burning or use of equipment with an open flame shall occur near or within the protected perimeter of any protected tree.	During construction	Public Works Department, Tree Division	Bureau of Building

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	**Initial Approval**	**Monitoring/ Inspection**
iii.No storage or dumping of oil, gas, chemicals, or other substances that may be harmful to trees shall occur within the distance to be determined by the project's consulting arborist from the base of any protected trees, or any other location on the site from which such substances might enter the protected perimeter. No heavy construction equipment or construction materials shall be operated or stored within a distance from the base of any protected trees to be determined by the project's consulting arborist. Wires, ropes, or other devices shall not be attached to any protected tree, except as needed for support of the tree. No sign, other than a tag showing the botanical classification, shall be attached to any protected tree. iv.Periodically during construction, the leaves of protected trees shall be thoroughly sprayed with water to prevent buildup of dust and other pollution that would inhibit leaf transpiration. v. If any damage to a protected tree should occur during or as a result of work on the site, the project applicant shall immediately notify the Public Works Department and the project's consulting arborist shall make a recommendation to the City Tree Reviewer as to whether the damaged tree can be preserved. If, in the professional opinion of the Tree Reviewer, such tree cannot be preserved in a healthy state, the Tree Reviewer shall require replacement of any tree removed with another tree or trees on the same site deemed adequate by the Tree Reviewer to compensate for the loss of the tree that is removed. vi.All debris created as a result of any tree removal work shall be removed by the project applicant from the property within two weeks of debris creation, and such debris shall be properly disposed of by the project applicant in accordance with all applicable laws, ordinances, and regulations.			
c. Tree Replacement Plantings Replacement plantings shall be required for tree removals for the purposes of erosion control, groundwater replenishment, visual screening, wildlife habitat, and preventing excessive loss of shade, in accordance with the following criteria: 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. Replacement tree species shall consist of Sequoia sempervirens (Coast Redwood), Quercus agrifolia (Coast Live Oak), Arbutus menziesii (Madrone), Aesculus californica (California Buckeye), Umbellularia californica (California Bay Laurel), or other tree species acceptable to the Tree Division.	Prior to building permit final	Public Works Department, Tree Division	Bureau of Building

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
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Replacement trees shall be at least 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. Minimum planting areas must be available on site as follows: For Sequoia sempervirens, three hundred fifteen (315) square feet per tree; For other species listed, seven hundred (700) square feet per tree. In the event that replacement trees are required but cannot be planted due to site constraints, an in lieu fee in accordance with the City's Master Fee Schedule may be substituted for required replacement plantings, with all such revenues applied toward tree planting in city parks, streets, and medians. The project applicant shall install the plantings and maintain the plantings until established. The Tree Reviewer of the Tree Division of the Public Works Department may require a landscape plan showing the replacement plantings and the method of irrigation. Any replacement plantings which fail to become established within one year of planting shall be replanted at the project applicant's expense.			
Cultural Resources			
SCA-CUL-1: *Archaeological and Paleontological Resources – Discovery During Construction (#32)*. Pursuant to CEQA Guidelines section 15064.5(f), in the event that any historic or prehistoric subsurface cultural resources are discovered during ground disturbing activities, all work within 50 feet of the resources shall be halted and the project applicant shall notify the City and consult with a qualified archaeologist or paleontologist, as applicable, to assess the significance of the find. In the case of discovery of paleontological resources, the assessment shall be done in accordance with the Society of Vertebrate Paleontology standards. If any find is determined to be significant, appropriate avoidance measures recommended by the consultant and approved by the City must be followed unless avoidance is determined unnecessary or infeasible by the City. Feasibility of avoidance shall be determined with consideration 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, excavation) shall be instituted. Work may proceed on other parts of the project site while measures for the cultural resources are implemented. In the event of data recovery of archaeological resources, the project applicant shall submit an Archaeological Research Design and Treatment Plan (ARDTP) prepared by a qualified archaeologist for review and approval by the City. 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	During construction	N/A	Bureau of Building

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
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 project. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practicable. 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. The project applicant shall implement the ARDTP at his/her expense. In the event of excavation of paleontological resources, the project applicant shall submit an excavation plan prepared by a qualified paleontologist to the City for review and approval. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and/or a report prepared by a qualified paleontologist, as appropriate, according to current professional standards and at the expense of the project applicant.			
SCA-CUL-2: *Archaeologically Sensitive Areas – Pre-Construction Measures (#33).* The project applicant shall implement either Provision A (Intensive Pre-Construction Study) or Provision B (Construction ALERT Sheet) concerning archaeological resources. Provision A: Intensive Pre-Construction Study. ***Provision A: Intensive Pre-Construction Study*** The project applicant shall retain a qualified archaeologist to conduct a site-specific, intensive archaeological resources study for review and approval by the City 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. At a minimum, the study shall include: a. Subsurface presence/absence studies of the project site. Field studies may include, but are not limited to, auguring and other common methods used to identify the presence of archaeological resources. b. A report disseminating the results of this research. c. 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 and prepare an ALERT sheet pursuant to Provision B below that details what could potentially be found at the project site.	Provision A: Prior to approval of construction related permit. Provision B: During Construction	Provision A: Bureau of Building Provision B: Bureau of Planning	Bureau of Building

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
Archaeological monitoring would include briefing construction personnel about the type of artifacts that may be present (as referenced in the ALERT sheet, required per Provision B below) and the procedures to follow if any artifacts 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, and preparing a report to document negative findings after construction is completed if no archaeological resources are discovered during construction. ***Provision B: Construction ALERT Sheet*** The project applicant shall prepare a construction "ALERT" sheet developed by a qualified archaeologist for review and approval by the City prior to soil-disturbing activities occurring on the project site. The ALERT sheet shall contain, at a minimum, 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 utility firms 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, all work must stop and the City's Environmental Review Officer contacted in the event of discovery of the following cultural materials: 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. The ALERT sheet shall also be posted in a visible location at the project site.			
SCA-CUL-3: *Human Remains – Discovery During Construction (#34).* Pursuant to CEQA Guidelines section 15064.5(e)(1), in the event that human skeletal remains are uncovered at the project site during construction activities, all work shall immediately halt and the project applicant shall notify the City and the Alameda County Coroner. If the County Coroner determines that an investigation of the cause of death is required or that the remains are Native American, all work shall cease within 50 feet of the remains until appropriate	During construction	N/A	Bureau of Building

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
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arrangements are made. In the event 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 California Health and Safety Code. 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 and at the expense of the project applicant.			
Geology, Soils and Geohazards			
SCA-GEO-1: *Construction-Related Permit(s) (#36).* The project applicant shall obtain all required construction-related permits/approvals from the City. The project shall comply with all standards, requirements and conditions contained in construction-related codes, including but not limited to the Oakland Building Code and the Oakland Grading Regulations, to ensure structural integrity and safe construction.	Prior to approval of construction-related permit	Bureau of Building	Bureau of Building
SCA-GEO-2: *Seismic Hazards Zone (Landslide/Liquefaction) (#39).* : The project applicant shall submit a site-specific geotechnical report, consistent with California Geological Survey Special Publication 117 (as amended), prepared by a registered geotechnical engineer for City review and approval containing at a minimum a description of the geological and geotechnical conditions at the site, an evaluation of site-specific seismic hazards based on geological and geotechnical conditions, and recommended measures to reduce potential impacts related to liquefaction and/or slope stability hazards. The project applicant shall implement the recommendations contained in the approved report during project design and construction.	Prior to approval of construction-related permit	Bureau of Building	Bureau of Building
SCA-HYD-1: *Erosion and Sedimentation Control Plan for Construction (#47)* See **SCA-HYD-1** below.	See **SCA-HYD-1** below.	See **SCA-HYD-1** below.	See **SCA-HYD-1** below.
SCA-HYD-2: *State Construction General Permit (#49)* See **SCA-HYD-2** below.	See **SCA-HYD-2** below.	See **SCA-HYD-2** below.	See **SCA-HYD-2** below.
Greenhouse Gas and Climate Change			
SCA-GHG-1: *GHG Reduction Plan (#41).* ***a. Greenhouse Gas (GHG) Reduction Plan Required*** The project applicant shall retain a qualified air quality consultant to develop a Greenhouse Gas (GHG) Reduction Plan for City review and approval and 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 <u>at least one</u> of the Bay Area Quality Management District's (BAAQMD's) CEQA Thresholds of Significance (1,100 metric tons of CO_2e per year or 4.6 metric tons of	Prior to approval of construction-related permit	Bureau of Planning	N/A

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
CO_2e per year per service population) 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), and additional GHG reduction measures available to further reduce GHG emissions, and (c) 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. 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 (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 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 "carbon credits") as explained 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. As with preferred locations for the implementation of all GHG reductions measures, the preference for 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 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. 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.			

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
b. GHG Reduction Plan Implementation During Construction The project applicant shall implement the GHG Reduction Plan during construction of the project. For physical GHG reduction measures to be incorporated into the design of the project, the measures shall be implemented during construction. For physical GHG reduction measures to be incorporated into off-site projects, the project applicant shall obtain all necessary permits/approvals and the measures shall be included on drawings and submitted to the City Planning Director or his/her designee for review and approval. These off-site improvements shall be installed prior to completion of the subject project (or prior to completion of the project phase for phased projects). For GHG reduction measures involving the purchase of carbon credits, evidence of the payment/purchase shall be submitted to the City for review and approval prior to completion of the project (or prior to completion of the project phase, for phased projects).	During Construction	Bureau of Planning	Bureau of Building
c. GHG Reduction Plan Implementation After Construction The project applicant shall implement the GHG Reduction Plan after construction of the project (or at the completion of the project phase for phased projects). For operational GHG reduction measures to be incorporated into the project or off-site projects, the measures shall be implemented on an indefinite and ongoing basis. The project applicant 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. **Annual Report.** Implementation of the GHG reduction measures and related requirements shall be ensured through 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 shall prepare each year of the useful life of the project an Annual GHG Emissions Reduction Report ("Annual Report"), for review and approval by the City Planning Director or his/her designee. The Annual Report shall be submitted to an independent reviewer of the City's choosing, to be paid for by the project applicant. 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.	Ongoing	Bureau of Planning	Bureau of Planning

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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 2005 "business-as-usual" baseline GHG emissions, as confirmed by the City through an established monitoring program. Monitoring and reporting activities will continue at the City's discretion, as discussed below. **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 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 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 fails to submit a report at the times described above, or if the reports do not meet City requirements outlined above, the City may, in addition to its other remedies, (a) assess the project applicant 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 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. **Timeline Discretion and Summary.** The City 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.			
Hazards and Hazardous Materials			

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	**Initial Approval**	**Monitoring/ Inspection**
SCA-HAZ-1: *Hazardous Materials Related to Construction (#42)*. The project applicant shall ensure that Best Management Practices (BMPs) are implemented by the contractor during construction to minimize potential negative effects on groundwater, soils, and human health. These shall include, at a minimum, the following: a.Follow manufacture's recommendations for 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,Implement lead-safe work practices and comply with all local, regional, state, and federal requirements concerning lead (for more information refer to the Alameda County Lead Poisoning Prevention Program); and 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 project 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 notifying the City and applicable 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.	During construction	N/A	Bureau of Building
SCA-HAZ-2: *Hazardous Building Materials and Site Contamination (#43).* ***a. Hazardous Building Materials Assessment*** The project applicant shall submit a comprehensive assessment report to the Bureau of Building, signed by a qualified environmental professional, documenting the presence or lack thereof of asbestos-containing materials (ACMs), lead-based paint, polychlorinated biphenyls (PCBs), and any other building materials or stored materials classified as hazardous materials by State or federal law. If lead-based paint, ACMs, PCBs, or any other building materials or stored materials classified as hazardous materials are present, the project applicant shall submit specifications prepared and signed by a qualified environmental professional, for the stabilization and/or removal of the identified hazardous materials in accordance with all applicable laws and regulations. The project applicant shall implement the approved recommendations and submit to the City evidence of approval for	Prior to approval of demolition, grading, or building permits	Bureau of Building	Bureau of Building

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	When Required	Initial Approval	Monitoring/ Inspection
any proposed remedial action and required clearances by the applicable local, state, or federal regulatory agency.			
b. Environmental Site Assessment Required The project applicant shall submit a Phase I Environmental Site Assessment report, and Phase II Environmental Site Assessment report if warranted by the Phase I report, for the project site for review and approval by the City. The report(s) shall be prepared by a qualified environmental assessment professional and include recommendations for remedial action, as appropriate, for hazardous materials. The project applicant shall implement the approved recommendations and submit to the City evidence of approval for any proposed remedial action and required clearances by the applicable local, state, or federal regulatory agency.	Prior to approval of construction-related permit	Applicable regulatory agency with jurisdiction	Applicable regulatory agency with jurisdiction

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	When Required	Initial Approval	Monitoring/ Inspection
c.Health and Safety Plan Required The project applicant shall submit a Health and Safety Plan for the review and approval by the City in order to protect project construction workers from risks associated with hazardous materials. The project applicant shall implement the approved Plan.	Prior to approval of construction-related permit	Bureau of Building	Bureau of Building
d. Best Management Practices (BMPs) Required for Contaminated Sites The project applicant shall ensure that Best Management Practices (BMPs) are implemented by the contractor during construction to minimize potential soil and groundwater hazards. These shall include the following: Soil generated by construction activities shall be stockpiled on-site 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 requirements. Groundwater pumped from the subsurface shall be contained on-site 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. Engineering controls shall be utilized, which include impermeable barriers to prohibit groundwater and vapor intrusion into the building.	During construction	N/A	Bureau of Building
SCA-HAZ-3: *Fire Safety Phasing Plan (#45).* The project applicant shall submit a Fire Safety Phasing Plan for City review and approval, and shall implement the approved Plan. The Fire Safety Phasing Plan shall include all of the fire safety features and emergency vehicle access incorporated into each phase of the project and the schedule for implementation of the features.	Prior to approval of construction-related permit	Oakland Fire Department	Bureau of Building
Hydrology and Water Quality			
SCA-HYD-1: *Erosion and Sedimentation Control Plan for Construction (#48)* **a. Erosion and Sedimentation Control Plan Required** Requirement: The project applicant shall submit an Erosion and Sedimentation Control Plan to the City for review and approval. 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 and/or construction 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,	During construction-	N/A	Bureau of Building

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	When Required	Initial Approval	Monitoring/ Inspection
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 City. 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. **b. Erosion and Sedimentation Control During Construction** The project applicant shall implement the approved Erosion and Sedimentation Control Plan. No grading shall occur during the wet weather season (October 15 through April 15) unless specifically authorized in writing by the Bureau of Building.			
SCA-HYD-2: *State Construction General Permit (#49)* The project applicant shall comply with the requirements of the Construction General Permit issued by the State Water Resources Control Board (SWRCB). The project applicant shall submit a Notice of Intent (NOI), Stormwater Pollution Prevention Plan (SWPPP), and other required Permit Registration Documents to SWRCB. The project applicant shall submit evidence of compliance with Permit requirements to the City.	Prior to approval of construction-related permit	State Water Resources Control Board; evidence of compliance submitted to Bureau of Building	State Water Resources Control Board

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	When Required	Initial Approval	Monitoring/ Inspection
SCA-HYD-3: *NPDES C.3 Stormwater Requirements for Regulated Projects (#53)* **a. Post-Construction Stormwater Management Plan Required** The project applicant shall comply with the requirements of Provision C.3 of the Municipal Regional Stormwater Permit issued under the National Pollutant Discharge Elimination System (NPDES). The project applicant shall submit a Post-Construction Stormwater Management Plan to the City for review and approval with the project drawings submitted for site improvements, and shall implement the approved Plan during construction. The Post-Construction Stormwater Management Plan shall include and identify the following: i. Location and size of new and replaced impervious surface; ii. Directional surface flow of stormwater runoff; iii. Location of proposed on-site storm drain lines; iv. Site design measures to reduce the amount of impervious surface area; v. Source control measures to limit stormwater pollution; vi. Stormwater treatment measures to remove pollutants from stormwater runoff, including the method used to hydraulically size the treatment measures; and vii. Hydromodification management measures, if required by Provision C.3, so that post-project stormwater runoff flow and duration match pre-project runoff.	a. Prior to approval of construction-related permit	a. Bureau of Planning; Bureau of Building	a. Bureau of Building
b. Maintenance Agreement Required The project applicant shall enter into a maintenance agreement with the City, based on the Standard City of Oakland Stormwater Treatment Measures Maintenance Agreement, in accordance with Provision C.3, which provides, in part, for the following: i. The project 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 ii. 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 maintenance agreement shall be recorded at the County Recorder's Office at the applicant's expense.	Prior to building permit final	Bureau of Building	Bureau of Building

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	When Required	Initial Approval	Monitoring/ Inspection
Noise			
SCA-NOI-1: *Construction Days/Hours (#61).* The project applicant shall comply with the following restrictions concerning construction days and hours: a.Construction activities are limited to between 7:00 a.m. and 7:00 p.m. Monday through Friday, except that pier drilling 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. b. Construction activities are limited to between 9:00 a.m. and 5:00 p.m. on Saturday. In residential zones and within 300 feet of a residential zone, construction activities are allowed from 9:00 a.m. to 5:00 p.m. only within the interior of the building with the doors and windows closed. No pier drilling or other extreme noise generating activities greater than 90 dBA are allowed on Saturday. c. No construction is allowed on Sunday or federal holidays. 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. Any construction activity proposed outside of the above days and hours for special activities (such as concrete pouring which may require more continuous amounts of time) shall be evaluated on a case-by-case basis by the City, with criteria including the urgency/emergency nature of the work, the proximity of residential or other sensitive uses, and a consideration of nearby residents'/occupants' preferences. The project applicant shall notify property owners and occupants located within 300 feet at least 14 calendar days prior to construction activity proposed outside of the above days/hours. When submitting a request to the City to allow construction activity outside of the above days/hours, the project applicant shall submit information concerning the type and duration of proposed construction activity and the draft public notice for City review and approval prior to distribution of the public notice.	During construction	N/A	Bureau of Building
SCA-NOI-2: *Construction Noise (#62).* The project applicant shall implement noise reduction measures to reduce noise impacts due to construction. Noise reduction measures include, but are not limited to, the following: 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. 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 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	During construction	N/A	Bureau of Building

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	When Required	Initial Approval	Monitoring/ Inspection
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. Applicant shall use temporary power poles instead of generators where feasible. Stationary noise sources shall be located as far from adjacent properties as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the City to provide equivalent noise reduction. e. The noisiest phases of construction shall be limited to less than 10 days at a time. Exceptions may be allowed if the City determines an extension is necessary and all available noise reduction controls are implemented.			
SCA-NOI-3: *Extreme Construction Noise (#63).* ***a. Construction Noise Management Plan Required*** Prior to any extreme noise generating construction activities (e.g., pier drilling, pile driving and other activities generating greater than 90dBA), the project applicant shall submit a Construction Noise Management Plan prepared by a qualified acoustical consultant for City review and approval that contains a set of site-specific noise attenuation measures to further reduce construction impacts associated with extreme noise generating activities. The project applicant shall implement the approved Plan during construction. Potential attenuation measures include, but are not limited to, the following: i.Erect temporary plywood noise barriers around the construction site, particularly along on sites adjacent to residential buildings; ii. 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; iii. Utilize noise control blankets on the building structure as the building is erected to reduce noise emission from the site; iv.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 implement such measure if such measures are feasible and would noticeably reduce noise impacts; and v. Monitor the effectiveness of noise attenuation measures by taking noise measurements.	Prior to approval of construction-related permit	Bureau of Building	Bureau of Building
b. Public Notification Required The project applicant shall notify property owners and occupants located within 300 feet of the construction activities at least 14 calendar days prior to commencing extreme noise	During construction	Bureau of Building	Bureau of Building

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	**Initial Approval**	**Monitoring/ Inspection**
generating activities. Prior to providing the notice, the project applicant shall submit to the City for review and approval the proposed type and duration of extreme noise generating activities and the proposed public notice. The public notice shall provide the estimated start and end dates of the extreme noise generating activities and describe noise attenuation measures to be implemented.			
SCA-NOI-4: *Construction Noise Complaints (#65).* The project applicant shall submit to the City for review and approval a set of procedures for responding to and tracking complaints received pertaining to construction noise, and shall implement the procedures during construction. At a minimum, the procedures shall include: a. Designation of an on-site construction complaint and enforcement manager for the project; b. A large on-site sign near the public right-of-way containing permitted construction days/hours, complaint procedures, and phone numbers for the project complaint manager and City Code Enforcement unit; c. Protocols for receiving, responding to, and tracking received complaints; and d. Maintenance of a complaint log that records received complaints and how complaints were addressed, which shall be submitted to the City for review upon the City's request.	Prior to approval of construction-related permit	Bureau of Building	Bureau of Building
SCA-NOI-5: *Exposure to Community Noise (#66).* The project applicant shall submit a Noise Reduction Plan prepared by a qualified acoustical engineer for City review and approval that contains noise reduction measures (e.g., sound-rated window, wall, and door assemblies) to achieve an acceptable interior noise level in accordance with the land use compatibility guidelines of the Noise Element of the Oakland General Plan. The applicant shall implement the approved Plan during construction. To the maximum extent practicable, interior noise levels shall not exceed the following: a, 45 dBA: Residential activities, civic activities, hotels b. 50 dBA: Administrative offices; group assembly activities c. 55 dBA: Commercial activities d. 65 dBA: Industrial activities	Prior to approval of construction-related permit	Bureau of Planning	Bureau of Building
SCA-NOI-6: *Operational Noise (#67).* Noise levels from the project site after completion of the project (i.e., during project operation) shall comply with the performance standards of chapter 17.120 of the Oakland Planning Code and chapter 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 City.	Ongoing	N/A	Bureau of Building

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	When Required	Initial Approval	Monitoring/ Inspection
SCA-NOI-9: *Exposure to Vibration (#68)* The project applicant shall submit a Vibration Reduction Plan prepared by a qualified acoustical consultant for City review and approval that contains vibration reduction measures to reduce groundborne vibration to acceptable levels per Federal Transit Administration (FTA) standards. The applicant shall implement the approved Plan during construction. Potential vibration reduction measures include, but are not limited to, 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 groundborne vibration to the residences above. Trenching, which involves excavating soil between the railway 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).	Prior to approval of construction-related permit	Bureau of Planning	Bureau of Planning
Arcadia Park EIR Mitigation Measure NOISE-3: The project sponsor shall retain an acoustical engineer during design to review and provide input to reduce the potential of vibration amplification on upper floors of the residences. Typical recommendations would include minimizing long spans, increasing joist depths, stiffening the structure, etc. Prospective residents shall be made aware of the train line through a full disclosure statement. These recommendations on the final design would be subject to City review and approval.	Prior to approval of construction-related permit	Bureau of Planning	Bureau of Planning
Population and Housing			
SCA-POP-1: *Jobs/Housing Impact Fee (#70)* The project applicant shall comply with the requirements of the City of Oakland Jobs/Housing Impact Fee Ordinance (chapter 15.68 of the Oakland Municipal Code).	Prior to issuance of building permit; subsequent milestones pursuant to ordinance	Bureau of Building	N/A
SCA-POP-2: *Affordable Housing Impact Fee (#71)* The project applicant shall comply with the requirements of the City of Oakland Affordable Housing Impact Fee Ordinance (chapter 15.72 of the Oakland Municipal Code).	Prior to issuance of building permit; subsequent	Bureau of Building	N/A

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	milestones pursuant to ordinance		
Public Services, Parks, and Recreation			
SCA-PUB-1: *Capital Improvements Impact Fee (#72)* The project applicant shall comply with the requirements of the City of Oakland Capital Improvements Fee Ordinance (chapter 15.74 of the Oakland Municipal Code).	Prior to issuance of building permit	Bureau of Building	N/A
SCA-PUB-2: *Public Improvements (#11)* The project applicant shall obtain all necessary permits/approvals, such as encroachment permits, obstruction permits, curb/gutter/sidewalk permits, and public improvement ("p-job") permits from the City for work in the public right-of-way, including but not limited to, streets, curbs, gutters, sidewalks, utilities, and fire hydrants. Prior to any work in the public right-of-way, the applicant shall submit plans for review and approval by the Bureau of Planning, the Bureau of Building, and other City departments as required. Public improvements shall be designed and installed to the satisfaction of the City.	N/A	N/A	N/A
Transportation and Circulation			
SCA-TRANS-1: *Construction Activity in the Public Right-of-Way (#74).* ***a. Obstruction Permit Required*** The project applicant shall obtain an obstruction permit from the City prior to placing any temporary construction-related obstruction in the public right-of-way, including City streets, sidewalks, bicycle facilities, and bus stops.	Prior to Approval of Construction Related Permit	Department of Transportation	Department of Transportation
b. Traffic Control Plan Required In the event of obstructions to vehicle or bicycle travel lanes, bus stops, or sidewalks, the project applicant shall submit a Traffic Control Plan to the City for review and approval prior to obtaining an obstruction permit. The project applicant shall submit evidence of City approval of the Traffic Control Plan with the application for an obstruction permit. The Traffic Control Plan shall contain a set of comprehensive traffic control measures for auto, transit, bicycle, and pedestrian accommodations (or detours, if accommodations are not feasible), including detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes. The Traffic Control Plan shall be in conformance with the City's Supplemental Design Guidance for Accommodating Pedestrians, Bicyclists, and Bus Facilities in Construction Zones.	The project applicant shall implement the approved Plan during construction.	Department of Transportation	Department of Transportation
c. Repair of City Streets The project applicant shall repair any damage to the public right-of way, including streets and sidewalks, caused by project construction at his/her expense within one week of the	Prior to building permit final	N/A	Department of Transportation

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	When Required	Initial Approval	Monitoring/ Inspection
occurrence of the damage (or excessive wear), unless further damage/excessive wear may continue; in such case, repair shall occur prior to approval of the final inspection of the construction-related permit. All damage that is a threat to public health or safety shall be repaired immediately.			
SCA-TRANS-2: *Bicycle Parking (#75).* The project applicant shall comply with the City of Oakland Bicycle Parking Requirements (chapter 17.118 of the Oakland Planning Code). The project drawings submitted for construction-related permits shall demonstrate compliance with the requirements.	Prior to approval of construction related permit	Bureau of Planning	Bureau of Building
SCA-TRANS-3: *Transportation Improvements (#76)* The project applicant shall implement the recommended on- and off-site transportation-related improvements contained within the Transportation Impact Review for the project (e.g., signal timing adjustments, restriping, signalization, traffic control devices, roadway reconfigurations, transportation demand management measures, and transit, pedestrian, and bicyclist amenities). The project applicant is responsible for funding and installing the improvements, and shall obtain all necessary permits and approvals from the City and/or other applicable regulatory agencies such as, but not limited to, Caltrans (for improvements related to Caltrans facilities) and the California Public Utilities Commission (for improvements related to railroad crossings), prior to installing the improvements. To implement this measure for intersection modifications, the project applicant shall submit Plans, Specifications, and Estimates (PS&E) to the City for review and approval. All elements shall be designed to applicable City standards in effect at the time of construction and all new or upgraded signals shall include these enhancements as required by the City. All other facilities supporting vehicle travel and alternative modes through the intersection shall be brought up to both City standards and ADA standards (according to Federal and State Access Board guidelines) at the time of construction. Current City Standards call for, among other items, the elements listed below: a. 2070L Type Controller with cabinet accessory b. GPS communication (clock) c. Accessible pedestrian crosswalks according to Federal and State Access Board guidelines with signals (audible and tactile) d. Countdown pedestrian head module switch out e. City Standard ADA wheelchair ramps f. Video detection on existing (or new, if required) g. Mast arm poles, full activation (where applicable) h. Polara Push buttons (full activation) i. Bicycle detection (full activation)	Prior to building permit final or as otherwise specified	Bureau of Building; Department of Transportation	Bureau of Building

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j. Pull boxes k. Signal interconnect and communication with trenching (where applicable), or through existing conduit (where applicable), 600 feet maximum l. Conduit replacement contingency m. Fiber switch n. PTZ camera (where applicable) o. Transit Signal Priority (TSP) equipment consistent with other signals along corridor p. Signal timing plans for the signals in the coordination group q. Bi-directional curb ramps (where feasible, and if project is on a street corner) Upgrade ramps on receiving curb (where feasible, and if project is on a street corner)			
SCA-TRANS-4: *Transportation and Parking Demand Management (#77).* ***a. Transportation and Parking Demand Management (TDM) Plan Required*** The project applicant shall submit a Transportation and Parking Demand Management (TDM) Plan for review and approval by the City. The goals of the TDM Plan shall be the following: • Reduce vehicle traffic and parking demand generated by the project to the maximum extent practicable. • Achieve the following project vehicle trip reductions (VTR): • Projects generating 50-99 net new a.m. or p.m. peak hour vehicle trips: 10 percent VTR • Projects generating 100 or more net new a.m. or p.m. peak hour vehicle trips: 20 percent VTR • Increase pedestrian, bicycle, transit, and carpool/vanpool modes of travel. All four modes of travel shall be considered, as appropriate. • Enhance the City's transportation system, consistent with City policies and programs. The TDM Plan should include the following: • Baseline existing conditions of parking and curbside regulations within the surrounding neighborhood that could affect the effectiveness of TDM strategies, including inventory of parking spaces and occupancy if applicable. Proposed TDM strategies to achieve VTR goals (see below). • For employers with 100 or more employees at the subject site, the TDM Plan shall also comply with the requirements of Oakland Municipal Code Chapter 10.68 Employer-Based Trip Reduction Program.	Prior to approval of construction-related permit	Bureau of Planning	N/A

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The following TDM strategies **must** be incorporated into a TDM Plan based on a project location or other characteristics. When required, these mandatory strategies should be identified as a credit toward a project's VTR.			

Improvement	**Required by code or when…**
Bus boarding bulbs or islands	• A bus boarding bulb or island does not already exist and a bus stop is located along the project frontage; and/or • A bus stop along the project frontage serves a route with 15 minutes or better peak hour service and has a shared bus-bike lane curb
Bus shelter	• A stop with no shelter is located within the project frontage, or • The project is located within 0.10 miles of a flag stop with 25 or more boardings per day
Concrete bus pad	• A bus stop is located along the project frontage and a concrete bus pad does not already exist
Curb extensions or bulb-outs	• Identified as an improvement within site analysis
Implementation of a corridor-level bikeway improvement	• A buffered Class II or Class IV bikeway facility is in a local or county adopted plan within 0.10 miles of the project location; and • The project would generate 500 or more daily bicycle trips
Implementation of a corridor-level transit capital improvement	• A high-quality transit facility is in a local or county adopted plan within 0.25 miles of the project location; and • The project would generate 400 or more peak period transit trips
Installation of amenities such as lighting; pedestrian-oriented green infrastructure, trees, or other greening landscape; and trash receptacles per the Pedestrian Master Plan and any applicable streetscape plan.	• Always required
Installation of safety improvements identified in the Pedestrian Master Plan (such as crosswalk	• When improvements are identified in the Pedestrian Master Plan along project frontage or at an adjacent intersection

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striping, curb ramps, count down signals, bulb outs, etc.)				
In-street bicycle corral	• A project includes more than 10,000 square feet of ground floor retail, is located along a Tier 1 bikeway, and on-street vehicle parking is provided along the project frontages.			
Intersection improvements[a]	• Identified as an improvement within site analysis			
New sidewalk, curb ramps, curb and gutter meeting current City and ADA standards	• Always required			
No monthly permits and establish minimum price floor for public parking[b]	• If proposed parking ratio exceeds 1:1000 sf. (commercial)			
Parking garage is designed with retrofit capability	• Optional if proposed parking ratio exceeds 1:1.25 (residential) or 1:1000 sf. (commercial)			
Parking space reserved for car share	• If a project is providing parking and a project is located within downtown. One car share space reserved for buildings between 50 – 200 units, then one car share space per 200 units.			
Paving, lane striping or restriping (vehicle and bicycle), and signs to midpoint of street section	• Typically required			
Pedestrian crossing improvements	• Identified as an improvement within site analysis			
Pedestrian-supportive signal changes[c]	• Identified as an improvement within operations analysis			
Real-time transit information system	• A project frontage block includes a bus stop or BART station and is along a Tier 1 transit route with 2 or more routes or peak period frequency of 15 minutes or better			
Relocating bus stops to far side	• A project is located within 0.10 mile of any active bus stop that is currently near-side			
Signal upgrades[d]	• Project size exceeds 100 residential units, 80,000 sf. of retail, or 100,000 sf. of commercial; and • Project frontage abuts an intersection with signal infrastructure older than 15 years			
Transit queue jumps	• Identified as a needed improvement within operations analysis of a project with frontage along a Tier 1 transit			

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(continued table below)			

	route with 2 or more routes or peak period frequency of 15 minutes or better
Trenching and placement of conduit for providing traffic signal interconnect	• Project size exceeds 100 units, 80,000 sf. of retail, or 100,000 sf. of commercial; and • Project frontage block is identified for signal interconnect improvements as part of a planned ITS improvement; and • A major transit improvement is identified within operations analysis requiring traffic signal interconnect
Unbundled parking	• If proposed parking ratio exceeds 1:1.25 (residential)

Other TDM strategies to consider include, but are not limited to, the following:

- 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 the Bicycle Parking Ordinance (chapter 17.117 of the Oakland Planning Code), and shower and locker facilities in commercial developments that exceed the requirement.
- Construction of and/or access to bikeways per the Bicycle Master Plan; construction of priority bikeways, on-site signage, and bike lane striping.
- Installation of safety elements per the Pedestrian Master Plan (such as crosswalk 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.
- Installation of amenities such as lighting, street trees, and trash receptacles per the Pedestrian Master Plan, the Master Street Tree List and Tree Planting Guidelines (which can be viewed at http://www2.oaklandnet.com/oakca1/groups/pwa/documents/report/oak042662.pdf and http://www2.oaklandnet.com/oakca1/groups/pwa/documents/form/oak025595.pdf, respectively)and any applicable streetscape plan.
- Construction and development of transit stops/shelters, pedestrian access, way finding signage, and lighting around transit stops per transit agency plans or negotiated improvements.
- 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).

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
• Provision of a transit subsidy to employees or residents, determined by the project applicant and subject to review by the City, if employees or residents use transit or commute by other alternative modes. • Provision of an ongoing contribution to transit service to the area between the project and nearest mass transit station prioritized as follows: 1) Contribution to AC Transit bus service; 2) Contribution to an existing area shuttle service; and 3) Establishment of new shuttle service. The amount of contribution (for any of the above scenarios) would be based upon the cost of establishing new shuttle service (Scenario 3). • Guaranteed ride home program for employees, either through 511.org or through separate program. • Pre-tax commuter benefits (commuter checks) for employees. • 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. • On-site carpooling and/or vanpool program that includes preferential (discounted or free) parking for carpools and vanpools. • Distribution of information concerning alternative transportation options. • 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. • Parking management strategies including attendant/valet parking and shared parking spaces. • Requiring tenants to provide opportunities and the ability to work off-site. • 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). • 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, based on published research or guidelines where feasible. 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			

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
compliance report is required, as explained below, the TDM Plan shall also specify the topics to be addressed in the annual report.			
b. TDM Implementation – Physical Improvements For VTR strategies involving physical improvements, the project applicant shall obtain the necessary permits/approvals from the City and install the improvements prior to the completion of the project.	Prior to building permit final	Bureau of Building	Bureau of Building
c. TDM Implementation – Operational Strategies For projects that generate 100 or more net new a.m. or p.m. 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 achieved by the project during operation. 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.	Ongoing	Department of Transportation	Department of Transportation
SCA-TRANS-5: *Transportation Impact Fee (#78).* The project applicant shall comply with the requirements of the City of Oakland Transportation Impact Fee Ordinance (chapter 15.74 of the Oakland Municipal Code).	Prior to issuance of building permit	Bureau of Building	N/A
SCA-TRANS-6: *Railroad Crossings (#79).* The project applicant shall submit for the City review and approval a Diagnostic Review to evaluate potential impacts to at-grade railroad crossings resulting from project-related traffic. In general, the major types of impacts to consider are collisions between trains and vehicles, trains and pedestrians, and trains and bicyclists. The Diagnostic Review shall include specific traffic elements, such as roadway and rail description, accident history, traffic volumes (all modes, including pedestrian and bicyclist crossing movements), train volumes, vehicular speeds, train speeds, and existing rail and traffic control. Where the Diagnostic Review identifies potentially substantially dangerous crossing conditions at at-grade railroad crossings caused by the project, measures relative to the project's traffic contribution to the crossings shall by applied through project redesign and/or incorporation of the appropriate measures to reduce potential adverse impacts at the crossings. These measures may include, without limitation, the following:	Prior to approval of construction related permit	Bureau of Planning	Bureau of Building

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
a. Installation of grade separations at crossings, i.e., physically separating roads and railroad tracks by construction overpasses or underpasses b. Improvements to warning devices at existing highway rail crossings that are impacted by project traffic c. Installation of additional warning signage d. Improvements to traffic signaling at intersections adjacent to crossings, e.g., signal preemption e. Installation of median separation to prevent vehicles from driving around railroad crossing gates f. Where sound walls, landscaping, buildings, etc. would be installed near crossings, maintaining the visibility of warning devices and approaching trains g. Prohibition of parking within 100 feet of the crossing to improve the visibility of warning devices and approaching trains h. Construction of pull-out lanes for buses and vehicles transporting hazardous materials i. Installation of vandal-resistant fencing or walls to limit the access of pedestrians onto the railroad right-of way j. Elimination of driveways near crossings k. Increased enforcement of traffic laws at crossings l. Rail safety awareness programs to educate the public about the hazards of highway-rail grade crossings Any proposed improvements must be coordinated with California Public Utility Commission (CPUC) and affected railroads and all necessary permits/approvals obtained, including a GO 88-B Request (Authorization to Alter Highway Rail Crossings). The project applicant shall implement the approved measures during construction of the project.			
SCA-TRANS-7: *Plug-In Electric Vehicle (PEV) Charing Infrastructure (#80).* ***a. PEV-Ready Parking Spaces*** The applicant shall submit, for review and approval of the Building Official and the Zoning Manager, plans that show the location of parking spaces equipped with full electrical circuits designated for future PEV charging (i.e. "PEV-Ready) per the requirements of Chapter 15.04 of the Oakland Municipal Code. Building electrical plans shall indicate sufficient electrical capacity to supply the required PEV-Ready parking spaces	Prior to Issuance of Building Permit	Bureau of Building	Bureau of Building
b. PEV-Capable Parking Spaces The applicant shall submit, for review and approval of the Building Official, plans that show the locations of inaccessible conduit to supply PEV-capable parking spaces per the requirements of Chapter 15.04 of the Oakland Municipal Code. Building electrical plans	Prior to Issuance of Building Permit	Bureau of Building	Bureau of Building

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
shall indicate sufficient electrical capacity to supply the required PEV-capable parking spaces.			
Utilities and Service Systems			
SCA-UTIL-1: *Construction and Demolition Waste Reduction and Recycling (#81).* The project applicant shall comply with the City of Oakland Construction and Demolition Waste Reduction and Recycling Ordinance (Chapter 15.34 of the Oakland Municipal Code) by submitting a Construction and Demolition Waste Reduction and Recycling Plan (WRRP) for City review and approval, and shall implement the approved WRRP. Projects subject to these requirements include all new construction, renovations/alterations/modifications with construction values of $50,000 or more (except R-3 type construction), and all demolition (including soft demolition) except demolition of type R-3 construction. The WRRP must specify the methods by which the project will divert construction and demolition debris waste from landfill disposal in accordance with current City requirements. The WRRP may be submitted electronically at www.greenhalosystems.com or manually at the City's Green Building Resource Center. Current standards, FAQs, and forms are available on the City's website and in the Green Building Resource Center.	Prior to approval of construction-related permit	Public Works Department, Environmental Services Division	Public Works Department, Environmental Services Division
SCA-UTIL-2: *Underground Utilities (#82).* The project applicant shall place underground all new utilities serving the project and under the control of the project applicant and the City, including all new gas, electric, cable, and telephone facilities, fire alarm conduits, street light wiring, and other wiring, conduits, and similar facilities. The new facilities shall be placed underground along the project's street frontage and from the project structures to the point of service. Utilities under the control of other agencies, such as PG&E, shall be placed underground if feasible. All utilities shall be installed in accordance with standard specifications of the serving utilities.	During construction	N/A	Bureau of Building
SCA-UTIL-3: *Recycling Collection and Storage Space (#83).* The project applicant shall comply with the City of Oakland Recycling Space Allocation Ordinance (Chapter 17.118 of the Oakland Planning Code). The project drawings submitted for construction-related permits shall contain recycling collection and storage areas in compliance with the Ordinance. For residential projects, at least two (2) cubic feet of storage and collection space per residential unit is required, with a minimum of ten (10) cubic feet. For nonresidential projects, at least two (2) cubic feet of storage and collection space per 1,000 square feet of building floor area is required, with a minimum of ten (10) cubic feet.	Prior to approval of construction-related permit	Bureau of Planning	Bureau of Building
SCA-UTIL-4: *Green Building Requirements (#84)* **a. Compliance with Green Building Requirements During Plan-Check**	Prior to approval of construction-related permit	Bureau of Building	N/A

<table>
<tr><th rowspan="2">Standard Conditions of Approval/ Mitigation Measure</th><th colspan="3">Implementation/Monitoring</th></tr>
<tr><th>When Required</th><th>Initial Approval</th><th>Monitoring/ Inspection</th></tr>
<tr><td>The project applicant shall comply with the requirements of the California Green Building Standards (CALGreen) mandatory measures and the applicable requirements of the City of Oakland Green Building Ordinance (Chapter 18.02 of the Oakland Municipal Code).
i. The following information shall be submitted to the City for review and approval with the application for a building permit:
• Documentation showing compliance with Title 24 of the current version of the California Building Energy Efficiency Standards.
• Completed copy of the final green building checklist approved during the review of the Planning and Zoning permit.
• Copy of the Unreasonable Hardship Exemption, if granted, during the review of the Planning and Zoning permit.
• Permit plans that show, in general notes, detailed design drawings, and specifications as necessary, compliance with the items listed in subsection (ii) below.
• 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.
• 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.
• Other documentation as deemed necessary by the City to demonstrate compliance with the Green Building Ordinance.
ii. The set of plans in subsection (i) shall demonstrate compliance with the following:
• CALGreen mandatory measures.
• All pre-requisites per the green building 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.
• Minimum of 23 points per the appropriate checklist approved during the Planning entitlement process.
• 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 Bureau of Planning that shows the previously approved points that will be eliminated or substituted.
• The required green building point minimums in the appropriate credit categories.</td><td></td><td></td><td></td></tr>
<tr><td>b. Compliance with Green Building Requirements During Construction
The project applicant shall comply with the applicable requirements of CALGreen and the Oakland Green Building Ordinance during construction of the project.</td><td>During construction</td><td>N/A</td><td>Bureau of Building</td></tr>
</table>

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	Initial Approval	Monitoring/ Inspection
The following information shall be submitted to the City 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.			
c. Compliance with Green Building Requirements After Construction <u>Requirement</u>: Within sixty (60) days of the final inspection of the building permit for the project, the Green Building Certifier shall submit the appropriate e documentation to Build It Green and attain the minimum required certification/point level. Within one year of the final inspection of the building permit for the project, the applicant shall submit to the Bureau of Planning the Certificate from the organization listed above demonstrating certification and compliance with the minimum point/certification level noted above.	Prior to Final Approval	Bureau of Planning	Bureau of Building
SCA-UTIL-5: *Sanitary Sewer System (#86).* The project applicant shall prepare and submit a Sanitary Sewer Impact Analysis to the City for review and approval in accordance with the City of Oakland Sanitary Sewer Design Guidelines. The Impact Analysis shall include an estimate of pre-project and post-project wastewater flow from the project site. In the event that the Impact Analysis indicates that the net increase in project wastewater flow exceeds City-projected increases in wastewater flow in the sanitary sewer system, the project applicant shall pay the Sanitary Sewer Impact Fee in accordance with the City's Master Fee Schedule for funding improvements to the sanitary sewer system.	Prior to approval of construction-related permit	Public Works Department, Department of Engineering and Construction	N/A
SCA-UTIL-6: *Storm Drain System (#87).* The project storm drainage system shall be designed in accordance with the City of Oakland's Storm Drainage Design Guidelines. To the maximum extent practicable, peak stormwater runoff from the project site shall be reduced by at least 25 percent compared to the pre-project condition.	Prior to approval of construction-related permit	Bureau of Building	Bureau of Building
SCA-UTIL-7: *Recycled Water (#88).* Pursuant to section 16.08.030 of the Oakland Municipal Code, the project applicant shall provide for the use of recycled water in the project for feasible recycled water uses unless the City determines that there is a higher and better use for the recycled water, the use of recycled water is not economically justified for the project, or the use of recycled water is not financially or technically feasible for the project. . Feasible recycled water uses may include, but are not limited to, landscape irrigation,	Prior to approval of construction-related permit	Bureau of Planning; Bureau of Building	Bureau of Building

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<tr><th rowspan="2">Standard Conditions of Approval/ Mitigation Measure</th><th colspan="3">Implementation/Monitoring</th></tr>
<tr><th>When Required</th><th>Initial Approval</th><th>Monitoring/ Inspection</th></tr>
<tr><td>commercial and industrial process use, and toilet and urinal flushing in non-residential buildings. The project applicant shall contact the New Business Office of the East Bay Municipal Utility District (EBMUD) for a recycled water feasibility assessment by the Office of Water Recycling. If recycled water is to be provided in the project, the project drawings submitted for construction-related permits shall include the proposed recycled water system and the project applicant shall install the recycled water system during construction.</td><td></td><td></td><td></td></tr>
<tr><td>SCA-UTIL-8: Water Efficient Landscape Ordinance (WELO) (#89). The project applicant shall comply with California's Water Efficient Landscape Ordinance (WELO) in order to reduce landscape water usage. For the specific ordinance requirements, see the link below:
http://www.water.ca.gov/wateruseefficiency/landscapeordinance/docs/Title%2023%20extract%20-%20Official%20CCR%20pages.pdf . For any landscape project with an aggregate (total noncontiguous) landscape area equal to 2,500 sq. ft. or less, the project applicant may implement either the Prescriptive Measures or the Performance Measures, of, and in accordance with the California's Model Water Efficient Landscape Ordinance. For any landscape project with an aggregate (total noncontiguous) landscape area over 2,500 sq. ft., the project applicant shall implement the Performance Measures in accordance with the WELO.
Prescriptive Measures: Prior to construction, the project applicant shall submit the Project Information (detailed below) and documentation showing compliance with Appendix D of California's Model Water Efficient Landscape Ordinance (see page 38.14(g) in the link above23Performance Measures: Prior to construction, the project applicant shall prepare and submit a Landscape Documentation Package for review and approval, which includes the following
a. Project Information:
i. Date,
ii. Applicant and property owner name,
iii. Project address,
iv. Total landscape area,
v. Project type (new, rehabilitated, cemetery, or home owner installed),
vi. Water supply type and water purveyor,
vii. Checklist of documents in the package, and
viii. Project contacts
ix. Applicant signature and date with the statement: "I agree to comply with the requirements of the water efficient landscape ordinance and submit a complete Landscape Documentation Package."</td><td>Prior to approval of construction-related permit</td><td>Bureau of Planning</td><td>Bureau of Planning</td></tr>
</table>

Standard Conditions of Approval/ Mitigation Measure	Implementation/Monitoring		
	When Required	**Initial Approval**	**Monitoring/ Inspection**
b. Water Efficient Landscape Worksheet i. Hydrozone Information Table ii. Water Budget Calculations with Maximum Applied Water Allowance (MAWA) and Estimated Total Water Use c. Soil Management Report d. Landscape Design Plan e. Irrigation Design Plan, and f. Grading Plan Upon installation of the landscaping and irrigation systems, and prior to the final of a construction-related permit, the Project applicant shall submit a Certificate of Completion (see page 38.6 in the link above) and landscape and irrigation maintenance schedule for review and approval by the City. The Certificate of Completion shall also be submitted to the local water purveyor and property owner or his or her designee.			
SCA-HYD-1: Erosion and Sedimentation Control Plan for Construction (#47) See SCA-HYD-1.	See SCA-HYD-1.	See SCA-HYD-1.	See SCA-HYD-1.
SCA-HYD-3: NPDES C.3 Stormwater Requirements for Regulated Projects (#52) See SCA-HYD-3.	See SCA-HYD-3.	See SCA-HYD-3.	See SCA-HYD-3.

ATTACHMENT B: CRITERIA FOR USE OF ADDENDUM, PER CEQA GUIDELINES SECTIONS 15162, 15164, AND 15168

Section 15164(a) of the California Environmental Quality Act (CEQA) Guidelines states that "a lead agency or responsible agency shall prepare an addendum to a previously certified EIR [Environmental Impact Report] if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred." Section 15164(e) states that "a brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR."

As discussed in detail in *Chapter IV* of this document, the analysis in the Arcadia Park EIR is considered for this assessment under Sections 15162,15164, and 15168. The 1998 LUTE EIR, and 2010 Housing Element EIR and 2014 Addendum are Program EIRs considered for this assessment of an Addendum, pursuant to Section 15162,15164, and 15168.

Project

As discussed under project characteristics above, the project would introduce residential uses on the site previously considered by the Arcadia Park EIR. The changes on the 10.16-acre portion of the Arcadia Park site include an increase in residential density with 201 additional multi-family residential units, the elimination of single-family units, and the addition of 9 work/live units approximately (14,000, square feet of commercial split between the 9 units) introducing commercial uses to the project. These modifications would result in the site being developed as a mixed-use residential project, but the majority of the development would remain residential with just under 9 percent of the development being commercial work-live units. Although the projects are different, the prior CEQA analysis can be relied upon since the 2019 project revisions or changes under which the project would be undertaken or new information would not result in an increase in the severity of significant impacts, nor would they result in new significant impacts. The 2019 project therefore meets the requirements for an addendum.

In addition, as described in *Chapter IV, Summary of Findings*, the only significant and unavoidable impact for the Arcadia Park EIR was traffic and transportation. While the Arcadia Park EIR considered LOS, the 2019 project uses VMT a different threshold to measure transportation impacts.,

Conditions for Addendum

None of the following conditions for preparation of a subsequent EIR per Sections 15162(a) and 15168 apply to the project:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Project Consistency with Sections 15162 and 15168 of the CEQA Guidelines

Since certification of the Arcadia Park EIR, no changes have occurred in the circumstances under which the 2019 project would be implemented that would change the severity of the project's physical impacts, as explained in the CEQA Checklist in *Chapter V* of this document. No new information has emerged that would materially change the analyses or conclusions set forth in the Arcadia Park EIR.

Furthermore, as demonstrated in the CEQA Checklist, the 2019 project would not result in any new significant environmental impacts, result in any substantial increases in the significance of previously identified effects, or necessitate implementation of additional or considerably different mitigation measures than those identified in the Arcadia Park EIR, nor render any mitigation measures or alternatives found not to be feasible, feasible. The effects of the project would be substantially the same as those reported in the Arcadia Park EIR.

The analysis presented in this CEQA Checklist, combined with the prior Arcadia Park EIR's analysis, demonstrates that the 2019 project would not result in significant impacts that were not previously identified in the Arcadia Park EIR. The 2019 project would not result in a substantial increase in the significance of impacts, nor would it contribute considerably to cumulative effects that were not already accounted for in the certified Arcadia Park EIR and Program EIRs. Overall, the 2019 project's impacts are consistent with those identified and discussed in the Arcadia Park EIR and program EIRs, as described in the CEQA Checklist, and the findings reached in the Arcadia Park EIR and Program EIRs are applicable.

ATTACHMENT C: PROJECT CONSISTENCY WITH COMMUNITY PLAN OR ZONING, PER CEQA GUIDELINES SECTION 15183

Section 15183 (a) of the California Environmental Quality Act (CEQA) Guidelines states that "…projects which are consistent with the development density established by the existing zoning, community plan, or general plan policies for which an Environmental Impact Report (EIR) was certified shall not require additional environmental review, except as may be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site."

Project Characteristics

The 2019 project is on two parcels located at 921 98th Avenue and 999 98th Avenue within the Housing and Business Mix District (HBX) of the City of Oakland General Plan area. (35 feet to 60 feet) in height with a total of approximately 399 residential units, approximately 9 work/live units approximately (12,000 square feet of commercial split between the 9 units, approximately 2,468 square feet of commercial space, approximately 517 parking spaces, and approximately 37,000 square feet of Group Usable Open Space**.**

Project Consistency

The City of Oakland completed an update of the General Plan Land Use and Transportation Element (LUTE) in March 1998. The LUTE includes the City's current Land Use and Transportation Diagram as well as strategies, policies, and priorities for Oakland's development and enhancement during a two-decade period. The EIR certified for the LUTE is used to simplify the task of preparing environmental documents on later projects that occur as a result of LUTE implementation.

Criterion Section 15183(a): General Plan and Zoning Consistency

Section 15183(a) of the CEQA Guidelines states that "…projects which are consistent with the development density established by the existing zoning, community plan, or general plan policies for which an EIR was certified shall not require additional environmental review, except as may be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site."

As discussed in detail in *Chapter IV* of this document, the analysis in the 1998 LUTE EIR and the 2010 Housing Element EIR, and 2014 Addendum, are considered the qualified planning level CEQA documents for this assessment, pursuant to CEQA Guidelines Section 15183.

1998 General Plan Land Use and Transportation Element and EIR

As determined by the City of Oakland Bureau of Planning, the proposed land uses are permitted in the zoning district in which the project is located making the project consistent with the bulk, density, and land uses envisioned for the project site, as outlined below.

- The General Plan land use designation for the site is HBX. This classification is intended to guide a transition from heavy industry to low-impact light industrial and other businesses that con co-exist compatibly with residential development. Respect for environmental quality, coupled with opportunities for additional housing and neighborhood-friendly businesses is desired as well as the transition from industry that generates impacts detrimental to residences.
- The site is zoned Housing and Business Mix-1 Commercial Zone (HBX-1). The 2019 project would be consistent with the purposes of this district, which is generally intended to allow for mixed-use districts that recognize both residential and business activities and provide a transition between industrial areas and residential neighborhoods.
- The tallest building in the 2019 project would be five stories and 60 feet in height. Although the default height limit in the HBX-1 zone is 35 feet, Section 17.65.100.3(B) of the Oakland Municipal Code provides for 75-foot height limits in the HBX-1 zone on structures that are: 1) on lots adjacent to a Bay Area Rapid Transit (BART) right-of-way and 2) located within the closest 125 feet of a BART right-of-way. Most of the 2019 project's buildings fit both of these criteria. The remaining takes advantage of a PUD exemption as to height.

City of Oakland's 2015-2023 Housing Element

The project site was included in the list of Approved Projects in the City of Oakland's 2015-2023 Housing Element. The project site also meets the Housing Element's criteria of sites suitable for new housing development, including:

- It is an underutilized site with outmoded facilities and/or marginal existing use;
- It is infill development in close proximity to transit and at a higher density - but compatible with – the surrounding communities.
- It is located along one of the City's major commercial corridors, as encouraged by zoning and development guidelines, to maximize residents' access to services including retail opportunities, transportation alternatives and civic activities, while reducing the need for automobiles, thus increasing the sustainability of such development.

Conclusion

Cumulative environmental effects identified in the 1998 LUTE's EIR as significant unavoidable and significant, but which can be reduced to a less-than-significant level through mitigation, are limited to the following topics: aesthetics/winds, cultural resources, hazards/hazardous materials, land use/planning, population/housing, and public services. In accordance State CEQA Guidelines 15183, the project qualifies for a Community Plan Exemption because the following findings can be made:

- As demonstrated under Criterion Section 15183(a): General Plan and Zoning Consistency (above), the project is consistent with the development density established by existing zoning and General Plan policies for the site, and there are no peculiar aspects, other than those evaluated herein, that would increase the severity of any of the previously identified significant cumulative effects in the 1998 LUTE EIR.
- Since the 2019 project is consistent with the development assumptions for the site as provided under the 1998 LUTE EIR, and within the overall range of development area as assumed in the 2010 Housing Element EIR and 2014 Addendum, the 2019 project's potential contribution to cumulatively significant effects has already been addressed in these prior EIRs. Therefore, consistent with CEQA Guidelines Section 15183 which allows for streamlined environmental review, this document needs only to consider whether there are project-specific effects peculiar to the project or its site and relies on the streamlining provisions of CEQA Guidelines Section 15183 to not re-consider cumulative effects.

Therefore, the 2019 project is eligible for consideration of an exemption under California Public Resources Code Section 21083.3 and Section 15183 of the CEQA Guidelines.

ATTACHMENT D: INFILL PERFORMANCE STANDARDS, PER CEQA GUIDELINES SECTION 15183.3

The following information demonstrates that the project is eligible for permit streamlining pursuant to CEQA Guidelines Section 15183.3 as a qualified infill project.

Eligibility

The following analysis demonstrates that the 2019 project is located in an urban area on a site that has been previously developed; satisfies the performance standards provided in CEQA Guidelines Appendix M; and is consistent with the General Plan land use designation, density, building intensity and applicable policies. As such, this environmental review is limited to an assessment of whether the project may cause any project-specific effects and relies on uniformly applicable development policies or standards to substantially mitigate cumulative effects.

PROJECT INFILL ELIGIBILITY

CEQA Eligibility Criteria		Eligible?/Notes for Project
1.	Be located in an urban area on a site that either has been previously developed or that adjoins existing qualified urban uses on at least 75 percent of the site's perimeter. For the purpose of this subdivision, "adjoin" means the infill project is immediately adjacent to qualified urban uses, or is only separated from such uses by an improved right-of-way. (CEQA Guidelines Section 15183.3[b][1])	Yes. The project site has been previously developed as a yeast factory and adjoins existing urban uses, as described in the Project Description, above.
2.	Satisfy the performance Standards provided in Appendix M (CEQA Guidelines Section 15183.3[b][2]) as presented in 2a and 2b below:	
	2a. *Performance Standards Related to Project Design.* All projects must implement **all** of the following:	
	Renewable Energy. *Non-Residential Projects.* All nonresidential projects shall include on-site renewable power generation, such as solar photovoltaic, solar thermal, and wind power generation, or clean back-up power supplies, where feasible. *Residential Projects.* Residential projects are also encouraged to include such on-site renewable power generation.	Not Applicable. According to Section IV (G) of CEQA Appendix M, for mixed-use projects "…the performance standards in this section that apply to the predominant use shall govern the entire project." Because the predominant use is residential, the project is not required to include on-site renewable power generation.

PROJECT INFILL ELIGIBILITY

	CEQA Eligibility Criteria	Eligible?/Notes for Project
	Soil and Water Remediation. If the project site is included on any list compiled pursuant to Section 65962.5 of the Government Code, the project shall document how it has remediated the site if remediation is completed. Alternatively, the project shall implement the recommendations provided in a preliminary endangerment assessment or comparable document that identifies remediation appropriate for the site.	Yes. As stated in *Section V.G, Hazards and Hazardous Materials,* the project site is included on the list of hazardous materials release sites compiled pursuant to Section 65962.5 of the Government Code, and remediation of the project site activities was conducted in 2007. To mitigate potential human health risks associated with residual groundwater contamination, a deed restriction was recorded for the project site which (1) prohibits the installation of water wells, (2) requires the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) be notified if the project site is to be developed for sensitive uses (e.g., housing, schools, medical facilities), and (3) requires that a vapor barrier be installed beneath future buildings constructed in the areas of the former underground storage tanks (USTs). In March 2014, the Regional Water Board issued a "No Further Action" letter for the project site which confirmed the completion of investigation and remedial action. The 2019 project would be required to comply with SCA-HAZ-2, which requires the project applicant to implement remedial recommendations and submit to the City evidence of approval for any proposed remedial action and required clearances by the applicable local, State, or federal regulatory agency. In accordance with the requirements of SCA-HAZ-2 and the deed restriction for the project site, the project applicant must inform the Regional Water Board of the project, install vapor barriers beneath structures in the areas of the former USTs, and provide the City with evidence of approval from the Regional Water Board for the proposed residential use of the project site.
	Residential Units Near High-Volume Roadways and Stationary Sources. If a project includes residential units located within 500 feet, or other distance determined to be appropriate by the local agency or air district based on local conditions, of a high volume roadway or other significant sources of air pollution, the project shall comply with any policies and standards identified in the local general plan, specific plan, zoning code, or community risk reduction plan for the	Yes. For projects that include residential units, the BAAQMD recommends evaluating the cumulative health risks to the residents from mobile and stationary sources of TAC emissions within 1,000 feet of the project which is why we have included this distance in our response rather than 500 feet. Existing sources of TAC emissions within 1,000 feet of the project include six stationary sources and one major roadway.

PROJECT INFILL ELIGIBILITY

CEQA Eligibility Criteria		Eligible?/Notes for Project
	protection of public health from such sources of air pollution. If the local government has not adopted such plans or policies, the project shall include measures, such as enhanced air filtration and project design, that the lead agency finds, based on substantial evidence, will promote the protection of public health from sources of air pollution. Those measures may include, among others, the recommendations of the California Air Resources Board, air districts, and the California Air Pollution Control Officers Association.	Using the BAAQMD's Stationary Source Screening Analysis Tool and Roadway Screening Analysis Calculator, a health risk analysis was conducted and concluded that the cumulative excess cancer risk, chronic HI, and PM2.5 concentrations at the future maximally exposed individual resident would be less than the City's cumulative thresholds. Therefore, no significant impact related to the siting of sensitive uses adjacent to sources of pollution will result from the 2019 project. Additional health risk reduction measures would not be required.
	2b. *Additional Performance Standards by Project Type.* In addition to implementing all the features described in criterion 2a above, the project must meet eligibility requirements provided below by project type[a]	
	Residential. A residential project must meet **<u>one</u>** of the following: A. *Projects achieving below average regional per capita vehicle miles traveled.* A residential project is eligible if it is located in a "low vehicle travel area" within the region; B. *Projects located within ½-mile of an Existing Major Transit Stop or High Quality Transit Corridor.* A residential project is eligible if it is located within ½-mile of an existing major transit stop or an existing stop along a high quality transit corridor; **<u>or</u>** C. *Low – Income Housing.* A residential or mixed-use project consisting of 300 or fewer residential units all of which are affordable to low income households is eligible if the developer of the development project provides sufficient legal commitments to the lead agency to ensure the continued availability and use of the housing units for lower income households, as defined in Section 50079.5 of the Health and Safety Code, for a period of at least 30 years, at monthly housing costs, as determined pursuant to Section 50053 of the Health and Safety Code.	Yes, satisfies A. The project site is located in an area whose estimated vehicle miles traveled (VMT) per capita (for residential use) in the year 2020 is 11.55[1]. Per the City of Oakland's Transportation Impact Review Guidelines, issued April 14, 2017, an area is considered a "low vehicle travel area" if its VMT per capita is less than the existing regional household VMT per capita minus 15 percent. The estimated regional household VMT per capita for the year 2020 is 15 miles. Subtracting 15% from that figure results in 12.75. Since the 2019 project is located in an area whose VMT is lower than that of the existing regional household VMT minus 15%, the project satisfies criteria A.

[1] Metropolitan Transportation Commission, Simulated VMT per Capita by Place of Residence, Year 2020 Plan Bay Area, accessed on November 13,2018, https://mtc.maps.arcgis.com/apps/webappviewer/index.html?id=5dac76d69b3d41e583882e146491568b

PROJECT INFILL ELIGIBILITY

CEQA Eligibility Criteria		Eligible?/Notes for Project
	Commercial/Retail. A commercial/retail project must meet **one** of the following: A. *Regional Location.* A commercial project with no single-building floor-plate greater than 50,000 square feet is eligible if it locates in a "low vehicle travel area;" **or** B. *Proximity to Households.* A project with no single-building floor-plate greater than 50,000 square feet located within ½-mile of 1,800 households is eligible.	Not Applicable. According to Section IV (G) of CEQA Appendix M, for mixed-use projects "…the performance standards in this Section that apply to the predominant use shall govern the entire project." Because the predominant use is residential, the requirements for commercial/retail projects do not apply.
	Office Building. An office building project must meeting **one** of the following: A. *Regional Location.* Office buildings, both commercial and public, are eligible if they locate in a low vehicle travel area; **or** B. *Proximity to a Major Transit Stop.* Office buildings, both commercial and public, within ½-mile of an existing major transit stop, or ¼-mile of an existing stop along a high quality transit corridor, are eligible.	Not Applicable.
	Schools. Elementary schools within 1 mile of 50 percent of the projected student population are eligible. Middle schools and high schools within 2 miles of 50 percent of the projected student population are eligible. Alternatively, any school within ½-mile of an existing major transit stop or an existing stop along a high quality transit corridor is eligible. Additionally, to be eligible, all schools shall provide parking and storage for bicycles and scooters, and shall comply with the requirements of Sections 17213, 17213.1, and 17213.2 of the California Education Code.	Not Applicable.
	Transit. Transit stations, as defined in Section 15183.3(e)(1), are eligible.	Not Applicable.
	Small Walkable Community Projects. Small walkable community projects, as defined in Section 15183.3, subdivision (e)(6), that implement the project features in 2a above are eligible.	Not Applicable.
3.	Be consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy,	Yes. **(See explanation below table)**

PROJECT INFILL ELIGIBILITY

CEQA Eligibility Criteria		Eligible?/Notes for Project
	except as provided in CEQA Guidelines Sections 15183.3(b)(3)(A) or (b)(3)(B) below: (b)(3)(A). Only where an infill project is proposed within the boundaries of a metropolitan planning organization for which a sustainable communities strategy or an alternative planning strategy will be, but is not yet in effect, a residential infill project must have a density of at least 20 units per acre, and a retail or commercial infill project must have a floor area ratio of at least 0.75; **or** (b)(3)(B). Where an infill project is proposed outside of the boundaries of a metropolitan planning organization, the infill project must meet the definition of a "small walkable community project" in CEQA Guidelines Section 15183.3(f)(5). (CEQA Guidelines Section 15183.3[b][3])	

Explanation for Eligibility Criterion 3

The adopted Plan Bay Area (2017)[2] serves as the sustainable communities strategy for the Bay Area, per Senate Bill 375, under California Public Resource Codes Sections 21155, 21155.1, 21155.2, and 21159.28. As defined by Plan Bay Area, Priority Development Areas (PDAs) are areas where new development will support the needs of residents and workers in a pedestrian-friendly environment served by transit. According to Plan Bay Area, the project site and surrounding area north from 85th Avenue, east from E Street, south from the San Leandro Creek and west from Kerwin Avenue is considered a priority development area.[3] The 2019 project is consistent with the general land use designation, density, building intensity, and applicable policies specified in the General Plan as described in further detail the CEQA Analysis under Criterion 15183.3(a) and summarized below.

The General Plan land use designation for the project site is Housing and Business Mix; this classification is intended to encourage, support, and enhance the downtown area as a high-density mixed-use urban center of regional importance, and a primary hub for business, communications, office, government, high technology, retail, entertainment,

[2] Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG), 2017. Plan Bay Area, Strategy for a Sustainable Region. Adopted July 26, 2017.

[3] Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG), 2017. Plan Bay Area, Strategy for a Sustainable Region. Adopted July 26, 2017, Priority Development Area and Transit Priority Area Map for CEQA, accessed on November 13, 2018, https://www.planbayarea.org/pda-tpa-map

and transportation. The residential, work/live, and commercial uses proposed in the project would be consistent with this designation.

The site is zoned HBX-1 which allows for residential and commercial uses. The HBX-1 zoning designation allows for residential uses at a maximum density of 1,000 square-feet of lot area per residential unit. With a PUD approval the project is allowed a 25 percent increase up to the General Plan Maximum. The 25 percent PUD bonus allows 423 total units, which would accommodate the proposed residential use. The PUD permitting process allows projects to wavier or modify certain zoning standards, such as use, density, and height, in exchange for adherence to a comprehensive development plan, dedication of open space, and construction of key infrastructure. As discussed in *Chapter V, CEQA Checklist, Section I. Land Use*, although Parcels A, B, and C exceed the 35-foot height limit in the HBX-1 zone, they are located within 125 feet of the BART right-of-way and are thus eligible for the 75-foot height limit. Although Parcel D exceeds the 35-foot height limit and is over 125 feet from the BART right-of-way, height limits may be waived or modified as part of the PUD permitting process.[4]

Consistent with CEQA Guidelines Section 15183.3(b) which allows streamlining for qualified infill projects, this environmental document is limited to topics applicable to project-level review only. Cumulative level effects of infill development have been addressed in other planning level decisions of the Previous CEQA Documents, or by uniformly applicable development policies (SCAs) which mitigate such impacts.

Based on the streamlining provisions of CEQA Guidelines Sections 15183 and 15183.3, the project's cumulative effect would be less than significant, and an exception under CEQA Guidelines Section 15300.2(c) regarding cumulative effects does not apply to the 2019 project.

[4] City of Oakland Planning Code Section 17.142.100(G)

ATTACHMENT E. AIR QUALITY AND HEALTH RISK SCREENING ANALYSIS; CalEEMod

Madison Park.v1
Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	19.00	1000sqft	0.00	19,000.00	0
Parking Lot	519.00	Space	0.00	207,600.00	0
High Turnover (Sit Down Restaurant)	2.50	1000sqft	0.00	2,500.00	0
Apartments Mid Rise	230.00	Dwelling Unit	0.00	304,362.00	573
Apartments Mid Rise	52.00	Dwelling Unit	0.00	29,318.00	129
Condo/Townhouse	122.00	Dwelling Unit	10.16	220,687.00	304
Regional Shopping Center	19.00	1000sqft	0.00	19,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	294	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E's most recent (2016) CO2 Intensity Factor value verified by a thrid party.

Land Use - information based on the Preliminary Transportation Assessment and Madison Park Data Sheet.

Demolition - Former pavement and foundations: (10 acres)*(0.3 ft)*(0.0725 tons/ft^3) = about 10,000 tons

Grading - Assuming 8 acres would be covered by buildings with excavation up to 5 feet deep.

Vehicle Trips - Based on the updated trip generation sent on May 31, 2019

Woodstoves - Assume no woodstoves. Assume all fireplaces are gas-based.

Water And Wastewater - EBMUD would service the proposed project and applies 100 percent aerobic process and 100 percent cogeneration.

Construction Off-road Equipment Mitigation - The project applicant is committed to implement Tier 4 engines if they are availabe.

Water Mitigation - CalGreen Code requires indoor water use to be reduced by 20%.

Construction Phase -

Fleet Mix -

Energy Use -

Table Name	Column Name	Default Value	New Value
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblFireplaces	NumberWood	47.94	0.00
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tblLandUse	LandUseSquareFeet	52,000.00	29,318.00
tblLandUse	LandUseSquareFeet	122,000.00	220,687.00
tblLandUse	LotAcreage	0.44	0.00
tblLandUse	LotAcreage	4.67	0.00
tblLandUse	LotAcreage	0.06	0.00
tblLandUse	LotAcreage	6.05	0.00

tblLandUse	LotAcreage	1.37	0.00
tblLandUse	LotAcreage	7.63	10.16
tblLandUse	LotAcreage	0.44	0.00
tblLandUse	Population	658.00	573.00
tblLandUse	Population	149.00	129.00
tblLandUse	Population	349.00	304.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	294
tblVehicleTrips	ST_TR	6.39	4.01
tblVehicleTrips	ST_TR	5.67	5.41
tblVehicleTrips	ST_TR	2.46	1.62
tblVehicleTrips	ST_TR	158.37	107.28
tblVehicleTrips	ST_TR	49.97	34.10
tblVehicleTrips	SU_TR	5.86	3.68
tblVehicleTrips	SU_TR	4.84	4.62
tblVehicleTrips	SU_TR	1.05	0.69
tblVehicleTrips	SU_TR	131.84	89.30
tblVehicleTrips	SU_TR	25.24	17.23
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tblWater	AerobicPercent	87.46	100.00
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tblWater	AerobicPercent	87.46	100.00

tblWater	AerobicPercent	87.46	100.00
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tblWater	SepticTankPercent	10.33	0.00
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tblWoodstoves	NumberCatalytic	2.44	0.00

tblWoodstoves	NumberNoncatalytic	5.64	0.00
tblWoodstoves	NumberNoncatalytic	2.44	0.00

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					
2020	0.5433	5.6632	4.0022	0.0133	0.7805	0.1841	0.9646	0.2419	0.1721	0.4140	0.0000	1,221.0339	1,221.0339	0.1362	0.0000	1,224.4400
2021	4.3417	1.4846	1.5490	4.2100e-003	0.1859	0.0567	0.2426	0.0501	0.0532	0.1033	0.0000	380.2045	380.2045	0.0432	0.0000	381.2848
Maximum	**4.3417**	**5.6632**	**4.0022**	**0.0133**	**0.7805**	**0.1841**	**0.9646**	**0.2419**	**0.1721**	**0.4140**	**0.0000**	**1,221.0339**	**1,221.0339**	**0.1362**	**0.0000**	**1,224.4400**

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					
2020	0.2604	2.7336	4.0916	0.0133	0.7805	0.0176	0.7982	0.2419	0.0171	0.2590	0.0000	1,221.0335	1,221.0335	0.1362	0.0000	1,224.4396
2021	4.2530	0.6089	1.6189	4.2100e-003	0.1859	4.4000e-003	0.1903	0.0501	4.2700e-003	0.0544	0.0000	380.2043	380.2043	0.0432	0.0000	381.2847
Maximum	**4.2530**	**2.7336**	**4.0916**	**0.0133**	**0.7805**	**0.0176**	**0.7982**	**0.2419**	**0.0171**	**0.2590**	**0.0000**	**1,221.0335**	**1,221.0335**	**0.1362**	**0.0000**	**1,224.4396**

	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**	**N20**	**CO2e**
Percent Reduction	**7.61**	**53.24**	**-2.87**	**0.00**	**0.00**	**90.85**	**18.12**	**0.00**	**90.52**	**39.43**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2020	3-31-2020	2.8788	1.5126
2	4-1-2020	6-30-2020	1.0948	0.4857
3	7-1-2020	9-30-2020	1.1069	0.4910
4	10-1-2020	12-31-2020	1.1196	0.5037
5	1-1-2021	3-31-2021	0.9938	0.4548
6	4-1-2021	6-30-2021	2.9055	2.4827
7	7-1-2021	9-30-2021	1.9400	1.9327
		Highest	2.9055	2.4827

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	2.8467	0.0584	3.0215	3.1000e-004		0.0185	0.0185		0.0185	0.0185	0.0000	32.2498	32.2498	5.3000e-003	5.0000e-004	32.5317
Energy	0.0329	0.2840	0.1386	1.8000e-003		0.0228	0.0228		0.0228	0.0228	0.0000	643.6146	643.6146	0.0376	0.0125	648.2668
Mobile	0.7497	4.8680	7.9479	0.0282	2.1039	0.0279	2.1319	0.5656	0.0263	0.5918	0.0000	2,594.6734	2,594.6734	0.1189	0.0000	2,597.6457
Waste						0.0000	0.0000		0.0000	0.0000	51.3993	0.0000	51.3993	3.0376	0.0000	127.3397
Water						0.0000	0.0000		0.0000	0.0000	11.2740	29.9887	41.2627	0.0418	0.0251	49.7953
Total	**3.6293**	**5.2104**	**11.1080**	**0.0303**	**2.1039**	**0.0692**	**2.1731**	**0.5656**	**0.0675**	**0.6331**	**62.6734**	**3,300.5265**	**3,363.1999**	**3.2411**	**0.0381**	**3,455.5791**

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	2.8467	0.0584	3.0215	3.1000e-004		0.0185	0.0185		0.0185	0.0185	0.0000	32.2498	32.2498	5.3000e-003	5.0000e-004	32.5317
Energy	0.0329	0.2840	0.1386	1.8000e-003		0.0228	0.0228		0.0228	0.0228	0.0000	643.6146	643.6146	0.0376	0.0125	648.2668
Mobile	0.7497	4.8680	7.9479	0.0282	2.1039	0.0279	2.1319	0.5656	0.0263	0.5918	0.0000	2,594.6734	2,594.6734	0.1189	0.0000	2,597.6457
Waste						0.0000	0.0000		0.0000	0.0000	51.3993	0.0000	51.3993	3.0376	0.0000	127.3397
Water						0.0000	0.0000		0.0000	0.0000	9.0192	25.8183	34.8375	0.0336	0.0201	41.6792
Total	**3.6293**	**5.2104**	**11.1080**	**0.0303**	**2.1039**	**0.0692**	**2.1731**	**0.5656**	**0.0675**	**0.6331**	**60.4186**	**3,296.3561**	**3,356.7747**	**3.2330**	**0.0331**	**3,447.4630**

	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	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.60**	**0.13**	**0.19**	**0.25**	**13.10**	**0.23**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/28/2020	5	20	
2	Site Preparation	Site Preparation	1/29/2020	2/11/2020	5	10	
3	Grading	Grading	2/12/2020	3/24/2020	5	30	
4	Building Construction	Building Construction	3/25/2020	5/18/2021	5	300	
5	Paving	Paving	5/19/2021	6/15/2021	5	20	
6	Architectural Coating	Architectural Coating	6/16/2021	7/13/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 1,122,593; Residential Outdoor: 374,198; Non-Residential Indoor: 60,750; Non-Residential Outdoor: 20,250; Striped Parking Area: 12,456 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	989.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	8,125.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	391.00	84.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	78.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Demolition - 2020

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					0.1070	0.0000	0.1070	0.0162	0.0000	0.0162	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0331	0.3320	0.2175	3.9000e-004		0.0166	0.0166		0.0154	0.0154	0.0000	33.9986	33.9986	9.6000e-003	0.0000	34.2386
Total	**0.0331**	**0.3320**	**0.2175**	**3.9000e-004**	**0.1070**	**0.0166**	**0.1236**	**0.0162**	**0.0154**	**0.0316**	**0.0000**	**33.9986**	**33.9986**	**9.6000e-003**	**0.0000**	**34.2386**

3.2 Demolition - 2020

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	4.1900e-003	0.1442	0.0254	3.9000e-004	8.3700e-003	4.6000e-004	8.8400e-003	2.3000e-003	4.4000e-004	2.7500e-003	0.0000	37.8603	37.8603	1.9100e-003	0.0000	37.9080
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.8000e-004	3.9200e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0543	1.0543	3.0000e-005	0.0000	1.0550
Total	**4.7100e-003**	**0.1446**	**0.0293**	**4.0000e-004**	**9.5600e-003**	**4.7000e-004**	**0.0100**	**2.6200e-003**	**4.5000e-004**	**3.0700e-003**	**0.0000**	**38.9146**	**38.9146**	**1.9400e-003**	**0.0000**	**38.9630**

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					0.1070	0.0000	0.1070	0.0162	0.0000	0.0162	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6200e-003	0.0200	0.2328	3.9000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	33.9986	33.9986	9.6000e-003	0.0000	34.2385
Total	**4.6200e-003**	**0.0200**	**0.2328**	**3.9000e-004**	**0.1070**	**6.2000e-004**	**0.1076**	**0.0162**	**6.2000e-004**	**0.0168**	**0.0000**	**33.9986**	**33.9986**	**9.6000e-003**	**0.0000**	**34.2385**

3.2 Demolition - 2020

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	4.1900e-003	0.1442	0.0254	3.9000e-004	8.3700e-003	4.6000e-004	8.8400e-003	2.3000e-003	4.4000e-004	2.7500e-003	0.0000	37.8603	37.8603	1.9100e-003	0.0000	37.9080
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.8000e-004	3.9200e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0543	1.0543	3.0000e-005	0.0000	1.0550
Total	**4.7100e-003**	**0.1446**	**0.0293**	**4.0000e-004**	**9.5600e-003**	**4.7000e-004**	**0.0100**	**2.6200e-003**	**4.5000e-004**	**3.0700e-003**	**0.0000**	**38.9146**	**38.9146**	**1.9400e-003**	**0.0000**	**38.9630**

3.3 Site Preparation - 2020

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					0.0940	0.0000	0.0940	0.0502	0.0000	0.0502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0940**	**0.0110**	**0.1050**	**0.0502**	**0.0101**	**0.0603**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

3.3 Site Preparation - 2020

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	0.0344	1.1847	0.2084	3.2300e-003	0.0688	3.7800e-003	0.0726	0.0189	3.6200e-003	0.0226	0.0000	311.0365	311.0365	0.0157	0.0000	311.4281
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.3000e-004	2.3500e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6326	0.6326	2.0000e-005	0.0000	0.6330
Total	**0.0348**	**1.1849**	**0.2107**	**3.2400e-003**	**0.0695**	**3.7800e-003**	**0.0733**	**0.0191**	**3.6200e-003**	**0.0227**	**0.0000**	**311.6691**	**311.6691**	**0.0157**	**0.0000**	**312.0611**

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					0.0940	0.0000	0.0940	0.0502	0.0000	0.0502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3300e-003	0.0101	0.1043	1.9000e-004		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**2.3300e-003**	**0.0101**	**0.1043**	**1.9000e-004**	**0.0940**	**3.1000e-004**	**0.0943**	**0.0502**	**3.1000e-004**	**0.0505**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

3.3 Site Preparation - 2020

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	0.0344	1.1847	0.2084	3.2300e-003	0.0688	3.7800e-003	0.0726	0.0189	3.6200e-003	0.0226	0.0000	311.0365	311.0365	0.0157	0.0000	311.4281
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.3000e-004	2.3500e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6326	0.6326	2.0000e-005	0.0000	0.6330
Total	**0.0348**	**1.1849**	**0.2107**	**3.2400e-003**	**0.0695**	**3.7800e-003**	**0.0733**	**0.0191**	**3.6200e-003**	**0.0227**	**0.0000**	**311.6691**	**311.6691**	**0.0157**	**0.0000**	**312.0611**

3.4 Grading - 2020

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					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0668	0.7530	0.4794	9.3000e-004		0.0326	0.0326		0.0300	0.0300	0.0000	81.7264	81.7264	0.0264	0.0000	82.3872
Total	**0.0668**	**0.7530**	**0.4794**	**9.3000e-004**	**0.1301**	**0.0326**	**0.1627**	**0.0540**	**0.0300**	**0.0840**	**0.0000**	**81.7264**	**81.7264**	**0.0264**	**0.0000**	**82.3872**

3.4 Grading - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0400e-003	7.7000e-004	7.8500e-003	2.0000e-005	2.3700e-003	2.0000e-005	2.3900e-003	6.3000e-004	2.0000e-005	6.5000e-004	0.0000	2.1086	2.1086	5.0000e-005	0.0000	2.1099
Total	**1.0400e-003**	**7.7000e-004**	**7.8500e-003**	**2.0000e-005**	**2.3700e-003**	**2.0000e-005**	**2.3900e-003**	**6.3000e-004**	**2.0000e-005**	**6.5000e-004**	**0.0000**	**2.1086**	**2.1086**	**5.0000e-005**	**0.0000**	**2.1099**

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					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.0495	0.4950	9.3000e-004		1.5200e-003	1.5200e-003		1.5200e-003	1.5200e-003	0.0000	81.7263	81.7263	0.0264	0.0000	82.3871
Total	**0.0114**	**0.0495**	**0.4950**	**9.3000e-004**	**0.1301**	**1.5200e-003**	**0.1316**	**0.0540**	**1.5200e-003**	**0.0555**	**0.0000**	**81.7263**	**81.7263**	**0.0264**	**0.0000**	**82.3871**

3.4 Grading - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0400e-003	7.7000e-004	7.8500e-003	2.0000e-005	2.3700e-003	2.0000e-005	2.3900e-003	6.3000e-004	2.0000e-005	6.5000e-004	0.0000	2.1086	2.1086	5.0000e-005	0.0000	2.1099
Total	**1.0400e-003**	**7.7000e-004**	**7.8500e-003**	**2.0000e-005**	**2.3700e-003**	**2.0000e-005**	**2.3900e-003**	**6.3000e-004**	**2.0000e-005**	**6.5000e-004**	**0.0000**	**2.1086**	**2.1086**	**5.0000e-005**	**0.0000**	**2.1099**

3.5 Building Construction - 2020

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	0.2141	1.9378	1.7017	2.7200e-003		0.1128	0.1128		0.1061	0.1061	0.0000	233.9261	233.9261	0.0571	0.0000	235.3528
Total	**0.2141**	**1.9378**	**1.7017**	**2.7200e-003**		**0.1128**	**0.1128**		**0.1061**	**0.1061**	**0.0000**	**233.9261**	**233.9261**	**0.0571**	**0.0000**	**235.3528**

3.5 Building Construction - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0319	0.9973	0.2149	2.3400e-003	0.0557	4.6300e-003	0.0603	0.0161	4.4300e-003	0.0205	0.0000	224.4106	224.4106	0.0129	0.0000	224.7332
Worker	0.1366	0.1008	1.0333	3.0700e-003	0.3122	2.1700e-003	0.3144	0.0831	2.0000e-003	0.0851	0.0000	277.5646	277.5646	7.1700e-003	0.0000	277.7438
Total	**0.1684**	**1.0980**	**1.2482**	**5.4100e-003**	**0.3680**	**6.8000e-003**	**0.3748**	**0.0992**	**6.4300e-003**	**0.1056**	**0.0000**	**501.9752**	**501.9752**	**0.0201**	**0.0000**	**502.4770**

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	0.0331	0.2257	1.7635	2.7200e-003		4.1200e-003	4.1200e-003		4.1200e-003	4.1200e-003	0.0000	233.9258	233.9258	0.0571	0.0000	235.3526
Total	**0.0331**	**0.2257**	**1.7635**	**2.7200e-003**		**4.1200e-003**	**4.1200e-003**		**4.1200e-003**	**4.1200e-003**	**0.0000**	**233.9258**	**233.9258**	**0.0571**	**0.0000**	**235.3526**

3.5 Building Construction - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0319	0.9973	0.2149	2.3400e-003	0.0557	4.6300e-003	0.0603	0.0161	4.4300e-003	0.0205	0.0000	224.4106	224.4106	0.0129	0.0000	224.7332
Worker	0.1366	0.1008	1.0333	3.0700e-003	0.3122	2.1700e-003	0.3144	0.0831	2.0000e-003	0.0851	0.0000	277.5646	277.5646	7.1700e-003	0.0000	277.7438
Total	**0.1684**	**1.0980**	**1.2482**	**5.4100e-003**	**0.3680**	**6.8000e-003**	**0.3748**	**0.0992**	**6.4300e-003**	**0.1056**	**0.0000**	**501.9752**	**501.9752**	**0.0201**	**0.0000**	**502.4770**

3.5 Building Construction - 2021

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	0.0932	0.8542	0.8122	1.3200e-003		0.0470	0.0470		0.0442	0.0442	0.0000	113.5023	113.5023	0.0274	0.0000	114.1868
Total	**0.0932**	**0.8542**	**0.8122**	**1.3200e-003**		**0.0470**	**0.0470**		**0.0442**	**0.0442**	**0.0000**	**113.5023**	**113.5023**	**0.0274**	**0.0000**	**114.1868**

3.5 Building Construction - 2021

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0127	0.4403	0.0933	1.1300e-003	0.0270	9.2000e-004	0.0280	7.8200e-003	8.8000e-004	8.7000e-003	0.0000	107.8271	107.8271	5.9200e-003	0.0000	107.9752
Worker	0.0612	0.0436	0.4566	1.4400e-003	0.1515	1.0200e-003	0.1525	0.0403	9.4000e-004	0.0412	0.0000	129.9886	129.9886	3.1100e-003	0.0000	130.0662
Total	**0.0739**	**0.4839**	**0.5499**	**2.5700e-003**	**0.1785**	**1.9400e-003**	**0.1805**	**0.0481**	**1.8200e-003**	**0.0499**	**0.0000**	**237.8157**	**237.8157**	**9.0300e-003**	**0.0000**	**238.0414**

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	0.0161	0.1095	0.8556	1.3200e-003		2.0000e-003	2.0000e-003		2.0000e-003	2.0000e-003	0.0000	113.5021	113.5021	0.0274	0.0000	114.1867
Total	**0.0161**	**0.1095**	**0.8556**	**1.3200e-003**		**2.0000e-003**	**2.0000e-003**		**2.0000e-003**	**2.0000e-003**	**0.0000**	**113.5021**	**113.5021**	**0.0274**	**0.0000**	**114.1867**

3.5 Building Construction - 2021

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0127	0.4403	0.0933	1.1300e-003	0.0270	9.2000e-004	0.0280	7.8200e-003	8.8000e-004	8.7000e-003	0.0000	107.8271	107.8271	5.9200e-003	0.0000	107.9752
Worker	0.0612	0.0436	0.4566	1.4400e-003	0.1515	1.0200e-003	0.1525	0.0403	9.4000e-004	0.0412	0.0000	129.9886	129.9886	3.1100e-003	0.0000	130.0662
Total	**0.0739**	**0.4839**	**0.5499**	**2.5700e-003**	**0.1785**	**1.9400e-003**	**0.1805**	**0.0481**	**1.8200e-003**	**0.0499**	**0.0000**	**237.8157**	**237.8157**	**9.0300e-003**	**0.0000**	**238.0414**

3.6 Paving - 2021

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	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0126**	**0.1292**	**0.1465**	**2.3000e-004**		**6.7800e-003**	**6.7800e-003**		**6.2400e-003**	**6.2400e-003**	**0.0000**	**20.0235**	**20.0235**	**6.4800e-003**	**0.0000**	**20.1854**

3.6 Paving - 2021

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	3.4000e-004	3.5800e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0177	1.0177	2.0000e-005	0.0000	1.0183
Total	**4.8000e-004**	**3.4000e-004**	**3.5800e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0177**	**1.0177**	**2.0000e-005**	**0.0000**	**1.0183**

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	2.8000e-003	0.0122	0.1730	2.3000e-004		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.8000e-003**	**0.0122**	**0.1730**	**2.3000e-004**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**	**0.0000**	**20.0235**	**20.0235**	**6.4800e-003**	**0.0000**	**20.1854**

3.6 Paving - 2021

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	3.4000e-004	3.5800e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.1900e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	1.0177	1.0177	2.0000e-005	0.0000	1.0183
Total	**4.8000e-004**	**3.4000e-004**	**3.5800e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.1900e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.0177**	**1.0177**	**2.0000e-005**	**0.0000**	**1.0183**

3.7 Architectural Coating - 2021

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	4.1569					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	**4.1591**	**0.0153**	**0.0182**	**3.0000e-005**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.8000e-004**	**0.0000**	**2.5576**

3.7 Architectural Coating - 2021

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4900e-003	1.7800e-003	0.0186	6.0000e-005	6.1700e-003	4.0000e-005	6.2100e-003	1.6400e-003	4.0000e-005	1.6800e-003	0.0000	5.2921	5.2921	1.3000e-004	0.0000	5.2953
Total	**2.4900e-003**	**1.7800e-003**	**0.0186**	**6.0000e-005**	**6.1700e-003**	**4.0000e-005**	**6.2100e-003**	**1.6400e-003**	**4.0000e-005**	**1.6800e-003**	**0.0000**	**5.2921**	**5.2921**	**1.3000e-004**	**0.0000**	**5.2953**

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	4.1569					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.0000e-004	1.2900e-003	0.0183	3.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	**4.1572**	**1.2900e-003**	**0.0183**	**3.0000e-005**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**2.5533**	**2.5533**	**1.8000e-004**	**0.0000**	**2.5576**

3.7 Architectural Coating - 2021

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4900e-003	1.7800e-003	0.0186	6.0000e-005	6.1700e-003	4.0000e-005	6.2100e-003	1.6400e-003	4.0000e-005	1.6800e-003	0.0000	5.2921	5.2921	1.3000e-004	0.0000	5.2953
Total	**2.4900e-003**	**1.7800e-003**	**0.0186**	**6.0000e-005**	**6.1700e-003**	**4.0000e-005**	**6.2100e-003**	**1.6400e-003**	**4.0000e-005**	**1.6800e-003**	**0.0000**	**5.2921**	**5.2921**	**1.3000e-004**	**0.0000**	**5.2953**

4.0 Operational Detail - Mobile

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	0.7497	4.8680	7.9479	0.0282	2.1039	0.0279	2.1319	0.5656	0.0263	0.5918	0.0000	2,594.6734	2,594.6734	0.1189	0.0000	2,597.6457
Unmitigated	0.7497	4.8680	7.9479	0.0282	2.1039	0.0279	2.1319	0.5656	0.0263	0.5918	0.0000	2,594.6734	2,594.6734	0.1189	0.0000	2,597.6457

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	959.10	922.30	846.40	2,165,818	2,165,818
Apartments Mid Rise	216.84	208.52	191.36	489,663	489,663
Condo/Townhouse	677.10	660.02	563.64	1,520,764	1,520,764
General Office Building	138.51	30.78	13.11	251,416	251,416
High Turnover (Sit Down Restaurant)	215.33	268.20	223.25	259,912	259,912
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	553.66	647.90	327.37	937,660	937,660
Total	2,760.54	2,737.72	2,165.13	5,625,232	5,625,232

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
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	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Condo/Townhouse	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.559358	0.040058	0.190549	0.109335	0.016678	0.005213	0.023344	0.044042	0.002152	0.002669	0.005545	0.000316	0.000739
Condo/Townhouse	0.559358	0.040058	0.190549	0.109335	0.016678	0.005213	0.023344	0.044042	0.002152	0.002669	0.005545	0.000316	0.000739
General Office Building	0.559358	0.040058	0.190549	0.109335	0.016678	0.005213	0.023344	0.044042	0.002152	0.002669	0.005545	0.000316	0.000739
High Turnover (Sit Down Restaurant)	0.559358	0.040058	0.190549	0.109335	0.016678	0.005213	0.023344	0.044042	0.002152	0.002669	0.005545	0.000316	0.000739
Parking Lot	0.559358	0.040058	0.190549	0.109335	0.016678	0.005213	0.023344	0.044042	0.002152	0.002669	0.005545	0.000316	0.000739
Regional Shopping Center	0.559358	0.040058	0.190549	0.109335	0.016678	0.005213	0.023344	0.044042	0.002152	0.002669	0.005545	0.000316	0.000739

5.0 Energy Detail

Historical Energy Use: N

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						0.0000	0.0000		0.0000	0.0000	0.0000	317.6581	317.6581	0.0313	6.4800e-003	320.3733
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	317.6581	317.6581	0.0313	6.4800e-003	320.3733
NaturalGas Mitigated	0.0329	0.2840	0.1386	1.8000e-003		0.0228	0.0228		0.0228	0.0228	0.0000	325.9565	325.9565	6.2500e-003	5.9800e-003	327.8935
NaturalGas Unmitigated	0.0329	0.2840	0.1386	1.8000e-003		0.0228	0.0228		0.0228	0.0228	0.0000	325.9565	325.9565	6.2500e-003	5.9800e-003	327.8935

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/yr	tons/yr										MT/yr					
Apartments Mid Rise	2.008e+006	0.0108	0.0925	0.0394	5.9000e-004		7.4800e-003	7.4800e-003		7.4800e-003	7.4800e-003	0.0000	107.1545	107.1545	2.0500e-003	1.9600e-003	107.7912
Apartments Mid Rise	453982	2.4500e-003	0.0209	8.9000e-003	1.3000e-004		1.6900e-003	1.6900e-003		1.6900e-003	1.6900e-003	0.0000	24.2262	24.2262	4.6000e-004	4.4000e-004	24.3702
Condo/Townhouse	2.77174e+006	0.0150	0.1277	0.0544	8.2000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	147.9107	147.9107	2.8300e-003	2.7100e-003	148.7897
General Office Building	367270	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	19.5989	19.5989	3.8000e-004	3.6000e-004	19.7154
High Turnover (Sit Down Restaurant)	419800	2.2600e-003	0.0206	0.0173	1.2000e-004		1.5600e-003	1.5600e-003		1.5600e-003	1.5600e-003	0.0000	22.4021	22.4021	4.3000e-004	4.1000e-004	22.5353
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	87400	4.7000e-004	4.2800e-003	3.6000e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.6640	4.6640	9.0000e-005	9.0000e-005	4.6917
Total		**0.0329**	**0.2840**	**0.1386**	**1.8000e-003**		**0.0228**	**0.0228**		**0.0228**	**0.0228**	**0.0000**	**325.9565**	**325.9565**	**6.2400e-003**	**5.9700e-003**	**327.8935**

5.2 Energy by Land Use - NaturalGas

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/yr	tons/yr										MT/yr					
Apartments Mid Rise	2.008e +006	0.0108	0.0925	0.0394	5.9000e-004		7.4800e-003	7.4800e-003		7.4800e-003	7.4800e-003	0.0000	107.1545	107.1545	2.0500e-003	1.9600e-003	107.7912
Apartments Mid Rise	453982	2.4500e-003	0.0209	8.9000e-003	1.3000e-004		1.6900e-003	1.6900e-003		1.6900e-003	1.6900e-003	0.0000	24.2262	24.2262	4.6000e-004	4.4000e-004	24.3702
Condo/Townhouse	2.77174e +006	0.0150	0.1277	0.0544	8.2000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	147.9107	147.9107	2.8300e-003	2.7100e-003	148.7897
General Office Building	367270	1.9800e-003	0.0180	0.0151	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	19.5989	19.5989	3.8000e-004	3.6000e-004	19.7154
High Turnover (Sit Down Restaurant)	419800	2.2600e-003	0.0206	0.0173	1.2000e-004		1.5600e-003	1.5600e-003		1.5600e-003	1.5600e-003	0.0000	22.4021	22.4021	4.3000e-004	4.1000e-004	22.5353
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	87400	4.7000e-004	4.2800e-003	3.6000e-003	3.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	4.6640	4.6640	9.0000e-005	9.0000e-005	4.6917
Total		**0.0329**	**0.2840**	**0.1386**	**1.8000e-003**		**0.0228**	**0.0228**		**0.0228**	**0.0228**	**0.0000**	**325.9565**	**325.9565**	**6.2400e-003**	**5.9700e-003**	**327.8935**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	219543	29.2775	2.8900e-003	6.0000e-004	29.5277
Apartments Mid Rise	971058	129.4965	0.0128	2.6400e-003	130.6034
Condo/Townhouse	610077	81.3575	8.0300e-003	1.6600e-003	82.0529
General Office Building	237120	31.6214	3.1200e-003	6.5000e-004	31.8917
High Turnover (Sit Down Restaurant)	72450	9.6617	9.5000e-004	2.0000e-004	9.7442
Parking Lot	72660	9.6897	9.6000e-004	2.0000e-004	9.7725
Regional Shopping Center	199120	26.5539	2.6200e-003	5.4000e-004	26.7809
Total		**317.6581**	**0.0313**	**6.4900e-003**	**320.3733**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	219543	29.2775	2.8900e-003	6.0000e-004	29.5277
Apartments Mid Rise	971058	129.4965	0.0128	2.6400e-003	130.6034
Condo/Townhouse	610077	81.3575	8.0300e-003	1.6600e-003	82.0529
General Office Building	237120	31.6214	3.1200e-003	6.5000e-004	31.8917
High Turnover (Sit Down Restaurant)	72450	9.6617	9.5000e-004	2.0000e-004	9.7442
Parking Lot	72660	9.6897	9.6000e-004	2.0000e-004	9.7725
Regional Shopping Center	199120	26.5539	2.6200e-003	5.4000e-004	26.7809
Total		**317.6581**	**0.0313**	**6.4900e-003**	**320.3733**

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	2.8467	0.0584	3.0215	3.1000e-004		0.0185	0.0185		0.0185	0.0185	0.0000	32.2498	32.2498	5.3000e-003	5.0000e-004	32.5317
Unmitigated	2.8467	0.0584	3.0215	3.1000e-004		0.0185	0.0185		0.0185	0.0185	0.0000	32.2498	32.2498	5.3000e-003	5.0000e-004	32.5317

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	0.4157					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.3367					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.7600e-003	0.0236	0.0101	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003	0.0000	27.3398	27.3398	5.2000e-004	5.0000e-004	27.5023
Landscaping	0.0916	0.0348	3.0114	1.6000e-004		0.0166	0.0166		0.0166	0.0166	0.0000	4.9100	4.9100	4.7800e-003	0.0000	5.0294
Total	**2.8467**	**0.0584**	**3.0215**	**3.1000e-004**		**0.0185**	**0.0185**		**0.0185**	**0.0185**	**0.0000**	**32.2498**	**32.2498**	**5.3000e-003**	**5.0000e-004**	**32.5317**

6.2 Area by SubCategory

Mitigated

	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	0.4157					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.3367					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.7600e-003	0.0236	0.0101	1.5000e-004		1.9100e-003	1.9100e-003		1.9100e-003	1.9100e-003	0.0000	27.3398	27.3398	5.2000e-004	5.0000e-004	27.5023
Landscaping	0.0916	0.0348	3.0114	1.6000e-004		0.0166	0.0166		0.0166	0.0166	0.0000	4.9100	4.9100	4.7800e-003	0.0000	5.0294
Total	**2.8467**	**0.0584**	**3.0215**	**3.1000e-004**		**0.0185**	**0.0185**		**0.0185**	**0.0185**	**0.0000**	**32.2498**	**32.2498**	**5.3000e-003**	**5.0000e-004**	**32.5317**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	34.8375	0.0336	0.0201	41.6792
Unmitigated	41.2627	0.0418	0.0251	49.7953

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	18.3734 / 11.5833	23.9302	0.0241	0.0145	28.8512
Condo/Townhouse	7.94879 / 5.01119	10.3528	0.0104	6.2700e-003	12.4817
General Office Building	3.37694 / 2.06974	4.3706	4.4300e-003	2.6600e-003	5.2748
High Turnover (Sit Down Restaurant)	0.758834 / 0.0484362	0.7877	9.8000e-004	5.9000e-004	0.9892
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.40738 / 0.862586	1.8215	1.8400e-003	1.1100e-003	2.1984
Total		**41.2627**	**0.0418**	**0.0251**	**49.7953**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	14.6987 / 11.5833	20.2254	0.0194	0.0116	24.1715
Condo/Townhouse	6.35903 / 5.01119	8.7500	8.3800e-003	5.0300e-003	10.4572
General Office Building	2.70155 / 2.06974	3.6897	3.5600e-003	2.1300e-003	4.4147
High Turnover (Sit Down Restaurant)	0.607067 / 0.0484362	0.6346	7.8000e-004	4.8000e-004	0.7959
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.1259 / 0.862586	1.5377	1.4800e-003	8.9000e-004	1.8399
Total		**34.8375**	**0.0336**	**0.0202**	**41.6792**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	51.3993	3.0376	0.0000	127.3397
Unmitigated	51.3993	3.0376	0.0000	127.3397

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	129.72	26.3320	1.5562	0.0000	65.2364
Condo/Townhouse	56.12	11.3919	0.6732	0.0000	28.2228
General Office Building	17.67	3.5869	0.2120	0.0000	8.8863
High Turnover (Sit Down Restaurant)	29.75	6.0390	0.3569	0.0000	14.9613
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	19.95	4.0497	0.2393	0.0000	10.0329
Total		**51.3993**	**3.0376**	**0.0000**	**127.3397**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	129.72	26.3320	1.5562	0.0000	65.2364
Condo/Townhouse	56.12	11.3919	0.6732	0.0000	28.2228
General Office Building	17.67	3.5869	0.2120	0.0000	8.8863
High Turnover (Sit Down Restaurant)	29.75	6.0390	0.3569	0.0000	14.9613
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	19.95	4.0497	0.2393	0.0000	10.0329
Total		**51.3993**	**3.0376**	**0.0000**	**127.3397**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

ATTACHMENT F. TRAFFIC NOISE OUTPUTS

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Project-generated volumes along Blake Drive between Garner Drive and 98th Avenue (PM Peak)

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	163.0
Average automobile speed (mph):	25.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

person

Distance from center of 12-ft wide, single lane roadway (ft): 50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA): 51.9

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Cumulative plus project traffic volumes along 98th Avenue between Pippin Street and San Leandro Street (PM Peak)

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	678.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

person

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	60.3

FEHR & PEERS

MEMORANDUM

Date: December 2, 2020

To: Emilie Wolfson, Urban Planning Partners

From: Sam Tabibnia, Fehr & Peers

Subject: 98th Avenue and San Leandro Street Project – Transportation and Parking Demand Management Plan

OK18-0273

The proposed 98th Avenue and San Leandro Street project is required to prepare a Transportation and Parking Demand Management (TDM) Plan per the *City of Oakland's Transportation Impact Review Guidelines* and the City's Standard Conditions of Approval because the project would generate more than 50 net new peak hour trips. Since the project would generate more than 100 net new peak hour trips, the goal of the TDM Plan is to achieve a 20 percent vehicle trip reduction (VTR). This memorandum describes the project and setting, lists the mandatory TDM strategies that the project shall implement to achieve the 20 percent VTR, provides the additional strategies that should be considered if the 20 percent VTR is not achieved, and describes the monitoring, evaluation, and enforcement of the TDM Plan.

PROJECT DESCRIPTION

The proposed project would be located at the northeast corner of the 98th Avenue/San Leandro Street intersection in Oakland. The project would consist of 399 residential units, including 122 townhomes, seven (7) live/work units, and 270 apartments, and 11,688 square feet of work/live space (nine (9) work/live units) and about 2,468 square feet of retail space, for a total of approximately 14,156 square feet of commercial space. The project would provide two off-street parking spaces in an attached garage for each of the townhomes and between 0.90 and 1.06 parking spaces per unit for the apartments, the work/live, and live/work units in four parking garages for each of the multi-family buildings, for a total of 517 parking spaces.

Access to the site would be provided through existing Blake Street, which connects to 98th Avenue to the south, and existing Ellington Way, which connects to 92nd Avenue to the north.

PROJECT LOCATION

Located in East Oakland, the project is in a medium to high density area with streets generally in a grid and sidewalks on the majority of the streets. It is located near a few existing neighborhood-serving retail and industrial uses.

The project is about 1.4 miles south of the Coliseum BART station and about 1.6 miles north of the San Leandro BART station. The project is served by AC Transit bus service along 98th Avenue (Line 98, with 20-minute headways). Line 98 also serves the Coliseum BART station; however the service between the project site and the Coliseum BART station is not direct. AC Transit is currently constructing the East Bay Bus Rapid Transit (BRT) Project along International Boulevard, where buses would operate in exclusive bus lanes between downtown Oakland and San Leandro. The nearest BRT stop to the project site would be on International Boulevard, just north of 96th Avenue, about 0.6 mile east of the project.

Currently, there are no bikeways within the project area or vicinity. Planned bikeways near the project area include Class 1 bicycle path along the BART tracks adjacent to San Leandro Street (Also known as the East Bay Greenway, which will ultimately provide a Class 1 path between downtown Oakland and Fremont mostly along BART right-of-way), Class 2 bicycle lanes on San Leandro Street, and Class 3 bicycle boulevards on segments of 92nd Avenue, B Street, and 94th Avenue.

Due to the minimal number of jobs or neighborhood amenities within walking and biking distance of the project, and minimal local and regional transit service in the project area, the project area has a relatively high rate of driving, including both drive-alone and carpool. This is evidenced in part by the travel patterns of the area's existing residents. Based on US Census data, **Table 1** summarizes vehicle ownership for households with employed residents, and **Table 2** summarizes the commute mode split for residents in the project census tract. About 93 percent of the households in the project census tract have at least one vehicle available with an average of 2.0 automobiles available per household. Similarly, about 87 percent of the employed residents in the project census tract drive to work.

The project is estimated to generate 2,290 daily, 146 AM peak hour, and 188 PM peak hour automobile trips. The number of automobile trips generated by the project is estimated to be 23 percent less than the trips generated by a typical suburban residential development, as shown in **Table 3**. The trip generation accounts for the reduction in trips due to the project location and mix of uses, including the work/live and live/work units which would allow residents of these units to work in the same unit and not make the commute trips.

TABLE 1
VEHICLE OWNERSHIP FOR EMPLOYED RESIDENTS

Vehicles Available	Percent of Households with Employed Residents
No vehicle available	7%
1 vehicle available	32%
2 vehicles available	27%
3 vehicles available	22%
4 or more vehicles available	11%
Total	**100%**

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, Census Tract 4094, Table B08203.

TABLE 2
JOURNEY TO WORK FOR EMPLOYED RESIDENTS

Transportation Mode	Percent of Households with Employed Residents
Automobile	67%
Carpool	20%
Public Transit	11%
Bicycle	<1%
Walking	<1%
Work from Home	2%
Total	**100%**

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, Census Tract 4094, Table B08006.

TABLE 3
TRIP GENERATION BY TRAVEL MODE

Mode	Mode Share Adjustment Factors[1]	Daily	AM Peak Hour	PM Peak Hour
Automobile	76.9%	2,290	146	188
Transit	17.9%	530	34	44
Bike	1.9%	60	4	5
Walk	2.0%	60	4	6
	Total Trips	**2,940**	**188**	**242**

1. Based on the alternative trip generation and the City of Oakland TIRG assuming project site is in an urban environment more than 1.0 miles of a BART Station and over 10,000 people per square mile population density. Percentages do not add to 100%

Source: Fehr & Peers, 2020

Similarly, the project is also expected to generate a vehicle-miles traveled (VMT) per resident that is about 23 percent less than the regional average, as the residential VMT per capita in the project TAZ is 11.6, compared to the regional average of 15.0, as documented in the Project CEQA Analysis document.

MANDATORY TDM STRATEGIES

This section describes the mandatory strategies that shall be implemented as part of the project. These strategies shall be directly implemented by the project applicant and project management. **Table 4** describes all mandatory TDM strategies that apply to the project, as well as the effectiveness of each strategy based on research primarily compiled in Quantifying Greenhouse Gas Mitigation Measures (California Air Pollution Control Officers Association (CAPCOA), August 2010) and other available sources. The CAPCOA report is a resource for local agencies to quantify the benefit, in terms of reduced travel demand, of implementing various TDM strategies.

The City of Oakland Standard Conditions of Approval lists infrastructure and operational strategies that must be incorporated into a TDM plan based on project location, size, and/or other characteristics. **Appendix A** presents these strategies and indicates if and how they apply to the proposed project.

TABLE 4
MANDATORY TDM PROGRAM COMPONENTS

TDM Strategy	Description	Estimated Vehicle Trip Reduction[1]
Infrastructure Improvements	Various improvements	N/A[2]
Limited Parking Supply (apartments, work/live, and live/work units only)	Project provides about 1.0 off-street parking space per unit for the apartment, work/live, and live/work units, less than the 2.0 auto ownership per household in the project area.	5 – 9%[3]
Unbundled Parking (apartments, work/live, and live/work units only)	Residents of the apartment, work/live, and live/work units are required to pay for a parking space separately from their monthly rent	
Residential Parking Management (apartments, work/live, and live/work units only)	Restrict on-site parking to a maximum of one parking space per unit, thereby discouraging multiple car ownership	
Carshare Parking Spaces	Dedicated on-site carshare parking spaces	<1%
Bicycle Parking Supply Monitoring	Monitor usage of the bicycle parking facilities and increase supply if necessary	<1%
Transit Fare Subsidy	Provide transit subsidy to residents and employees[4]	4 - 10%
Carpool and Ride-Matching Assistance	Assist project residents and employees in forming carpools	1%
Guaranteed Ride Home	Promotion of and enrollment of residents in Alameda County's Guaranteed Ride Home program	N/A[2]
TDM Coordinator	Coordinator responsible for implementing and managing the TDM Plan	N/A[2]
Marketing and Resident Education	Active marketing of carpooling, BART, AC Transit, bikesharing, and other non-auto modes	
	Estimated Vehicle Trip Reduction	**10% – 21%**

1. The focus of the CAPCOA document is reductions to VMT but the research used to generate the reductions also indicates vehicle trip reductions are applicable as well. For the purposes of this analysis the VTR is assumed to equal the VMT reduction. See the cited CAPCOA research for more information and related information on page 8 of the BAAQMD *Transportation Demand Management Tool User's Guide* (June 2012).
2. The effectiveness of this strategy cannot be quantified at this time. This does not necessarily imply that the strategy is ineffective. It only demonstrates that existing literature does not provide a robust methodology for calculating its

effectiveness. In addition, many strategies are complementary to each other and isolating their specific effectiveness may not be feasible.
3. Available research suggests that limited parking supply combined with unbundled parking can result in up to 20% VTR. However, these results assume minimal other parking facilities in the area. Thus, they are adjusted because free unrestricted on-street parking is available in the project area.
4. Assuming a subsidy of about $2.00 per unit and per employee per day (value to transit user) available to all residents and employees.

Source: Fehr & Peers, 2020.

The mandatory strategies in Table 4 are generally targeted at project residents. While some of the mandatory strategies would also affect the travel behavior of residential visitors and retail employees and customers, these groups are not directly targeted with TDM programs. The number of retail employees would be small relative to the total number of residents, and visitors and customers would likely not be aware of TDM programs or visit frequently enough to make them cost effective.

The TDM strategies include both one-time physical improvements and on-going operational strategies. Physical improvements will be constructed as part of the project and are therefore anticipated to have a one-time capital cost. Some level of ongoing maintenance cost may also be required for certain improvements. Operational strategies provide on-going incentives and support for the use of non-auto transportation modes. These TDM measures have monthly or annual costs and will require on-going management.

A more detailed description of the TDM measures that comprise the mandatory TDM program is provided below:

- *Infrastructure Improvements* – the following infrastructure improvements in the vicinity of the project, as identified in the project site plan review to improve the bicycling, walking, and transit systems in the area would further encourage the use of these modes:
  - Install stop signs at all approaches of the Tubman Drive/Blake Drive and Garner Drive/ Blake Drive intersections.
  - Relocate the driveway for the Parcel D Building on Tubman Drive to either align directly opposite of Blake Drive or the Parcel E alley.
  - Provide 20 feet of red curb on either side of the project driveways and the private alleys on Garner and Tubman Drives and 10 feet of red curb on all approaches of the Garner Drive/Dunbar Drive, and Tubman Drive/Ellington Way intersections to ensure adequate sight distance.
  - Ensure that the final building placement and site circulation would not prevent at least one future non-motorized connection between the project site and the future East Bay Greenway if the adjacent existing railroad tracks are abandoned

- Contribute to the completion of the Neighborhood Bike Routes as identified in the 2019 Oakland Bike Plan in the vicinity of the project. The Neighborhood Bike Routes consist of segments of 92nd Avenue, B Street, D Street, Elmhurst Avenue, and 94th Avenue, in order to facilitate non-vehicular connections between the project site and public transportation amenities and commercial uses in the area. The contribution amount shall be paid to the City of Oakland Department of Transportation before first Building Permit final, in the amount designated in a City of Oakland Engineer's Estimate.
- Ensure that the bike rooms in the four project multi-family buildings are directly accessible from the main entrances on their ground floor and can accommodate the 130 long-term bicycle parking spaces proposed, as shown in Table 4 of the project Transportation Impact Review Memorandum.
- 98th Avenue/San Leandro Street: If determined feasible by City staff, install dual directional curb ramps with truncated domes and high-visibility crosswalks at all four corners of the intersection.
- 98th Avenue/Medford Avenue/Blake Drive: If determined feasible by City staff, install dual directional curb ramps with truncated domes and high-visibility crosswalks at all four corners of the intersection.
- Dunbar Drive/Tubman Drive: If determined feasible by City staff, install curb extensions (bulb-outs), dual directional curb ramps with truncated domes and high-visibility crosswalks at all four corners of the intersection.
- Dunbar Drive/Garner Drive: If determined feasible by City staff, install dual directional curb ramps with truncated domes and high-visibility crosswalks at all four corners of the intersection; install curb extensions (bulb-outs) on the west side of the intersection.
- Provide advanced yield markings and signage on both directions of Blake Drive approaching the midblock crosswalk.
- Provide a high visibility crosswalk in addition to the bulb-out on the west side of the midblock crosswalk.
- If determined feasible by City staff, widen the sidewalk on the north side of 98th Avenue to 12 feet to improve pedestrian comfort and accommodate a bus stop shelter.
- If determined feasible by City staff and AC Transit, relocate the existing bus stops in both directions of 98th Avenue adjacent to the project site to be closer to the intersection with Blake Drive/Medford Avenue, and provide amenities, such as bus shelter, seating, and pedestrian-scale lighting, at the relocated bus stops.
- If determined feasible by City staff and AC Transit, provide concrete pads within the street right-of-way at the bus stops in both directions of 98th Avenue adjacent to the project site.
- If the sidewalk on the north side of 98th Avenue is widened, provide amenities, such as bus shelter, seating, and pedestrian-scale lighting, at the existing bus stop on westbound 98th Avenue adjacent to the project site.

- Ensure that the Parcel A garage provides a minimum of 11 PEV-ready and 21 PEV-capable parking spaces
- Ensure that the Parcel B garage provides a minimum of 8 PEV-ready and 15 PEV-capable parking spaces
- Ensure that the Parcel C garage provides a minimum of 4 PEV-ready and 7 PEV-capable parking spaces
- Ensure that the Parcel D garage provides a minimum of 6 PEV-ready and 11 PEV-capable parking spaces
- Designate at least 20 feet of curb on Blake Drive near the retail component of the project as white loading zone for passenger pick-up/drop-off.
- If determined feasible by City staff, improve paving surface at the 98th Avenue railroad crossing to provide smooth travel path. Construct ADA compliant sidewalks with truncated domes to enhance safety. Ensure sidewalk widths are adequate and gate equipment does not impede travel path.
- If determined feasible by City staff, improve paving surface at the 92nd Avenue railroad crossing to provide smooth travel path. Construct ADA compliant sidewalks with truncated domes to enhance pedestrian safety. Ensure sidewalk widths are adequate and gate equipment does not impede travel path. Install advanced railroad crossing warning sign W10-1 (railroad crossing warning sign) on 92nd Avenue.
- If determined feasible by City staff, install W10-2 signs (parallel railroad crossing at an intersection warning sign) on both directions of San Leandro Street approaching the at-grade crossings on 92 and 98th Avenues.

- *Limited Parking Supply (Apartments, Work/Live and Live/Work Units Only)* – The project would provide 273 off-street automobile parking spaces for the 270 apartments and nine work/live, and seven live/work units, which corresponds to about 0.95 spaces per unit. This is less than the current average auto ownership of 2.0 per household in the project area, as shown in Table 1.

- *Unbundle Parking (Apartments, Work/Live, and Live/Work Units Only)* – Unbundle parking costs from housing costs (as required by Oakland Municipal Code, Section 17.116.310) for the apartment, work/live, and live/work components of the project. This would result in residents paying one price for the residential unit and a separate price for parking, should they opt for a space. The price of a parking space can be adjusted so that resident parking demand matches the project's parking supply.

- *Residential Parking Management (Apartments, Work/Live, and Live/Work Units Only)* – Restrict parking to one parking space per unit or less, thereby discouraging multiple car ownership and/or use for the apartment, work/live, and live/work components of the project. Exceptions will only be made for residents with management approved Reasonable Accommodation Requests. A Reasonable Accommodation Request shall need to demonstrate a hardship wherein a household requires more than one vehicle per unit. Examples could include households with multiple disabled residents requiring vehicles or households with multiple residents with places of work inaccessible via transit.

- *Carshare Parking Spaces* – Offer to dedicate for free at least four total on-site parking spaces (one per building) available for carsharing. Monitor the usage of the carsharing spaces and adjust if necessary.

- *Bicycle Parking Supply Monitoring* – The project management shall monitor the usage of both long-term and short-term bicycle parking throughout the project and provide additional bicycle parking, if necessary.

- *Guaranteed Ride Home* – Encourage project residents who work in Alameda County and commercial tenants to register for and promote the Alameda County Transportation Commission Guaranteed Ride Home (GRH) program. GRH programs encourage the use of alternative modes of transportation by offering free rides home if an illness or crisis occurs, if the employee is required to work unscheduled overtime, if a carpool or vanpool is unexpectedly unavailable, or if a bicycle problem arises. The Alameda County Transportation Commission offers their GRH service for all registered permanent employees who are employed within Alameda County, live within 100 miles of their worksite, and do not drive alone to work. The GRH program is offered at no cost to the employer, and employers are not required to register in order for their employees to enroll and use the program.

- *Transit Fare Subsidy* – Provide a monthly transit benefit to each dwelling unit. Options include providing discounted Adult 31-Day AC Transit Pass (valued at $84.60 as of September 2020), AC Transit EasyPass, or monthly Clipper Card contributions.

- *Carpool and Ride-Matching Assistance Program* – The project shall offer personalized ride-matching assistance to pair residents and/or employees interested in forming commute carpools. Similar to the "Casual Carpool" system used in the Bay Area, a pre-determined location in the project site shall be identified for carpoolers to pick up passengers. The curb space for carpool pick-ups shall be designated for passenger loading only during the weekday morning peak commute period. As an enhancement, the project can use services such as ZimRide, Scoop, Enterprise RideShare, or 511.org RideShare. A similar personalized ride-matching assistance program can also be provided to site employees.

- *On-Site TDM Coordinator* – The project shall designate an on-site TDM coordinator responsible for implementing and managing the TDM Plan. The TDM coordinator would also be responsible for ensuring that all residents, employees, and visitors are aware of their transportation options and would serve as a point of contact regarding theTDM programs.

- *Marketing and Resident Education* – Site management shall provide residents and employees information about transportation options. This information would also be posted at central location(s) and be updated as necessary. This information shall include:

  - *Transit Routes* – Promote the use of transit by providing user-focused maps. These maps provide residents with wayfinding to nearby transit stops and transit-accessible destinations and are particularly useful for those without access to portable mapping applications. The project could consider installing real-time transit information, such as TransitScreen, in a visible location to provide residents with up-to-date transit arrival and departure times.

- *Transit Fare Discounts* – Provide information about local discounted fare options offered by BART and AC Transit, including discounts for youth, elderly, persons with disabilities, and Medicare cardholders.
- *Car Sharing* – Promote accessible car sharing programs, such as GiG, Zipcar, and Getaround by informing residents and employees of on-site and nearby car sharing locations and applicable membership information.
- *Ridesharing* – Provide residents and employees with phone numbers and contact information for ride sharing options including Uber, Lyft, and Oakland taxi cab services.
- *Carpooling* – Provide residents and employees with phone numbers and contact information for carpool matching services such as the Metropolitan Transportation Commission's 511 RideMatching.
- *Walking and Biking Events* – Provide information about local biking and walking events, such as Oaklavia, as events are planned.
- *Bikeshare/Scooters* – Educate residents and employees about nearby bike sharing station locations and membership information (if and when bikeshare stations are provided in the project area) and dockless bikeshare/scooters.

ADDITIONAL OPERATIONAL STRATEGIES

If the mandatory measures do not meet the required goal of 20 percent VTR, and additional vehicle trip reduction is needed, the project shall consider the implementation of some or all of the following additional strategies to limit automobile use and encourage non-automotive travel.

- *Carshare Memberships* – Provide residents with free or discounted carshare membership to offset the cost of car sharing programs and reduce the demand for private vehicle ownership.
- *Increased Transit Fare Subsidy* – Increase the transit fare subsidy for project residents and employees.
- *Personalized Trip Planning* – In the form of in-person assistance or as a web tool, provides residents and employees with a customized menu of options for commuting. Trip planning reduces the barriers the residents and employees see to making a walk, bike, or transit trip to the site. Transit trip making tools, such as those available from Google or 511.org, could be promoted to inform residents and employees of transit options to/from work. Providing a preferred walking map routes to residents and employees living within one mile of the site and a bicycling route map to all residents and employees living within five miles of the site would be a proactive strategy to encourage those employees to use alternatives to driving.
- *Restrict on-street Parking* – Limit all on-street parking spaces within the project area to two hours or less during the daytime and/or prohibit overnight parking to discourage long-term on-street parking and vehicle ownership in the project.

- *BART Shuttle* – Provide a frequent (20 to 30 minute headways), direct weekday shuttle service between the project and the Coliseum BART station during both the weekday morning and evening peak commute periods. This service could be operated by a private contractor or by AC Transit. Shuttles shall be fully accessible to passengers using wheelchairs and other mobility services and have the capacity to transport bicycles. In addition, provide a real-time smart-phone app that tracks real-time arrivals to make shuttle use more reliable and convenient.
- *Bikeshare/Scooter Membership* – Provide residents and employee a subsidy to offset the cost of bikeshare and/or scooter membership and encourage the use of non-automobile modes.
- Geofencing the Project Area - If determined feasible by City staff, restrict ride-hailing (Uber and Lyft) pick-ups and drop offs to the project retail frontage along Blake Street only by geofencing the rest of the project site.

TDM MONITORING, EVALUATION AND ENFORCEMENT

Consistent with the requirements of the City's Standard Conditions of Approval for projects that generate more than 100 net new peak hour trips and contain ongoing operational strategies, this TDM program requires regular periodic evaluation to determine if the program goal of reducing automobile trips has been satisfied and to assess the effectiveness of the implemented strategies. Beginning the first year after the development and occupancy of the project, project management must prepare an annual TDM monitoring report consisting of the following:

- Summary of implemented TDM measures and their effectiveness (e.g. bicycle parking occupancy, number of transit passes issued, etc.)
- Results of project resident and employee transportation surveys to monitor the vehicle trip generation and mode share for project residents and employees
- Weekday AM and PM peak period and daily traffic volume counts at the project garage driveways and on internal project streets

As previously discussed, the goal of the TDM program is to reduce the number of vehicle trips generated by the project by 20 percent. This level would correspond to a total project vehicle trip generation of no more than 117 trips during the AM peak hour and 150 in the PM peak hour.

Based on the results of the surveys, TDM programs shall be increased if these goals are not met. This program ensures the implementation of the mandatory TDM measures and related requirements through compliance with the Mitigation Monitoring and Reporting Program, as implemented through the Conditions of Approval adopted for the project.

The first monitoring report must be prepared one year after full occupancy of the first phase of the project, and subsequent monitoring reports must be prepared annually. If following the annual monitoring the TDM goals are not satisfied, additional measures shall be implemented, with consultation with City staff, until the goal is met.

If in two successive years the project's TDM goals are not satisfied, site management shall prepare and submit for City approval a Corrective Action Plan. The Corrective Action Plan shall detail the additional TDM measures to be implemented on site and their expected modal split reduction.

If, one year after the Corrective Action Plan is implemented, the required automobile mode share reduction target is still not being achieved, or if site management fails to submit a report as described above, or if the reports do not meet City requirements outlined above, the City may, in addition to its other remedies, 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.

If in five successive years the project is found to meet the stated TDM goal, additional surveys and monitoring shall be suspended until such a time as the City deems they are needed.

Please contact Sam Tabibnia (s.tabibnia@fehrandpeers.com or 510-835-1943) with questions or comments.

APPENDIX A
TDM PROGRAM CONSISTENCY WITH CITY REQUIREMENTS

TDM Strategy	Required When	Required for Proposed Project?
Bus boarding bulbs or islands	• A bus boarding bulb or island does not already exist, and a bus stop is located along the project frontage; and/or • A bus stop along the project frontage serves a route with 15 minutes or better peak hour service and has a shared bus-bike lane curb	No. A bus stop is located along the project frontage. However, the bus line has 20 minute peak hour headways.
Bus shelter	• A stop with no shelter is located within the project frontage, or • The project is located within 0.10 miles of a flag stop with 25 or more boardings per day	**Yes, a bus stop is located along the project frontage, and the project would provide a shelter at this location.**
Concrete bus pad	• A bus stop is located along the project frontage and a concrete bus pad does not already exist	**Yes, a bus stop is located along the project frontage and a concrete bus pad does not currently exist.**
Curb extensions or bulb-outs	• Identified as an improvement within site analysis	**Yes, the project would provide curb extensions at the intersections internal to the site.**
Implementation of a corridor-level bikeway improvement	• A buffered Class 2 or Class 4 bikeway facility is in a local or county adopted plan within 0.10 miles of the project location; and • The project would generate 500 or more daily bicycle trips	No, the project would not generate 500 or more daily bicycle trips.
Implementation of a corridor-level transit capital improvement	• A high-quality transit facility is in a local or county adopted plan within 0.25 miles of the project location; and • The project would generate 400 or more peak period transit trips	No, the project would not generate 400 or more peak period transit trips.
Installation of amenities such as lighting; pedestrian-oriented green infrastructure, trees, or other greening landscape; and trash receptacles per the Pedestrian Master Plan and any applicable streetscape plan	• Always required	**Yes, the project would provide pedestrian amenities within the project site and adjacent to the site.**

APPENDIX A
TDM PROGRAM CONSISTENCY WITH CITY REQUIREMENTS

TDM Strategy	Required When	Required for Proposed Project?
Installation of safety improvements identified in the Pedestrian Master Plan (such as crosswalk striping, curb ramps, count down signals, bulb outs, etc.)	• When improvements are identified in the Pedestrian Master Plan along project frontage or at an adjacent intersection	No, the Pedestrian Master Plan does not identify specific improvements in the project vicinity, but the project would provide high-visibility crosswalk striping, truncated domes, raised crosswalks, and directional curb ramps within the project site.
In-street bicycle corral	• A project includes more than 10,000 square feet of ground floor retail, is located along a Tier 1 bikeway, and on-street vehicle parking is provided along the project frontages.	No, the project does not include more than 10,000 square feet of ground floor retail.
Intersection improvements, including but not limited to visibility improvements, shortening corner radii, pedestrian safety islands, accounting for pedestrian desire lines.	• Identified as an improvement within site analysis	**Yes, the project would provide curb extensions and parking restrictions at the intersections within the site.**
New sidewalk, curb ramps, curb and gutter meeting current City and ADA standards	• Always required	**Yes, the project would upgrade the sidewalks within the project and along project frontages.**
No monthly permits and establish minimum price floor for public parking	• If proposed parking ratio exceeds 1:1000 sf (commercial)	No, the project would not provide off-street commercial parking.
Parking garage is designed with retrofit capability	• Optional if proposed parking ratio exceeds 1:1.25 (residential) or 1:1000 sf (commercial)	No, the project parking garages would not have retrofit capability.
Parking space reserved for car share	• A project is located within downtown (CBD and D-LM zones). One car share space preserved for buildings between 50 – 200 units, then one car share space per 200 units.	**Yes, although the project is not located in downtown, it would offer to dedicate at least four total parking spaces (one per building) for carsharing.**
Paving, lane striping or restriping (vehicle and bicycle), and signs to midpoint of street section	• Typically required	**Yes, provided.**

APPENDIX A
TDM PROGRAM CONSISTENCY WITH CITY REQUIREMENTS

TDM Strategy	Required When	Required for Proposed Project?
Pedestrian crossing improvements, pedestrian-supportive signal changes, including but not limited to reducing signal cycle lengths to less than 90 seconds to avoid pedestrian crossings against the signal, providing a leading pedestrian interval, provide a "scramble" signal phase where appropriate.	• Identified as an improvement within site analysis • Identified as an improvement within operations analysis	No, not identified in the project site analysis.
Real-time transit information system	• A project frontage block includes a bus stop or BART station and is along a Tier 1 transit route with 2 or more routes or peak period frequency of 15 minutes or better	No, a BART station or a bus stop with peak period frequency of 15 minutes or better are not located along the project frontage.
Relocating bus stops to far side	• A project is located within 0.10 mile of any active bus stop that is currently near-side	No, no active near-side bus stops are currently located within 0.1 miles of the site.
Signal upgrades, including typical traffic lights, pedestrian signals, bike actuated signals, transit only signals	• Project size exceeds 100 residential units, 80,000 sf of retail, or 100,000 sf of commercial; and • Project frontage abuts an intersection with signal infrastructure older than 15 years	No, the project is not adjacent to an intersection with signal infrastructure older than 15 years.
Transit queue jumps	• Identified as a needed improvement within operations analysis of a project with frontage along a Tier 1 transit route with 2 or more routes or peak period frequency of 15 minutes or better	No, the project does not have frontage along any Tier 1 transit route.
Trenching and placement of conduit for providing traffic signal interconnect	• Project size exceeds 100 units, 80,000 sf of retail, or 100,000 sf of commercial; and • Project frontage block is identified for signal interconnect improvements as part of a planned ITS improvement; and • A major transit improvement is identified within operations analysis requiring traffic signal interconnect	No, major transit improvements have not been identified in an operations analysis requiring traffic signal interconnect.
Unbundled parking	• New multifamily dwelling residential facilities of ten (10) or more units, with the exception of affordable housing	**Yes, the apartment, live/ work, and work/live components of the project would unbundle parking**

Sources: City of Oakland Transportation Impact Review Guidelines, 2017 and City of Oakland Municipal Code, 2018

FEHR & PEERS

MEMORANDUM

Date: December 2, 2020

To: Emilie Wolfson, UPP

From: Sam Tabibnia, Fehr & Peers

Subject: 98th Avenue and San Leandro Street Project – Transportation Assessment (non-CEQA)

OK18-0273

This memorandum summarizes the non-CEQA transportation assessment that Fehr & Peers completed for the proposed 98th Avenue and San Leandro Street project in Oakland. This document provides a brief description of the project, an estimate of project trip generation, an analysis of project impacts on intersection operations, a review of the project site plan and surrounding areas for access and circulation for various modes, and analysis of collision history, including at the adjacent at-grade railroad crossings. This memorandum also includes recommendations to improve multi-modal access, circulation, and safety.

PROJECT DESCRIPTION

The proposed project would be located at the northeast corner of the 98th Avenue/San Leandro Street intersection in Oakland (**Figure 1**). The project would consist of 399 residential units, including 122 townhomes, seven live/work units, and 270 apartments, and 11,688 square feet of work/live spaces (nine work/live units) and about 2,468 square feet of retail space for a total of approximately 14,156 square feet of commercial space.

Access to the site would be provided through existing Blake Street, which currently connects to 98th Avenue to the south, and existing Ellington Way, which currently connects to 92nd Avenueto the north. The project would extend Blake Drive to the north to intersect with the extension of Tubman Drive. The project would also extend Garner and Tubman Drives to the west, where they would form a cul-de-sac just east of the railroad tracks. The townhomes would be located at the eastern portion of the site (Parcels E, through G) fronting Blake and Dunbar Drives with auto access to each unit's private garage provided through alleys.

The apartment, live/work, and work/live units would be accommodated in four buildings on the west and north sides of the project site (Parcels A through D). Each building would provide its own parking garage with access to the Parcel A and B buildings provided on Garner Drive and access to the Parcel C and D buildings provided on Tubman Drive. The project would provide 517 off-street parking spaces throughout the site.

A north-south Woonerf/emergency access street would connect Garner and Tubman Drives between Parcels B and E, near the west side of the project site. North of Tubman Drive, the Woonerf becomes a linear park. The commercial component of the project would be located at the northwest corner of the 98th Avenue/Blake Drive intersection in the Parcel A building.

In 2005, the City of Oakland certified the *Arcadia Park Residential Development Project EIR* (2005 EIR) for development of 366 residential units at the project site. About 168 single-family units have been completed since the certification of the 2005 EIR.

TRIP GENERATION AND INTERSECTION COUNTS

Trip generation is the process of estimating the number of vehicles that would likely access the project. Trip generation data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual* (Tenth Edition) was used as a starting point to estimate the vehicle trip generation. **Table 1** presents the trip generation for the proposed project.

ITE does not include trip generation data for work/live or live/work units, which display unique travel behavior. Residents of work/live and live/work units are expected to complete some or all of their work from home, rather than commuting to their place of employment. Therefore, the ITE data for mid-rise multi-family housing (Code 221) was used to estimate trip generation for the residential component of the work/live and live/work units. A variety of uses, including office, retail, and/or light industrial, may occupy the non-residential component of the work/live and live/work units. This analysis applies the ITE data for office (Code 710) and retail (Code 820) to the non-residential component of the work/live and live/work units (which is about 55[1] percent of the 20,914 square feet of the work/live and live/work units, corresponding to about 5,750 square feet of office and 5,750 square feet of retail for a total of 11,500 square feet).

[1]The most recent project submittal shows that commercial space accounts for approximately 45 percent of the total floor area in the work/live and live/work units. The analysis conservatively assumes that 55 percent of these units' floor area consists of commercial uses.

TABLE 1

VEHICLE TRIP GENERATION

Land Use	Size[1]	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Townhomes [2]	122 DU	880	13	45	58	44	26	70
Apartments [3]	270 DU	1,470	24	67	91	70	45	115
Work/Live and Live/Work Units								
Office [4]	5.75 KSF	60	6	1	7	1	6	7
Retail [5]	5.75 KSF	220	3	2	5	11	11	22
Residential [3]	16 DU	90	2	4	6	5	3	8
Internalization [6]		-20	-1	-1	-2	-1	-1	-2
Subtotal		*350*	*10*	*6*	*16*	*16*	*19*	*35*
High Turnover Restaurant [7]	2.5 KSF	280	14	11	25	15	9	24
	Subtotal	2,980	61	129	190	145	99	244
City of Oakland Trip Generation Adjustment [8]		-690	-14	-30	-44	-33	-23	-56
	Net-New Vehicle Trip Generation	**2,290**	**47**	**99**	**146**	**112**	**76**	**188**

1. DU = Dwelling Units, KSF = 1,000 square feet
2. ITE Trip Generation (10th Edition) land use category 220 (Multifamily Housing - Low Rise, General Urban/ Suburban):
   Daily: T = 7.56*(X)-40.86
   AM Peak Hour: Ln(T) = 0.95*Ln(X)-0.51 (23% in, 77% out)
   PM Peak Hour: Ln(T) = 0.89*Ln(X)-0.02 (63% in, 37% out)
3. ITE Trip Generation (10th Edition) land use category 220 (Multifamily Housing - Mid Rise, General Urban/ Suburban):
   Daily: T = 5.45*(X)-1.75
   AM Peak Hour: Ln(T) = 0.98*Ln(X)-0.98 (26% in, 74% out)
   PM Peak Hour: Ln(T) = 0.96*Ln(X)-0.63 (61% in, 39% out)
4. ITE Trip Generation (10th Edition) land use category 710 (General Office Building, General Urban/Suburban):
   Daily: Ln(T) = 9.74*X
   AM Peak Hour: T = 1.16*X (86% in, 14% out)
   PM Peak Hour: Ln(T)=1.15*X (16% in, 84% out)
5. ITE Trip Generation (10th Edition) land use category 820 (Shopping Center, General Urban/Suburban):
   Daily: Ln(T) = 37.75*X
   AM Peak Hour: T = 0.94*X (62% in, 38% out)
   PM Peak Hour: T = 3.81*X (48% in, 52% out)
6. Residential trips adjusted by -10% (daily), -22% (AM) and -12% (PM) to account for 50 percent internalization of home-based work trips. Per the Alameda CTC Countywide Travel Demand Model, home-based work trips comprise 20% of daily, 44% of AM peak period and 24% of PM peak period trips for residential units. The non-residential trips also adjusted accordingly to account for the other end of the trips.
7. ITE Trip Generation (10th Edition) land use category 932 (High-Turnover Restaurant, General Urban/Suburban):
   Daily: T = 112.18*(X)
   AM Peak Hour: T = 9.94*(X) (55% in, 45% out)
   PM Peak Hour: T = 9.77*(X) (62% in, 38% out)
8. The 23.1% reduction is based on the City of Oakland's *TIRG* for development in an urban environment more than 1.0 miles from a BART Station and over 10,000 people per square mile population density. Based on US Census data, the project census tract has a population of 5,311 people and is about 0.5 square miles, corresponding to a population density of 10,973 people per square mile.

Source: Fehr & Peers, 2020.

To account for the internalization of residents who work on-site, a 50 percent reduction in home-based work trips was assumed based on the assumption that each unit would have an average of two workers and one would work on-site. According to the Alameda County Transportation Commission (CTC) Countywide Travel Demand Model, home-based work trips account for 20 percent of daily, 44 percent of AM peak period, and 24 percent of PM peak period trips; therefore, reductions of 10 percent for daily trips (50 percent x 20 percent), 22 percent for AM trips (50 percent x 44 percent) and 12 percent for PM trips (50 percent x 24 percent) is applied to the residential trips and the same reduction is applied to the non-residential trips to account for both ends of these internal trips.

The ITE data is based on data collected at mostly single-use suburban sites where the automobile is often the only travel mode. However, the project site is in an urban environment near other uses where some trips are walk, bike, or transit trips. Since the project is more than a mile from the Coliseum BART Station and has a population density of over 10,000 people per square mile, this analysis reduces the ITE based trip generation by 23.1 percent to account for the non-automobile trips. This reduction is consistent with City of Oakland TIRG and based on Census commute data for Alameda County from the 2014 5-Year Estimates of the American Community Survey (ACS), which shows that the non-automobile mode share for urban areas over a mile from a BART Station is about 23.1 percent.

The proposed development would generate an estimated 2,290 daily, 146 AM peak hour, and 188 PM peak hour trips.

Non-Vehicular Trip Generation

Consistent with the City of Oakland TIRG, **Table 2** presents the trip generation estimates for all travel modes for the proposed development.

TABLE 2
TRIP GENERATION BY TRAVEL MODE

Mode	Mode Share Adjustment Factors[1]	Daily	AM Peak Hour	PM Peak Hour
Automobile	76.9%	2,290	146	188
Transit	17.9%	530	34	44
Bike	1.9%	60	4	5
Walk	2.0%	60	4	5
	Total Trips	**2,940**	**188**	**242**

1. Based on the alternative trip generation and the City of Oakland TIRG assuming project site is in an urban environment more than 1.0 miles of a BART Station and over 10,000 people per square mile population density. Percentages do not add to 100%

Source: Fehr & Peers, 2020

Trip Distribution and Study Intersection Selection

The trip distribution and assignment process is used to estimate how the vehicle trips generated by a project site would be distributed across the roadway network. The direction of approach to and departure from the project site was determined based on the following trip distribution used in the 2005 EIR:

- 25% - 98th Avenue east of International Boulevard
- 4% - 98th Avenue west of I-880
- 16% - San Leandro Street north
- 4% - San Leandro Street south
- 13% - I-880 north
- 7% - I-880 south
- 15% - International Boulevard north
- 16% - International Boulevard south

Trips generated by the project, as shown in **Table 1**, were assigned to the roadway network according to the trip distribution described above.

According to the City of Oakland's TIRG, the criteria for selecting study intersections include the following:

a. All intersection(s) of streets adjacent to project site;
b. All signalized intersections, all-way stop-controlled intersections, or roundabouts where 100 or more peak hour trips are added by the project;
c. All signalized intersections with 50 or more peak-hour trips and the existing intersection operations are at Level of Service D, E, or F; and
d. Side-street stop-controlled intersection(s) where 50 or more peak hour trips are added by the project to any individual movement other than the major-street through movement.

Following these criteria, this analysis evaluates the following intersections due to being adjacent to the project site:

1. 92nd Avenue/Ellington Way
2. 98th Avenue/Blake Drive
3. 98th Avenue/San Leandro Street

Automobile turning movements, pedestrian counts, and bicycle counts were collected at these intersections during the AM and PM peak commuting hours (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) on January 24, 2019, a typical weekday with local schools in normal session, moderate weather, and no observed traffic incidents. **Figure 2** shows the existing volumes and **Appendix A** provides the raw traffic counts.

INTERSECTION OPERATIONS

Intersection operations under Existing Conditions and Existing Plus Project conditions were analyzed for the three study intersections. The traffic volumes, intersection lane configurations, and traffic controls presented on **Figure 2** form the basis for the intersection level of service (LOS) analysis under Existing Conditions.[3] The project trip assignment was added to the Existing Conditions peak hour traffic volumes to estimate the Existing plus Project peak hour traffic volumes

Table 3 summarizes the results of the intersection operations analysis under Existing Conditions and Existing Plus Project conditions. **Appendix B** provides the detailed intersection LOS calculation worksheets.

TABLE 3
EXISTING AND EXISTING PLUS PROJECT CONDITIONS
STUDY INTERSECTION LOS SUMMARY

Intersection	Traffic Control[1]	Peak Hour	Existing		Existing Plus Project[3]	
			Delay[2] (seconds)	LOS[2]	Delay[2] (seconds)	LOS[2]
1. 92nd Avenue/ Ellington Way	SSSC	AM	1 (13)	A (B)	2 (13)	A (B)
		PM	<1 (11)	A (B)	<1 (11)	A (B)
2. 98th Avenue/ Blake Drive	SSSC	AM	<1 (18)	A (C)	1 (20)	A (C)
		PM	1 (32)	A (D)	1 (33)	A (D)
3. 98th Avenue/ San Leandro Street	Signalized	AM	63	E	64	E
		PM	47	D	47	D

1. SSSC = Side-Street Stop-Controlled
2. Average intersection delay and LOS based on the 2010 HCM method. Average delay is reported for signalized intersections. Average and worst-approach delays, respectively, are reported for side-street stop-controlled intersections.
3. The Existing Plus Project analysis was completed for a slightly larger project which generated less than 10 percent more trips than the proposal project described earlier in this memorandum. Thus, the results presented in this table are slightly worse than expected.

Source: Fehr & Peers, 2020.

[3] The operations of roadway facilities are typically described with the term level of service (LOS), a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, which reflects free-flow conditions where there is very little interaction between vehicles, to LOS F, where the vehicle demand exceeds the capacity and high levels of vehicle delay result. LOS E represents "at-capacity" operations. When traffic volumes exceed the intersection capacity, stop-and-go conditions result and a vehicle may wait through multiple signal cycles before passing through the intersection; these operations are designated as LOS F.

All study intersections operate at LOS D or better under both Existing and Existing Plus Project conditions, except for the 98th Avenue/San Leandro Street during the AM peak hour, which operates at LOS E. The project would increase average intersection delay at the 98th Avenue/San Leandro Street intersection by less than one second during both the AM and PM peak hours, which would not be noticeable to most motorists. Neither of the two side-street stop-controlled intersections would meet the peak hour signal warrant under Existing or Existing Plus Project conditions.

SITE ACCESS AND CIRCULATION ANALYSIS

Fehr & Peers reviewed the project site plan dated May 26, 2020 and the existing street network adjacent to the project site to evaluate safety, access, and circulation for all travel modes.

Automobile Access and Circulation

Primary automobile access to the site would be provided through Blake Drive connecting to 98th Avenue to the south. Secondary automobile access would be through Ellington Way connecting to 92nd Avenue to the north. The project would extend Blake, Garner, and Tubman Drives within the project site to provide access to the various project buildings. The internal streets within the project would have a 26-foot two-way travel width which would be adequate to accommodate typical automobile and bicycle traffic, as well as emergency vehicle access. The internal project streets would provide eight-foot parallel parking lanes on either one or both sides of the streets. The project site plan does not indicate the intersection control for the new intersections created by the project.

Each project townhome would include an attached two-car garage that would be accessed through private alleys. The private alleys would be 20-foot wide with no parking allowed which would accommodate the flow of passenger automobiles that would use the alleys.

The project would include four buildings that would accommodate the apartment, work/live, and live/work components of the project. Each building would provide a parking garage with between 36 and 106 parking spaces. Each garage would be accessed through one driveway. The driveways for the Parcels A and B buildings would be located on Garner Drive and the driveways for Parcels C and D buildings would be located on Tubman Drive. Based on the project site plan, the garage driveways would be set back from the adjacent sidewalks by a six-foot planting buffer, which would provide adequate sight distance between vehicles exiting the garage and pedestrians on either side of the adjacent sidewalk. The driveways may not have adequate sight distance between exiting vehicles and vehicles or bicyclists on the adjacent street due to parked cars. The driveway for Parcel D would be located on Tubman Drive adjacent to and between Blake Drive and the Parcel E Private

Alley. The offset intersections may result in potential conflicts between vehicles turning into or out of the closely spaced intersections.

The Woonerf/emergency access street connecting Garner and Tubman Drives would be 26 feet wide, with no on-street parking, which would provide adequate emergency access for the Parcel B building.

Tubman and Garner Drives, west of the Woonerf, would be cul-de-sacs approximately 110 feet long, which would ensure adequate emergency vehicles access throughout the site.

Recommendation 1: While not required to address a CEQA impact, and at the discretion of City of Oakland staff, the following should be required as part of the final design for the project:

- Install stop signs at all approaches of the Tubman Drive/Blake Drive and Garner Drive/Blake Drive intersections.
- Relocate the driveway for the Parcel D Building on Tubman Drive to either align directly opposite of Blake Drive or the Parcel E alley.
- Provide 20 feet of red curb on either side of the project driveways and the private alleys on Garner and Tubman Drives and 10 feet of red curb on all approaches of the Garner Drive/Dunbar Drive, and Tubman Drive/Ellington Way intersections to ensure adequate sight distance.

Bicycle Access and Bicycle Parking

Currently, there are no bicycle facilities within the project area or vicinity. The City's 2019 Oakland Bike Plan (*Let's Bike Oakland*, May 2019) proposes the following in the vicinity of the project:

- Class 1 bicycle path along the BART tracks adjacent to San Leandro Street (Also known as the East Bay Greenway which will ultimately provide a Class 1 path between downtown Oakland and Fremont mostly along BART right-of-way)
- Class 3 Neighborhood Bike Route on segments of 92nd Avenue, B Street, D Street, Elmhurst Avenue, and 94th Avenue that would connect San Leandro Street, International Boulevard, and Bancroft Avenue

Chapter 17.117 of the Oakland Municipal Code requires long-term and short-term bicycle parking for new buildings. Long-term bicycle parking includes lockers or locked enclosures, and short-term bicycle parking includes bicycle racks. The Code requires no long-term bicycle parking for multi-family units with private automobile garages for each unit, one long-term space for every four multi-family units without private parking garage, and one short-term space for every 20 multi-family units regardless of automobile parking. For commercial uses, the Code requires one long-term space for every 12,000 square feet of floor area and one short-term space for every 20,000 square feet of floor area. The minimum requirement is two spaces for each long-term and short-term space.

Table 4 presents the bicycle parking requirements for the proposed project. Overall, the project would be required to provide at least 74 long-term bicycle parking spaces and 22 short-term spaces. The project site plan identifies 130 long-term bicycle parking spaces in bike rooms located in the garages and adjacent to the main lobby of the four multi-family buildings. However, the project site plan does not identify the quantity of the long-term bicycle parking provided in each building. The project site plan identifies short-term bicycle parking in the form of bicycle racks throughout the project site, including near the main entrance of the four multi-family buildings, at the project entry plaza adjacent to the retail component of the project on Blake Drive, and on Tubman Drive adjacent to the project open space. The project would provide short-term bicycle parking for 78 bicycles, exceeding the requirement.

TABLE 4
BICYCLE PARKING REQUIREMENTS

		Long-Term		Short-Term	
Land Use	**Size[1]**	**Spaces per Unit[2]**	**Spaces**	**Spaces per Unit[2]**	**Spaces**
Townhomes	122 DU	0	0	1:20 DU	6
Apartments, Work/ Live, and Live/Work Units					
Parcel A	106 DU	1:4 DU	26	1:20 DU	5
Parcel B	86 DU		22		4
Parcel C	34 DU		9		2
Parcel D	60 DU		15		3
Retail	3.0 KSF	1:12 KSF	2	1:20 KSF	2
Total Required Bicycle Spaces			74		22
Total Bicycle Parking Provided			130		78
Bicycle Parking Met?			**Yes**		**Yes**

1. DU = dwelling unit, KSF = 1,000 square feet
2. Based on Oakland Municipal Code Sections 17.117.090 and 17.117.110

Source: Fehr & Peers, 2020.

Recommendation 2: While not required to address a CEQA impact, and at the discretion of City of Oakland staff, the following should be considered as part of the final design for the project:

- Ensure that the final building placement and site circulation would not prevent at least one future non-motorized connection between the project site and the future East Bay Greenway if the adjacent existing railroad tracks are abandoned.
- Contribute to the completion of the Neighborhood Bike Routes as identified in the 2019 Oakland Bike Plan in the vicinity of the project. The Neighborhood Bike Routes consist of segments of 92nd Avenue, B Street, D Street, Elmhurst Avenue, and 94th Avenue, in order to facilitate non-vehicular connections between the project site and public transportation amenities and commercial uses in the area. The contribution amount shall be paid to the City of Oakland Department of Transportation before first Building Permit final, in the amount designated in a City of Oakland Engineer's Estimate.
- Ensure that the bike rooms in the four project multi-family buildings are directly accessible from the main entrances on their ground floor and can accommodate the 130 long-term bicycle parking spaces proposed, as shown in Table 4.

Pedestrian Access and Circulation

Most streets in the vicinity of the project site provide sidewalks on both sides of the street, except on the east side of San Leandro Street, adjacent to the BART tracks, and the residential streets adjacent to the project site. Alameda County Transportation Commission is currently planning the East Bay Greenway, a Class 1 path that would ultimately connect downtown Oakland and Fremont along the BART right-of- way, including the segment adjacent to the project site. No sidewalks are also provided along the west side of Dunbar Street between Garner and Tubman Drives, west side of Blake Drive between 98th Avenue and Garner Drive, and north side of Garner Drive between Blake and Dunbar Drives. The frontages along these streets have not been developed and sidewalks will be completed as part of the proposed project.

The existing sidewalks along 98th Avenue adjacent to the project site are currently about nine feet wide. Speed feedback signs are also provided in both directions on 98th Avenue in the vicinity of the project.

Pedestrian facilities at the intersections adjacent to the site include:

- The San Leandro Street/98th Avenue intersection is a signalized intersection that provides diagonal curb ramps with truncated domes on all four corners and high visibility crosswalks across all four approaches. Currently, no sidewalks are provided on the east side of San Leandro Street. The intersection provides pedestrian countdown signal heads and push buttons on all four approaches.

- The 98th Avenue/Medford Avenue/Blake Drive intersection is a side street stop-controlled intersection with stop signs on both the northbound Medford Avenue and southbound Blake Drive approaches. The intersection provides diagonal curb ramps with truncated domes on all four corners. The east and west pedestrian crossings across 98th Avenue are high visibility crosswalks, with advanced yield markings and signage. The north approach crosswalk across Blake Drive is standard striping. The south approach crosswalk across Medford Avenue is not marked. The intersection provides "Keep Clear" pavement markings across 98th Avenue.

- The Garner Drive/Dunbar Drive intersection is a side street stop-controlled T intersection with a stop sign on the eastbound Garner Drive intersection. No curb ramps or marked crosswalks are provided at this intersection. No sidewalks are provided at the northwest corner of the intersection.

- The Tubman Drive/Dunbar Drive intersection is an all-way stop-controlled intersection. Dunbar Drive is off-set by about 25 feet across Tubman Drive. The intersection provides a marked crosswalk across the southbound Dunbar Drive approach and diagonal curb ramps with truncated domes on all approaches, except the southwest corner. No sidewalks are provided at the southwest corner of the intersection.

The project would include the following features that would benefit pedestrian access and circulation in the project area and surroundings:

- Minimum six-foot sidewalks with minimum four-foot landscaped buffer along commercial frontages. Where there is a constraint in the right-of-way, the minimum six-foot sidewalk width takes precedence over the landscaped buffer.
- A minimum 8.5-foot buffer and a six-foot walkway just north of the existing sidewalk along the north side of 98th Avenue.
- Minimum eight-foot sidewalks along both sides of the Woonerf separated from the automobile lane by landscaping, bollards, and/or detectable warning strips.
- A midblock pedestrian crossing on Blake Drive between Tubman and Garner Drives to provide a pedestrian paseo connecting Dunbar Drive and Woonerf. The mid-block crossing would also provide a bulb-out on the west side of Blake Drive.
- Pedestrian-scale lighting and street trees/plantings along the project sidewalks and plazas, and the walkways along the project frontage. All of these amenities are to be clear of the accessible walkway space, per ADA Standards.

- At the Tubman Drive/Blake Drive and Garner Drive/Blake Drive intersections, high-visibility crosswalks, curb extensions (bulb-outs), and directional curb ramps on all approaches.

The following recommendations are provided to further enhance pedestrian access for the project site:

Recommendation 3: While not required to address a CEQA impact, and at the discretion of City of Oakland staff, the following should be considered as part of the final design for the project:

- 98th Avenue/San Leandro Street: If determined feasible by City staff, install dual directional curb ramps with truncated domes and high-visibility crosswalks at all four corners of the intersection.
- 98th Avenue/Medford Avenue/Blake Drive: If determined feasible by City staff, install dual directional curb ramps with truncated domes and high-visibility crosswalks at all four corners of the intersection.
- Dunbar Drive/Tubman Drive: If determined feasible by City staff, install curb extensions (bulb-outs), dual directional curb ramps with truncated domes and high-visibility crosswalks at all four corners of the intersection.
- Dunbar Drive/Garner Drive: If determined feasible by City staff, install dual directional curb ramps with truncated domes and high-visibility crosswalks at all four corners of the intersection; install curb extensions (bulb-outs) on the west side of the intersection.

Recommendation 4: While not required to address a CEQA impact, and at the discretion of City of Oakland staff, the following should be considered as part of the final design for the project:

- Provide advanced yield markings and signage on both directions of Blake Drive approaching the midblock crosswalk.
- Provide a high visibility crosswalk in addition to the bulb-out on the west side of the midblock crosswalk.

Recommendation 5: While not required to address a CEQA impact, and at the discretion of City of Oakland staff, the following should be considered as part of the final design for the project:

- If determined feasible by City staff, widen the sidewalk on the north side of 98th Avenue to 12 feet to improve pedestrian comfort and accommodate a bus stop shelter.

Transit Access

Transit service providers in the vicinity of the proposed project include Bay Area Rapid Transit and AC Transit.

BART provides regional rail service throughout the East Bay and across the Bay. The project is about 1.3 miles south of the Coliseum BART Station. The project would not modify access between the project site and the BART Station.

AC Transit is the primary bus service provider in the City of Oakland. As described in **Table 5**, AC Transit operates Line 98 on 98th Avenue adjacent to the project site. Nearest bus stops to the project site are in both directions of 98th Avenue just west of the railroad tracks. Buses stop in the travel lane at both bus stops on 98th Avenue. No amenities, except bus stop signage, are provided at these locations. Recommendation 5 would widen the sidewalk along the project frontage on the north side of 98th Avenue and would provide adequate space for bus stop amenities, such as a bus shelter.

TABLE 5
EXISTING PUBLIC TRANSIT

Line	Description	Weekday Hours of Operation	Weekday Headways[1]	Weekend Hours of Operation	Weekend Headways
98	Coliseum BART to Eastmont Transit Center via Oakport St., Edgewater Dr., 98th Ave. and MacArthur Blvd	5:00 AM – 11:00 PM	20 min	6:00 AM – 10:00 PM	30 min

Source: AC Transit and Fehr & Peers, 2019.

AC Transit is currently constructing the East Bay Bus Rapid Transit (BRT) Project, which would replace Routes 1 and 801 along International Boulevard east of the project. BRT buses would operate in exclusive lanes along International Boulevard connecting downtown Oakland and San Leandro. The nearest BRT stop to the project site would be on International Boulevard, just north of 96th Avenue, about 0.6 mile east of the project.

> **Recommendation 6:** While not required to address a CEQA impact, and at the discretion of City of Oakland staff, the following should be considered as part of the final design for the project:

- If determined feasible by City staff and AC Transit, relocate the existing bus stops in both directions of 98th Avenue adjacent to the project site to be closer to the intersection with Blake Drive/Medford Avenue, and provide amenities, such as bus shelter, seating, and pedestrian-scale lighting, at the relocated bus stops.
- If determined feasible by City staff and AC Transit, provide concrete pads within the street right-of-way at the bus stops in both directions of 98th Avenue adjacent to the project site.
- If Recommendation 5 is implemented, provide amenities, such as bus shelter, seating, and pedestrian-scale lighting, at the existing bus stop on westbound 98th Avenue adjacent to the project site.

Off-street Automobile Parking Requirements

The *City of Oakland Municipal Code* sets minimum and maximum parking requirements. According to Section 17.116.060, the residential component of the project has a minimum required parking of 1.0 spaces per unit and no maximum required parking. According to Section 17.116.110, this parking requirement can be reduced by 10 percent for projects that provide off-site carshare spaces at the level described in Section 17.116.105. For projects with 200 to 400 multi-family units, Section 17.116.105 requires two carshare spaces. The project site plan identifies one car-share space in each of the four project garages, for a total of four car-share spaces, exceeding the minimum required by the Code.

For the retail component of the project, Section 17.116.80 does not require any off-street parking because the retail space is smaller than 10,000 square feet.

Table 6 presents the off-street automobile parking requirements for the proposed project, per City of Oakland Municipal Code. Overall, the project is required to provide a minimum of 379 off-street spaces. The proposed project would provide two-off street parking spaces for each townhome in an attached garage for each unit, exceeding the City minimum requirements. Parking for the apartment, work/live, and live/work components of the project would be provided in four garages for each of the project mixed-use buildings. The project proposes 273 parking spaces for the apartment, work/live, and live/work components of the project, corresponding to about 0.95 parking spaces per unit and exceeding the 254 spaces required by the City Code. Each project building would meet or exceed the minimum required parking. Consistent with Code Section 17.116.310, all parking spaces for the multi-family units would be leased separately from the cost of the dwelling units.

TABLE 6

AUTOMOBILE PARKING CODE REQUIREMENTS

Land Use	Size[1]	Minimum Required Off-Street Parking Supply	Provided Off-Street Parking Supply	Above Minimum?
Townhomes[2]	122 DU	122	244	**Yes**
Apartments, Work/Live, and Live/Work Units:[3]				
Parcel A	106 DU	95	106	**Yes**
Parcel B	86 DU	77	77	
Parcel C	34 DU	31	36	
Parcel D	60 DU	54	54	
Retail[4]	3.0 KSF	0	0	**Yes**
Total		**379**	**517**	**Yes**

1. DU = Dwelling Unit, KSF = 1,000 square feet
2. The City of Oakland off-street parking requirement for townhomes in the HBX-1 zone is a minimum of 1.0 spaces per unit (Section 17.116.060).
3. The City of Oakland off-street parking requirement for multi-family and work/live units in the HBX-1 zone is a minimum of 1.0 spaces per unit (Section 17.116.060). The minimum is reduced by 10 percent because the project would provide off-site carshare space (Section 17.116.110).
4. The City of Oakland does not have a minimum off-street parking requirement for Commercial Activities smaller than 10,000 square feet.

Source: Fehr & Peers, 2020.

Plug-In Electric Vehicle (PEV) Charging Infrastructure

Chapter 15.04 of the Oakland Municipal Code requires the project to provide PEV-ready and PEV-capable parking spaces in the four garages for each of the project mixed-use buildings. Based on the Municipal Code, minimum of ten percent of the parking spaces in each garage must be PEV-ready and a minimum 20 percent of the spaces in each garage must be PEV-capable. The current site-plan does not identify any PEV-ready or PEV-capable parking spaces on the site.

Recommendation 7: While not required to address a CEQA impact but required by the Oakland Municipal Code, the following should be considered as part of the final design for the project:

- Ensure that the Parcel A garage provides a minimum of 11 PEV-ready and 21 PEV-capable parking spaces
- Ensure that the Parcel B garage provides a minimum of 8 PEV-ready and 15 PEV-capable parking spaces
- Ensure that the Parcel C garage provides a minimum of 4 PEV-ready and 7 PEV-

capable parking spaces

- Ensure that the Parcel D garage provides a minimum of 6 PEV-ready and 11 PEV-capable parking spaces

On-Street Parking and Curb Use

Most streets currently provide unrestricted parking along both sides of the street in the vicinity of the project side. The project proposes on-street parking along both sides of Blake Dive and on one side of Tubman and Garner Drives, except where red curb or bulb-out would be installed.

Recommendation 8: While not required to address a CEQA impact, and at the discretion of City of Oakland staff, the following should be considered as part of the final design for the project:

- Designate at least 20 feet of curb on Blake Drive near the retail component of theproject as white loading zone for passenger pick-up/drop-off.

COLLISION ANALYSIS

A five-year history (January 1, 2012 to December 31, 2016) of collision data in the study area was obtained from the Statewide Integrated Traffic Records System (SWITRS) and evaluated for this collision analysis. **Table 7** summarizes the collision data by type and location, and **Table 8** summarizes the collision data by severity and location.

As shown in **Table 7**, forty-three collisions were reported in the study area during this five-year period. The most common collision types were rear-end and sideswipe (28 percent each). Pedestrians were involved in one (two percent) of the reported collisions. Of the forty-three reported collisions, twenty-seven (63 percent) resulted in injuries, and one (two percent) resulted in a fatality, as shown in **Table 8**. The fatality was a result of a broadside collision at the 98th Avenue/ San Leandro Street intersection, and alcohol was involved.

TABLE 7
SUMMARY OF COLLISIONS BY TYPE[1]

Location	Head -on	Sideswipe	Rear-End	Broadside	Hit Object	Pedestrian-Involved	Bicycle-Involved	Total
Intersection								
92nd Avenue/Ellington Way	0	1	0	0	0	0	0	1
92nd Avenue/San Leandro	0	0	0	0	1	0	0	1
98th Avenue/Blake Drive/Medford Avenue	0	1	1	0	0	0	0	2
98th Avenue/San Leandro Street	1	8	10	8	4	1	2	34
98th Avenue/ Armstrong Drive	0	1	0	0	0	0	0	1
Armstrong Drive/Tubman Drive	0	1	0	1	0	0	0	2
Roadway Segment								
San Leandro Street (between 92nd and 98th Avenues)	0	0	0	0	0	0	0	0
98th Avenue (between San Leandro Street and Blake Drive)	0	0	0	0	0	0	0	0
98th Avenue (between Blake and Armstrong Drives)	0	0	1	0	0	0	0	1
98th Avenue (between San Leandro and Pearmain Streets)	1	0	0	0	0	0	0	1
Dunbar and Armstrong Drives (between 98th Avenue and Tubman Drive)	0	0	0	0	0	0	0	0
Total	**2**	**12**	**12**	**9**	**5**	**1**	**2**	**43**

1. Based on SWITRS five-year collision data reported from January 1, 2012 to December 31, 2016.
Source: SWITRS, Fehr & Peers, 2019.

TABLE 8
SUMMARY OF COLLISION SEVERITY[1]

Location	Property Damage Only	Complaint of Pain	Injury (Other Visible)	Fatality Collisions	Total	Person-Injuries			
						Bike	Ped	Driver/ Passenger	Total
Intersection									
92nd Avenue/Ellington Way	1	0	0	0	1	0	0	0	0
92nd Avenue/San Leandro	1	0	0	0	1				
98th Avenue/Blake Drive/Medford Avenue	1	1	0	0	2	0	0	1	1
98th Avenue/San Leandro Street	20	11	2	1	34	2	1	20	23
98th Avenue/ Armstrong Drive	1	0	0	0	1	0	0	0	0
Armstrong Drive/Tubman Drive	0	2	0	0	2	0	0	2	2
Roadway Segment									
San Leandro Street (between 92nd and 98th Avenues)	0	0	0	0	0	0	0	0	0
98th Avenue (between San Leandro Street and Blake Drive)	0	1	0	0	1	0	0	1	1
98th Avenue (between Blake and Armstrong Drives)	0	0	0	0	0	0	0	0	0
98th Avenue (between San Leandro and Pearmain Streets)	1	0	0	0	1	0	0	0	0
Dunbar and Armstrong Drives (between 98th Avenue and Tubman Drive)	0	0	0	0	0	0	0	0	0
Total	**25**	**14**	**2**	**1**	**43**	**2**	**1**	**24**	**27**

1. Based on SWITRS five-year collision data reported from January 1, 2012 to December 31, 2016.
Source: SWITRS, Fehr & Peers, 2019.

The Highway Safety Manual (HSM, Predictive Method - Volume 2, Part C) provides a methodology to predict the number of collisions for intersections and street segments based on roadway and intersection characteristics like vehicle and pedestrian volumes, number of lanes, signal phasing, on-street parking, and number of driveways. **Table 9** presents the predicted collision frequencies for the six study intersections and five study segments using the HSM Predictive Method for Urban and Suburban Arterials and compares predicted collision frequencies to reported collision frequencies. **Appendix C** provides detailed predicted collision frequency calculation sheets based on the HSM methodology. Intersections or roadway segments with collision frequency greater than the predicted frequency should have their collision trends and potential roadway or intersection modifications evaluated in greater detail.

As shown in **Table 9**, all study locations have a lower reported collision frequency than predicted by HSM, except the 98th Avenue/San Leandro Street intersection, where the collision frequency exceeds the predicted rate by 2.4 collisions per year.

TABLE 9
PREDICTED AND ACTUAL COLLISION FREQUENCIES

Location	Predicted Collision Frequency[1] (per year)	Actual Collision Frequency[2] (per year)	Difference	Higher Than Predicted?
Intersection				
92nd Avenue/Ellington Way	0.2	0.2	0	No
98th Avenue/Blake Drive/ Medford Avenue	1.4	0.4	-1.0	No
98th Avenue/San Leandro Street	4.4	6.8	**+2.4**	**Yes**
Roadway Segment				
San Leandro Street (between 92nd and 98th Avenues)	4.5	0	-4.5	No
98th Avenue (between San Leandro Street and Blake Drive)	0.8	0.2	-0.6	No
98th Avenue (between Blake and Armstrong Drives)	0.7	0	-0.7	No
98th Avenue (between San Leandro and Pearmain Streets)	1.3	0.2	-1.1	No

1. Based on the Highway Safety Manual Predictive Method (Volume 2, Part C)
2. Based on five-year collision data reported from January 1, 2012 to December 31, 2016.

Source: Fehr & Peers, 2019

Most of the reported collisions at this intersection during the five-year study period were due to improper turning (28 percent) and unsafe speed (15 percent). Eighteen percent of collisions involved trucks. The two vehicle/bicycle collisions were between motor vehicles traveling on eastbound 98th Avenue or northbound San Leandro Street and bicyclist riding on the wrong side of road. The one vehicle/pedestrian collision involved a motor vehicle on northbound San Leandro Street. Each pedestrian and bicycle collision resulted in one injury and no fatality.

The thirty-four collisions reported at the 98th Avenue/San Leandro Street intersection varied in location and type with no discernable trends. As previously described, the intersection currently provides high-visibility crosswalks on all four approaches, diagonal curb ramps at all four corners, countdown signal heads for both directions of all crosswalks. Recommendation 3 would improve the intersection by potentially installing curb extensions and/or directional curb ramps all four intersection corners

Since there are no discernable trends in the collision data at the intersection, we do not recommend any additional modifications at the 98th Avenue/San Leandro Street intersection beyond the ones described above.

AT-GRADE RAILROAD CROSSING SAFETY EVALUATION

The City of Oakland's Standard Condition of Approval (SCA) #82 (Railroad Crossings) requires the preparation of a Diagnostic Review for projects located within a ¼-mile of an at-grade railroad crossing that generate substantial vehicle, bicyclist, and/or pedestrian traffic. This section of the memorandum describes the at-grade crossings in the vicinity of the project and recommends improvements that should be considered as part of the Diagnostic Review that will be prepared for the project.

Union Pacific Railroad Company (UP) owns and operates the railroad tracks adjacent to the west side of the project on the Canyon Sub, which primarily serve the local industrial uses. In the project vicinity, there are two at-grade crossings at 98th Avenue and 92nd Avenue, just east of San Leandro Street. The railroad tracks, located between the project site and San Leandro Street, are used for freight trains. The train operates at an average of fewer than one movement per day, with the maximum speed of 10 mph.

Figure 1 shows the location of the at-grade crossings in the project area vicinity; **Table 10** summarizes the characteristics of these crossings, which are public at-grade crossings with gate controls for the vehicular approaches. Other characteristics are noted below:

- The railroad crossing at 98th Avenue is identified as US DOT crossing inventory number 834275M. The crossing has uneven sidewalks that are discontinuous at the gate equipment. The crossing surface is poorly maintained. There are no truncated domes (detectable warning surfaces) for pedestrians.
- The railroad crossing at 92nd Avenue is identified as US DOT crossing inventory number 834273Y. The crossing has uneven sidewalks that are discontinuous on one side of the gate equipment and covered by vegetation on the other side. The gate equipment is located in the crossing path. The crossing surface is poorly maintained and there are no truncated domes for pedestrians.

The accident/incident reports collected by the Federal Railroad Administration for at-grade railroad report no collisions at the two study at-grade railroad crossings in the last ten years.

The following recommendations are provided to further enhance the two at-grade railroad crossings near the project site:

Recommendation 9: While not required to address a CEQA impact but required by the City of Oakland's Standard Condition of Approval (SCA) #82 (Railroad Crossings), and at the discretion of City of Oakland staff, the following should be considered as part of the Diagnostic Review required for the project if the existing railroad tracks east of San Leandro Street are not abandoned:

- If determined feasible by City staff, improve paving surface at the 98th Avenue railroad crossing to provide smooth travel path. Construct ADA compliant sidewalks with detectable edges (truncated domes) to enhance safety. Ensure sidewalk widths are adequate and gate equipment does not impede travel path.
- If determined feasible by City staff, improve paving surface at the 92nd Avenue railroad crossing to provide smooth travel path. Construct ADA complaint sidewalks with truncated domes to enhance pedestrian safety. Ensure sidewalk widths are adequate and gate equipment does not impede travel path. Install advanced railroad crossing warning sign W10-1 (railroad crossing warning sign) on 92nd Avenue.
- If determined feasible by City staff, install W10-2 signs (parallel railroad crossing at an intersection warning sign) on both directions of San Leandro Street approaching the at-grade crossings on 92 and 98th Avenues.

Any proposed improvements must be coordinated with California Public Utility Commission (CPUC) and affected railroads and all necessary permits/approvals obtained, including a GO 88-B Request (Authorization to Alter Highway Rail Crossings).

TABLE 10

AT-GRADE RAILROAD CROSSING INVENTORY

Location	Train Crossing Speed (MPH)	# of Train Tracks	# of Traffic Lanes Crossing Railroad	Traffic Control Devices						
				Advance Warning	Pavement Markings	Train Signals	Bells	Gates	Four Quadrant Gates	Overhead Warning Light
98th Avenue, east of San Leandro Street	5 to 10	1	5	W10-1	No	Yes	Yes	Yes	No	yes
92nd Avenue, east of San Leandro Street	5 to 10	2	2	No	No	Yes	Yes	Yes	No	No

Source: Federal Railroad Administration Office of Safety Analysis, Crossing Inventory and Accidents Reports, accessed in March 2019.

Please contact Sam Tabibnia (s.tabibnia@fehrandpeers.com or 510-835-1943) with questions or comments.

ATTACHMENTS

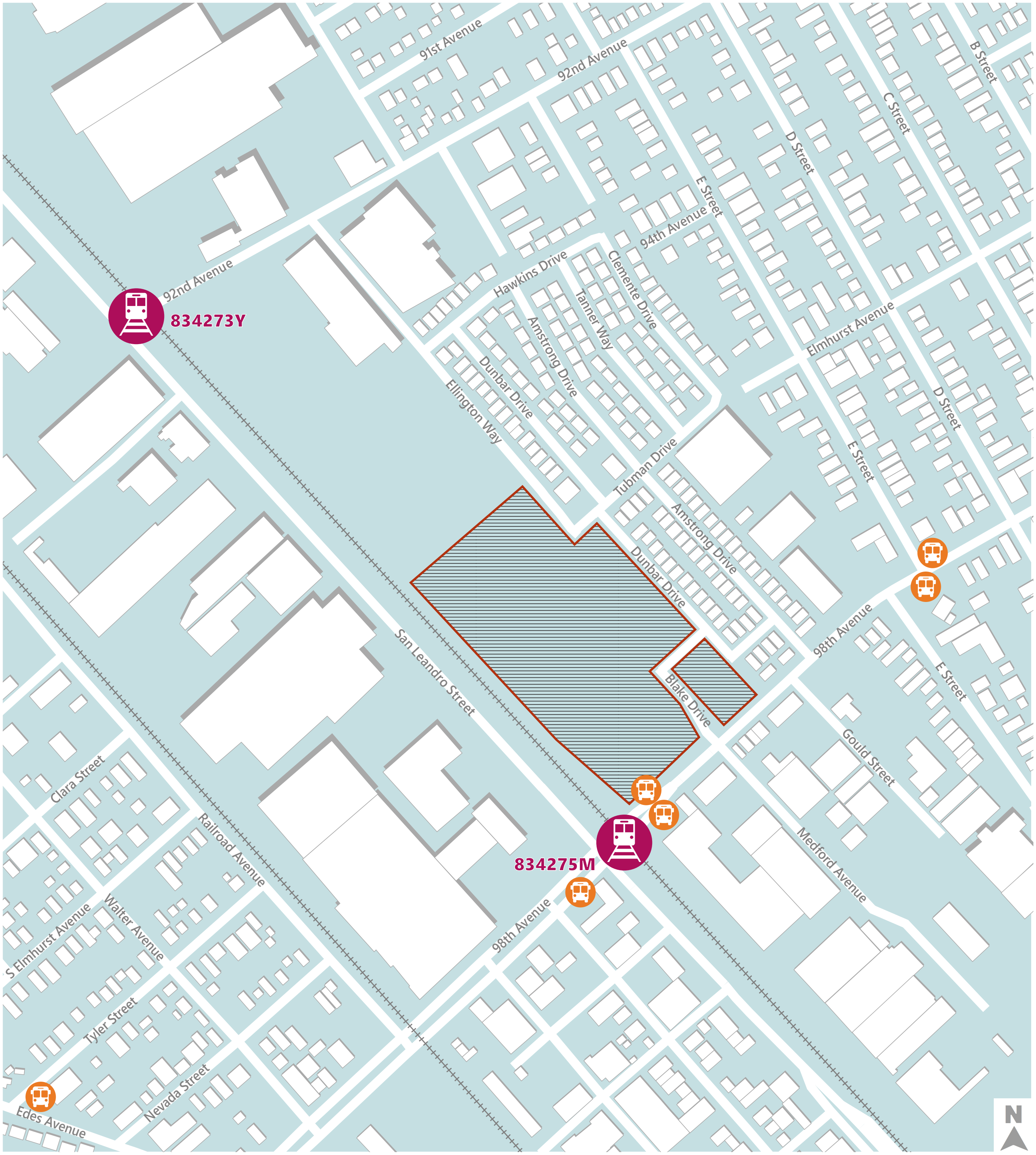
Figure 1 – Project Site

Figure 2 – Existing and Existing Plus Project Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

Appendix A – Traffic Counts

Appendix B – Intersection Operations Worksheets

Appendix C – Predicted Crash Frequency Calculation



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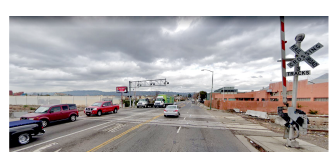
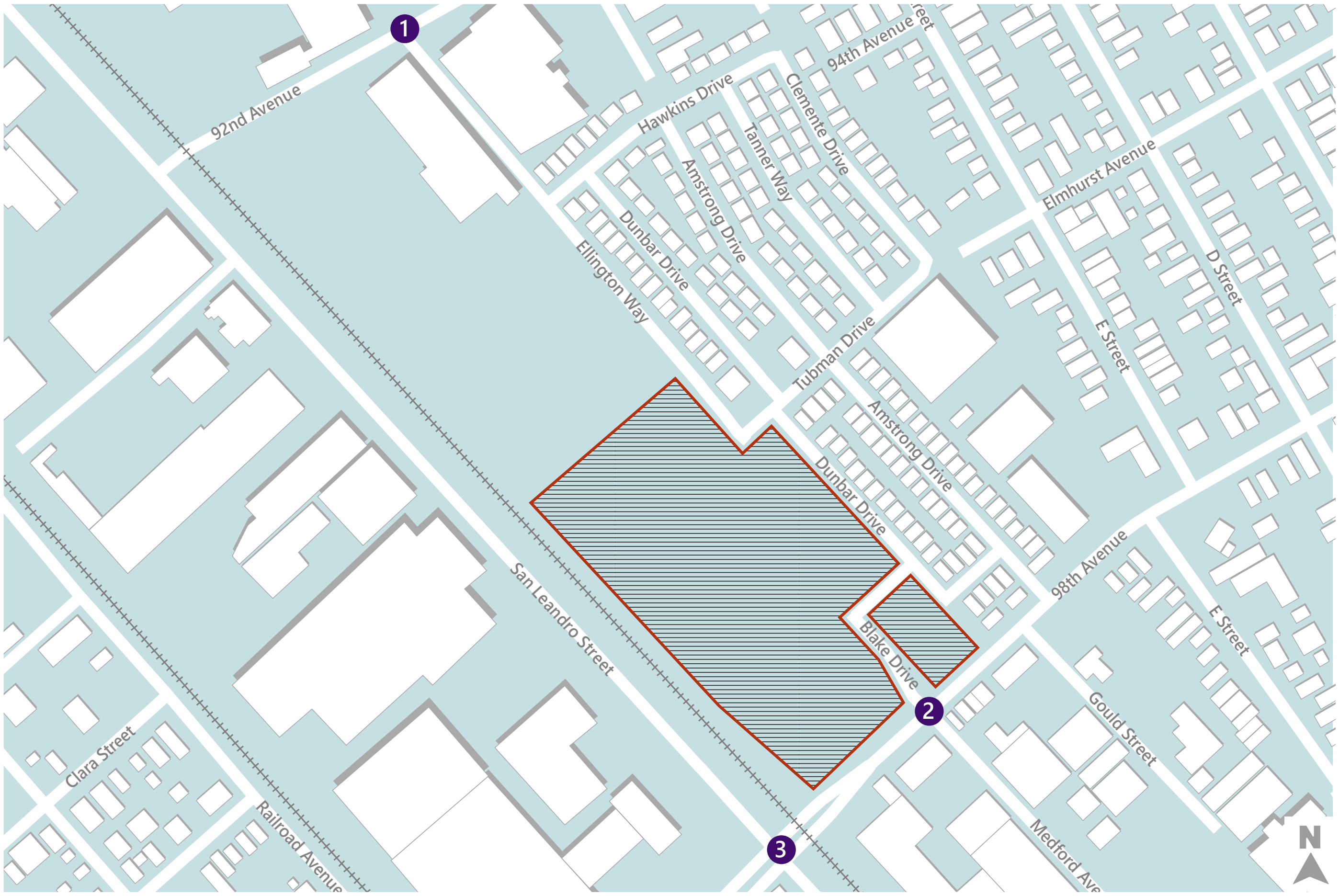
Railroad
Project Site
Bus Stop
At-Grade Railroad Crossing


834275M

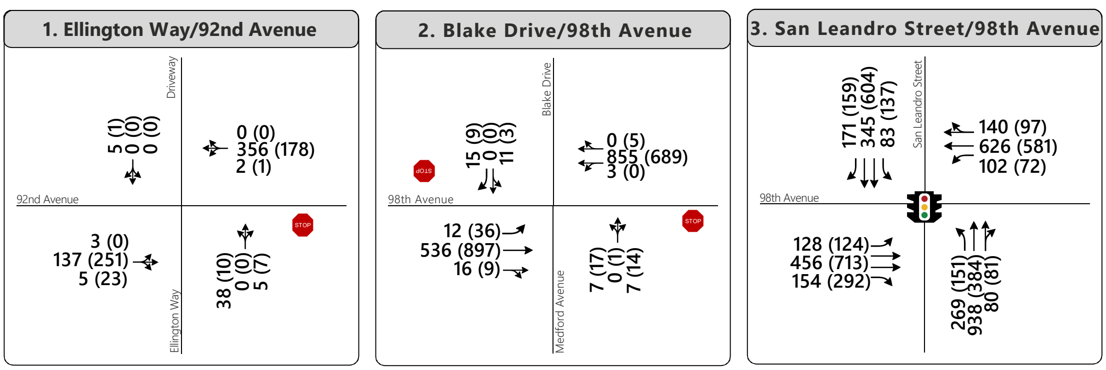

834273Y

Project Site

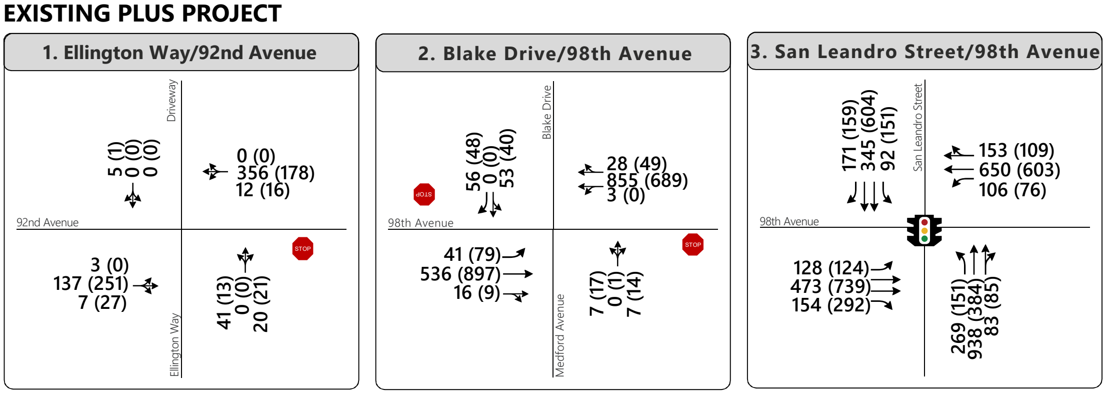
Figure 1



EXISTING CONDITIONS



EXISTING PLUS PROJECT



Railroad

Project Site

Study Intersection

Existing and Existing Plus Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Constrols

Figure 2

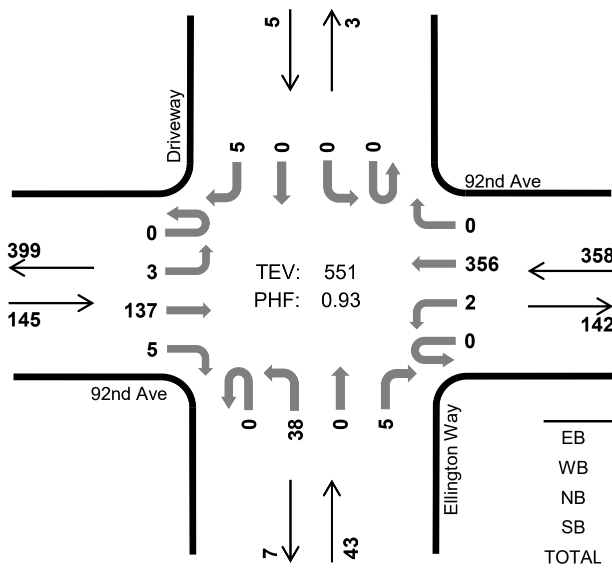
APPENDIX A

TRAFFIC COUNTS

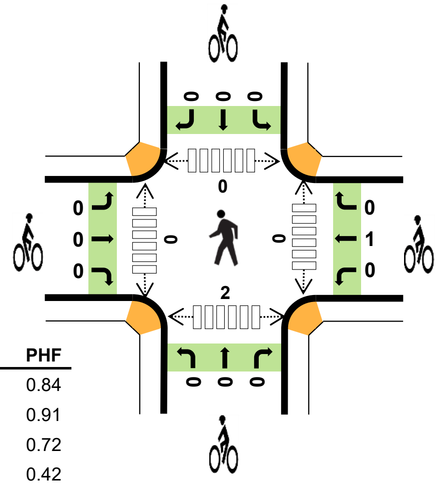
Ellington Way
92nd Ave

Date: 01/24/2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

Peak Hour



	HV %:	PHF
EB	7.6%	0.84
WB	2.5%	0.91
NB	0.0%	0.72
SB	60.0%	0.42
TOTAL	4.2%	0.93



Two-Hour Count Summaries

Interval Start		92nd Ave Eastbound				92nd Ave Westbound				Ellington Way Northbound				Driveway Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	1	17	1	0	1	47	0	0	5	0	0	0	0	0	0	72	0
7:15 AM		0	1	20	0	0	1	66	0	0	5	0	4	0	0	0	0	97	0
7:30 AM		**0**	**2**	**21**	**1**	**0**	**0**	**89**	**0**	**0**	**14**	**0**	**1**	**0**	**0**	**0**	**3**	**131**	0
7:45 AM		**0**	**1**	**37**	**0**	**0**	**0**	**98**	**0**	**0**	**9**	**0**	**1**	**0**	**0**	**0**	**2**	**148**	448
8:00 AM		**0**	**0**	**38**	**2**	**0**	**0**	**96**	**0**	**0**	**10**	**0**	**1**	**0**	**0**	**0**	**0**	**147**	523
8:15 AM		**0**	**0**	**41**	**2**	**0**	**2**	**73**	**0**	**0**	**5**	**0**	**2**	**0**	**0**	**0**	**0**	**125**	**551**
8:30 AM		0	0	38	3	0	0	51	0	0	7	0	2	0	0	0	0	101	521
8:45 AM		0	1	26	2	0	2	42	0	0	2	0	2	0	0	0	0	77	450
Count Total		0	6	238	11	0	6	562	0	0	57	0	13	0	0	0	5	898	0
Peak Hour	**All**	**0**	**3**	**137**	**5**	**0**	**2**	**356**	**0**	**0**	**38**	**0**	**5**	**0**	**0**	**0**	**5**	**551**	**0**
	HV	**0**	**2**	**9**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**23**	**0**
	HV%	**-**	**67%**	**7%**	**0%**	**-**	**0%**	**3%**	**-**	**-**	**0%**	**-**	**0%**	**-**	**-**	**-**	**60%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	3	0	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	2	3	1	0	*6*	0	0	1	0	*1*	0	0	0	0	*0*
7:30 AM	**6**	**3**	**0**	**3**	***12***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**2**	**1**	**0**	**0**	***3***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**2**	**3**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**1**	**2**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**2**	***2***
8:30 AM	3	3	0	0	*6*	0	0	0	0	*0*	0	0	1	1	*2*
8:45 AM	9	1	0	0	*10*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	27	19	1	3	*50*	0	1	1	0	*2*	0	0	1	3	*4*
Peak Hour	**11**	**9**	**0**	**3**	***23***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**2**	***2***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	92nd Ave				92nd Ave				Ellington Way				Driveway				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	1	0	0	0	3	0	0	0	0	0	0	0	0	0	5	0
7:15 AM	0	0	2	0	0	1	2	0	0	0	0	1	0	0	0	0	6	0
7:30 AM	**0**	**2**	**4**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**12**	0
7:45 AM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	26
8:00 AM	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	26
8:15 AM	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**23**
8:30 AM	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	6	17
8:45 AM	0	0	9	0	0	0	1	0	0	0	0	0	0	0	0	0	10	24
Count Total	0	3	24	0	0	1	18	0	0	0	0	1	0	0	0	3	50	0
Peak Hour	**0**	**2**	**9**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**23**	**0**

Two-Hour Count Summaries - Bikes

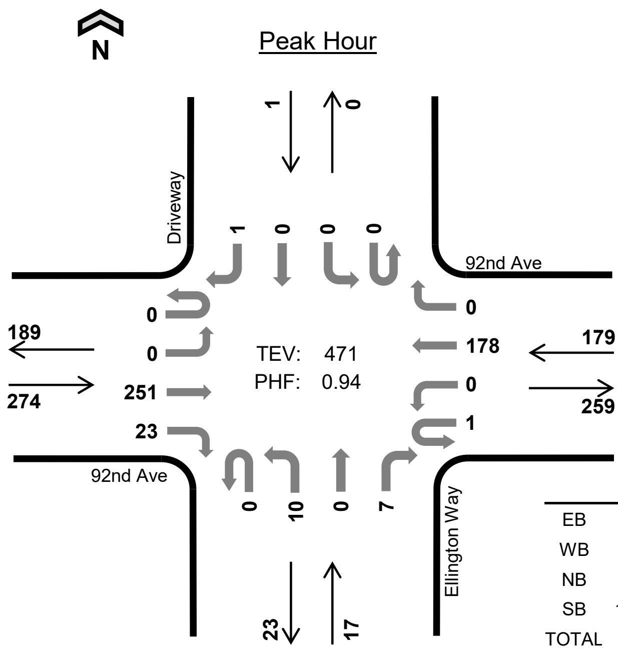
Interval Start	92nd Ave			92nd Ave			Ellington Way			Driveway			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	1	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	2
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	1	0	1	0	0	0	0	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

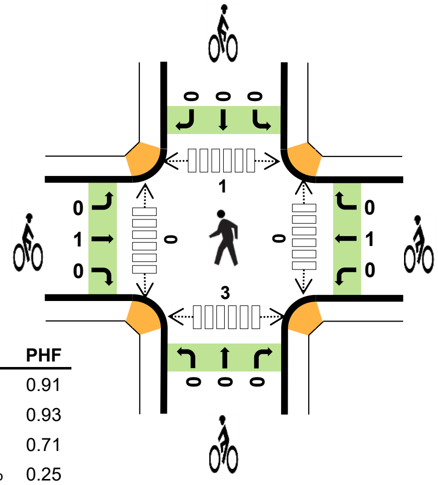
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Ellington Way
92nd Ave

Date: 01/24/2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

Peak Hour





	HV %:	PHF
EB	1.1%	0.91
WB	1.7%	0.93
NB	5.9%	0.71
SB	100.0%	0.25
TOTAL	1.7%	0.94

Two-Hour Count Summaries

Interval Start		92nd Ave Eastbound				92nd Ave Westbound				Ellington Way Northbound				Driveway Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	1	61	1	1	0	48	0	0	1	0	3	0	0	0	0	116	0
4:15 PM		0	0	60	4	0	2	42	0	0	5	0	1	0	0	0	0	114	0
4:30 PM		0	0	68	2	0	1	41	0	0	3	0	0	0	0	0	1	116	0
4:45 PM		0	0	71	1	0	2	38	0	0	0	0	3	0	0	0	0	115	461
5:00 PM		**0**	**0**	**67**	**4**	**1**	**0**	**45**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**119**	464
5:15 PM		**0**	**0**	**50**	**7**	**0**	**0**	**46**	**0**	**0**	**1**	**0**	**4**	**0**	**0**	**0**	**0**	**108**	458
5:30 PM		**0**	**0**	**63**	**8**	**0**	**0**	**48**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**125**	467
5:45 PM		**0**	**0**	**71**	**4**	**0**	**0**	**39**	**0**	**0**	**3**	**0**	**2**	**0**	**0**	**0**	**0**	**119**	**471**
Count Total		0	1	511	31	2	5	347	0	0	19	0	14	0	0	0	2	932	0
Peak Hour	**All**	**0**	**0**	**251**	**23**	**1**	**0**	**178**	**0**	**0**	**10**	**0**	**7**	**0**	**0**	**0**	**1**	**471**	**0**
	HV	**0**	**0**	**3**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**8**	**0**
	HV%	**-**	**-**	**1%**	**0%**	**0%**	**-**	**2%**	**-**	**-**	**0%**	**-**	**14%**	**-**	**-**	**-**	**100%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	4	0	0	*7*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	2	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	1	0	1	*2*	1	0	0	0	*1*	0	0	0	0	*0*
4:45 PM	2	2	0	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
5:00 PM	**2**	**1**	**0**	**1**	*4*	**0**	**0**	**0**	**0**	*0*	**0**	**0**	**1**	**3**	*4*
5:15 PM	**1**	**0**	**1**	**0**	*2*	**1**	**0**	**0**	**0**	*1*	**0**	**0**	**0**	**0**	*0*
5:30 PM	**0**	**1**	**0**	**0**	*1*	**0**	**1**	**0**	**0**	*1*	**0**	**0**	**0**	**0**	*0*
5:45 PM	**0**	**1**	**0**	**0**	*1*	**0**	**0**	**0**	**0**	*0*	**0**	**0**	**0**	**0**	*0*
Count Total	8	12	1	2	*23*	2	1	0	0	*3*	0	0	1	3	*4*
Peak Hour	**3**	**3**	**1**	**1**	***8***	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**1**	**3**	***4***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	92nd Ave				92nd Ave				Ellington Way				Driveway				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	2	0	0	0	4	0	0	0	0	0	0	0	0	0	7	0
4:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0
4:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2	0
4:45 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	4	15
5:00 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	12
5:15 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	12
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	11
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**8**
Count Total	0	1	7	0	0	0	12	0	0	0	0	1	0	0	0	2	23	0
Peak Hour	**0**	**0**	**3**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**8**	**0**

Two-Hour Count Summaries - Bikes

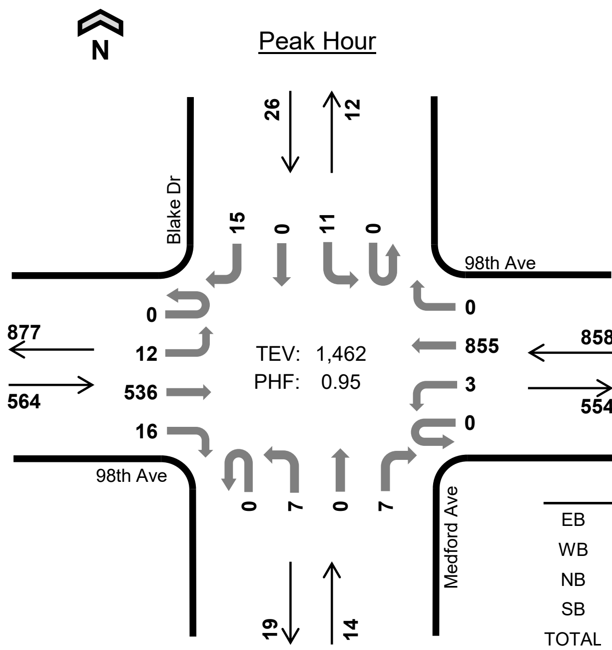
Interval Start	92nd Ave			92nd Ave			Ellington Way			Driveway			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:15 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	2
5:30 PM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	2
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Count Total	0	2	0	0	1	0	0	0	0	0	0	0	3	0
Peak Hour	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**

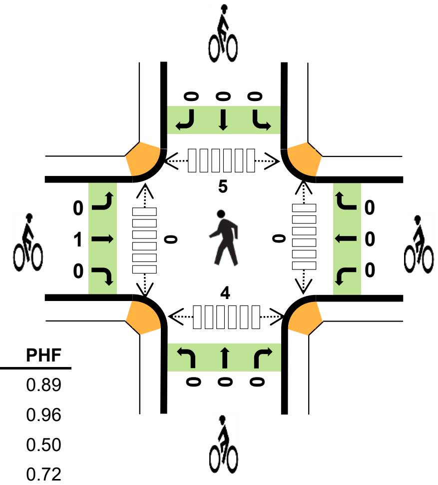
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Blake Dr
98th Ave

Date: 01/29/2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

Peak Hour





	HV %:	PHF
EB	4.4%	0.89
WB	3.3%	0.96
NB	14.3%	0.50
SB	0.0%	0.72
TOTAL	3.8%	0.95

Two-Hour Count Summaries

Interval Start	98th Ave Eastbound				98th Ave Westbound				Medford Ave Northbound				Blake Dr Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	83	7	0	3	165	0	0	4	0	2	0	6	2	5	278	0
7:15 AM	1	1	101	4	0	0	195	0	0	7	0	2	0	5	0	4	320	0
7:30 AM	**0**	**1**	**120**	**4**	**0**	**1**	**223**	**0**	**0**	**3**	**0**	**4**	**0**	**5**	**0**	**4**	**365**	0
7:45 AM	**0**	**1**	**125**	**1**	**0**	**0**	**217**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**4**	**350**	1,313
8:00 AM	**0**	**2**	**147**	**4**	**0**	**2**	**218**	**0**	**0**	**3**	**0**	**2**	**0**	**3**	**0**	**4**	**385**	1,420
8:15 AM	**0**	**8**	**144**	**7**	**0**	**0**	**197**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**3**	**362**	**1,462**
8:30 AM	0	6	115	8	0	0	176	0	0	2	1	1	0	1	0	4	314	1,411
8:45 AM	0	4	116	6	0	2	194	0	0	2	0	2	0	3	0	2	331	1,392
Count Total	1	24	951	41	0	8	1,585	0	0	22	1	14	0	26	2	30	2,705	0
Peak Hour All	**0**	**12**	**536**	**16**	**0**	**3**	**855**	**0**	**0**	**7**	**0**	**7**	**0**	**11**	**0**	**15**	**1,462**	**0**
Peak Hour HV	**0**	**0**	**23**	**2**	**0**	**0**	**28**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**55**	**0**
Peak Hour HV%	**-**	**0%**	**4%**	**13%**	**-**	**0%**	**3%**	**-**	**-**	**29%**	**-**	**0%**	**-**	**0%**	**-**	**0%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	6	5	1	0	*12*	0	0	0	0	*0*	0	0	2	2	*4*
7:15 AM	9	6	1	0	*16*	0	0	0	0	*0*	0	1	0	1	*2*
7:30 AM	**7**	**7**	**2**	**0**	***16***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**1**	*2*
7:45 AM	**6**	**9**	**0**	**0**	***15***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**2**	**1**	*3*
8:00 AM	**5**	**4**	**0**	**0**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
8:15 AM	**7**	**8**	**0**	**0**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**1**	***3***
8:30 AM	10	8	1	0	*19*	0	0	0	0	*0*	0	0	1	2	*3*
8:45 AM	11	9	2	0	*22*	0	0	0	0	*0*	0	0	4	0	*4*
Count Total	61	56	7	0	*124*	1	0	0	0	*1*	0	1	12	9	*22*
Peak Hour	**25**	**28**	**2**	**0**	***55***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**5**	**4**	***9***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	98th Ave				98th Ave				Medford Ave				Blake Dr				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	6	0	0	0	5	0	0	1	0	0	0	0	0	0	12	0
7:15 AM	1	0	8	0	0	0	6	0	0	1	0	0	0	0	0	0	16	0
7:30 AM	**0**	**0**	**7**	**0**	**0**	**0**	**7**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	0
7:45 AM	**0**	**0**	**6**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**15**	59
8:00 AM	**0**	**0**	**4**	**1**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	56
8:15 AM	**0**	**0**	**6**	**1**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**15**	**55**
8:30 AM	0	0	7	3	0	0	8	0	0	1	0	0	0	0	0	0	19	58
8:45 AM	0	0	8	3	0	0	9	0	0	0	0	2	0	0	0	0	22	65
Count Total	1	0	52	8	0	0	56	0	0	5	0	2	0	0	0	0	124	0
Peak Hour	**0**	**0**	**23**	**2**	**0**	**0**	**28**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**55**	**0**

Two-Hour Count Summaries - Bikes

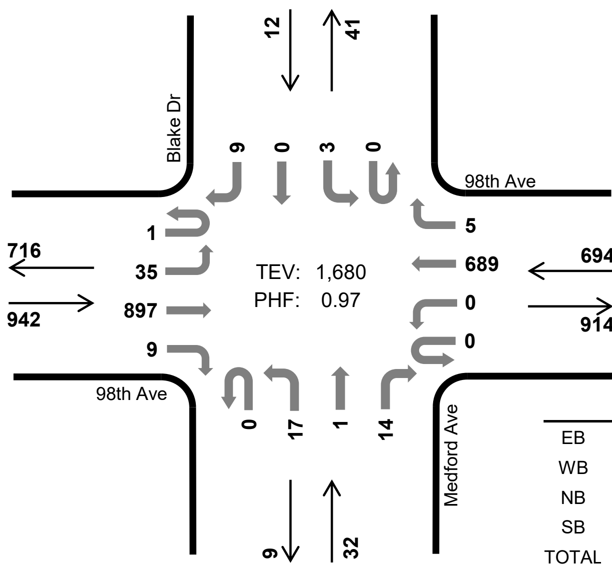
Interval Start	98th Ave			98th Ave			Medford Ave			Blake Dr			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	1
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Peak Hour	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

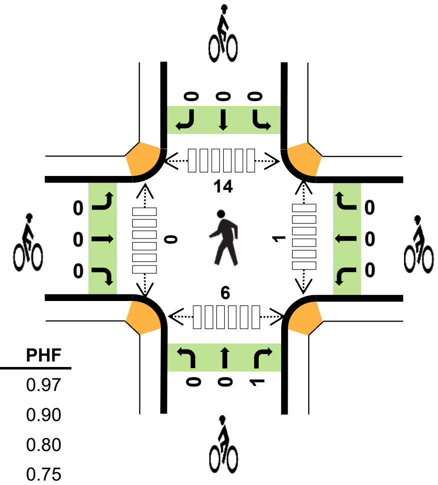
Blake Dr
98th Ave

Date: 01/29/2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

Peak Hour



	HV %:	PHF
EB	1.2%	0.97
WB	2.4%	0.90
NB	12.5%	0.80
SB	0.0%	0.75
TOTAL	1.9%	0.97



Two-Hour Count Summaries

Interval Start	98th Ave Eastbound UT	LT	TH	RT	98th Ave Westbound UT	LT	TH	RT	Medford Ave Northbound UT	LT	TH	RT	Blake Dr Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	7	208	6	0	4	178	0	0	20	0	6	0	0	0	6	435	0
4:15 PM	0	6	216	2	1	1	152	1	0	4	0	3	0	3	0	0	389	0
4:30 PM	0	5	205	3	0	2	151	0	0	7	0	2	0	0	0	1	376	0
4:45 PM	**1**	**11**	**226**	**6**	**0**	**0**	**166**	**0**	**0**	**3**	**0**	**4**	**0**	**0**	**0**	**2**	**419**	1,619
5:00 PM	**0**	**8**	**222**	**0**	**0**	**0**	**191**	**2**	**0**	**7**	**0**	**3**	**0**	**1**	**0**	**1**	**435**	1,619
5:15 PM	**0**	**6**	**235**	**1**	**0**	**0**	**170**	**2**	**0**	**2**	**0**	**3**	**0**	**1**	**0**	**3**	**423**	1,653
5:30 PM	**0**	**10**	**214**	**2**	**0**	**0**	**162**	**1**	**0**	**5**	**1**	**4**	**0**	**1**	**0**	**3**	**403**	**1,680**
5:45 PM	1	10	217	4	0	2	161	0	0	2	0	1	0	1	0	3	402	1,663
Count Total	2	63	1,743	24	1	9	1,331	6	0	50	1	26	0	7	0	19	3,282	0
Peak Hour All	**1**	**35**	**897**	**9**	**0**	**0**	**689**	**5**	**0**	**17**	**1**	**14**	**0**	**3**	**0**	**9**	**1,680**	**0**
Peak Hour HV	**0**	**0**	**9**	**2**	**0**	**0**	**17**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**32**	**0**
Peak Hour HV%	**0%**	**0%**	**1%**	**22%**	**-**	**-**	**2%**	**0%**	**-**	**18%**	**0%**	**7%**	**-**	**0%**	**-**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	5	5	1	0	*11*	0	0	0	1	*1*	0	1	3	2	*6*
4:15 PM	2	3	0	0	*5*	0	0	0	0	*0*	0	0	1	2	*3*
4:30 PM	3	1	0	0	*4*	0	0	0	0	*0*	0	0	1	2	*3*
4:45 PM	**5**	**5**	**1**	**0**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**1**	*3*
5:00 PM	**2**	**4**	**1**	**0**	***7***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**4**	**1**	*5*
5:15 PM	**3**	**5**	**2**	**0**	***10***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**3**	**2**	*6*
5:30 PM	**1**	**3**	**0**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**5**	**2**	*7*
5:45 PM	3	3	0	1	*7*	0	0	0	0	*0*	0	0	3	0	*3*
Count Total	24	29	5	1	*59*	0	0	1	1	*2*	1	1	22	12	*36*
Peak Hour	**11**	**17**	**4**	**0**	***32***	**0**	**0**	**1**	**0**	***1***	**1**	**0**	**14**	**6**	***21***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	98th Ave				98th Ave				Medford Ave				Blake Dr				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	4	1	0	0	5	0	0	1	0	0	0	0	0	0	11	0
4:15 PM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	5	0
4:30 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	4	0
4:45 PM	**0**	**0**	**3**	**2**	**0**	**0**	**5**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	31
5:00 PM	**0**	**0**	**2**	**0**	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	27
5:15 PM	**0**	**0**	**3**	**0**	**0**	**0**	**5**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**10**	32
5:30 PM	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**32**
5:45 PM	0	0	2	1	0	0	3	0	0	0	0	0	0	0	0	1	7	28
Count Total	0	0	20	4	0	0	29	0	0	4	0	1	0	0	0	1	59	0
Peak Hour	**0**	**0**	**9**	**2**	**0**	**0**	**17**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**32**	**0**

Two-Hour Count Summaries - Bikes

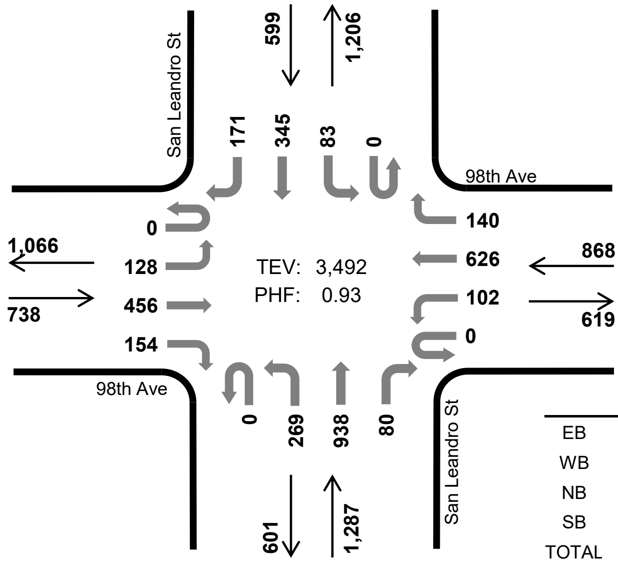
Interval Start	98th Ave			98th Ave			Medford Ave			Blake Dr			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	1
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	0	0	0	0	0	0	1	0	0	1	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

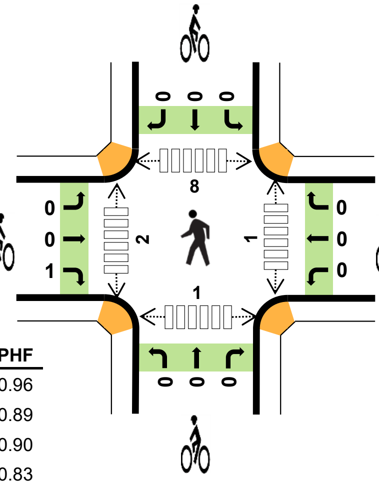
San Leandro St
98th Ave

Date: 01/24/2019
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour



	HV %:	PHF
EB	5.8%	0.96
WB	3.7%	0.89
NB	1.2%	0.90
SB	5.5%	0.83
TOTAL	3.5%	0.93



Two-Hour Count Summaries

Interval Start	98th Ave Eastbound				98th Ave Westbound				San Leandro St Northbound				San Leandro St Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	23	60	15	0	15	145	30	1	43	72	9	0	9	44	35	501	0
7:15 AM	0	21	90	28	0	16	147	40	0	50	102	9	0	6	43	54	606	0
7:30 AM	0	27	95	26	0	25	133	28	0	64	184	12	0	9	65	49	717	0
7:45 AM	**0**	**24**	**105**	**49**	**0**	**31**	**171**	**43**	**0**	**73**	**239**	**22**	**0**	**23**	**114**	**44**	**938**	2,762
8:00 AM	**0**	**28**	**127**	**35**	**0**	**28**	**157**	**33**	**0**	**60**	**206**	**19**	**0**	**31**	**71**	**43**	**838**	3,099
8:15 AM	**0**	**39**	**116**	**38**	**0**	**19**	**159**	**26**	**0**	**67**	**270**	**19**	**0**	**18**	**93**	**48**	**912**	3,405
8:30 AM	**0**	**37**	**108**	**32**	**0**	**24**	**139**	**38**	**0**	**69**	**223**	**20**	**0**	**11**	**67**	**36**	**804**	**3,492**
8:45 AM	0	33	117	38	0	20	155	32	0	42	168	11	0	26	70	36	748	3,302
Count Total	0	232	818	261	0	178	1,206	270	1	468	1,464	121	0	133	567	345	6,064	0
Peak Hour All	**0**	**128**	**456**	**154**	**0**	**102**	**626**	**140**	**0**	**269**	**938**	**80**	**0**	**83**	**345**	**171**	**3,492**	**0**
Peak Hour HV	**0**	**20**	**21**	**2**	**0**	**2**	**25**	**5**	**0**	**4**	**10**	**1**	**0**	**2**	**4**	**27**	**123**	**0**
Peak Hour HV%	**-**	**16%**	**5%**	**1%**	**-**	**2%**	**4%**	**4%**	**-**	**1%**	**1%**	**1%**	**-**	**2%**	**1%**	**16%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	6	8	3	13	*30*	0	0	0	0	*0*	0	0	1	2	*3*
7:15 AM	17	6	3	11	*37*	0	0	0	0	*0*	1	0	1	2	*4*
7:30 AM	8	7	4	10	*29*	0	0	0	0	*0*	0	0	2	0	*2*
7:45 AM	**8**	**8**	**3**	**6**	***25***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**3**	**0**	*5*
8:00 AM	**12**	**9**	**3**	**8**	***32***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**3**	**0**	*3*
8:15 AM	**7**	**4**	**5**	**11**	***27***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**1**	*2*
8:30 AM	**16**	**11**	**4**	**8**	***39***	**1**	**0**	**0**	**0**	***1***	**1**	**0**	**1**	**0**	*2*
8:45 AM	14	4	6	8	*32*	0	0	0	0	*0*	0	0	3	0	*3*
Count Total	88	57	31	75	*251*	1	0	0	0	*1*	2	2	15	5	*24*
Peak Hour	**43**	**32**	**15**	**33**	***123***	**1**	**0**	**0**	**0**	***1***	**1**	**2**	**8**	**1**	***12***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	98th Ave				98th Ave				San Leandro St				San Leandro St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	3	3	0	0	0	8	0	0	0	2	1	0	2	2	9	30	0
7:15 AM	0	3	11	3	0	0	3	3	0	0	3	0	0	0	1	10	37	0
7:30 AM	0	0	6	2	0	0	6	1	0	1	3	0	0	1	0	9	29	0
7:45 AM	**0**	**4**	**4**	**0**	**0**	**1**	**6**	**1**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**6**	**25**	121
8:00 AM	**0**	**6**	**6**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**1**	**6**	**32**	123
8:15 AM	**0**	**3**	**3**	**1**	**0**	**0**	**4**	**0**	**0**	**2**	**3**	**0**	**0**	**1**	**1**	**9**	**27**	113
8:30 AM	**0**	**7**	**8**	**1**	**0**	**1**	**6**	**4**	**0**	**1**	**2**	**1**	**0**	**0**	**2**	**6**	**39**	**123**
8:45 AM	0	8	5	1	0	1	1	2	0	1	5	0	0	1	0	7	32	130
Count Total	0	34	46	8	0	3	43	11	0	6	23	2	0	6	7	62	251	0
Peak Hour	**0**	**20**	**21**	**2**	**0**	**2**	**25**	**5**	**0**	**4**	**10**	**1**	**0**	**2**	**4**	**27**	**123**	**0**

Two-Hour Count Summaries - Bikes

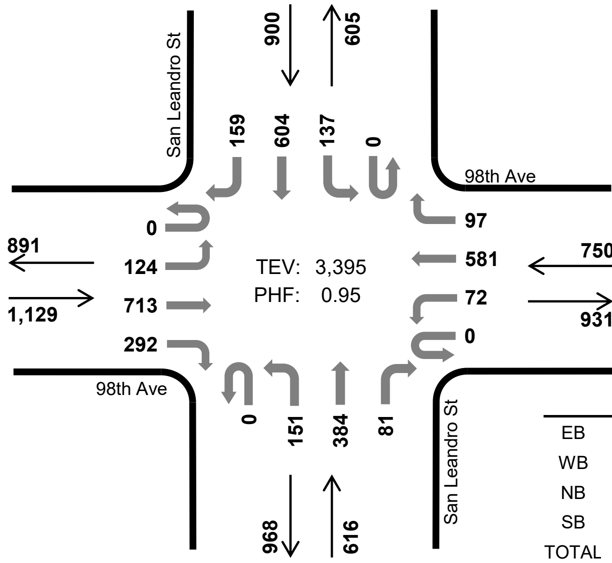
Interval Start	98th Ave			98th Ave			San Leandro St			San Leandro St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:30 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

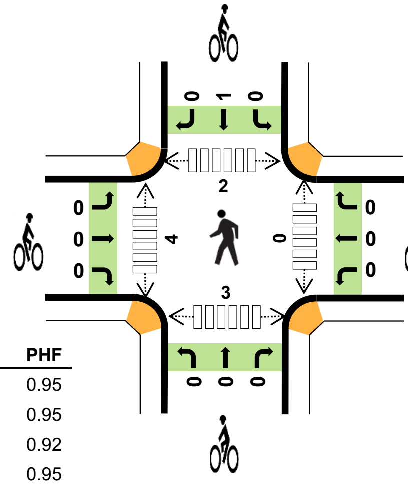
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

San Leandro St
98th Ave

Date:	01/24/2019
Count Period:	4:00 PM to 6:00 PM
Peak Hour:	5:00 PM to 6:00 PM

Peak Hour





	HV %:	PHF
EB	1.2%	0.95
WB	2.4%	0.95
NB	1.0%	0.92
SB	0.9%	0.95
TOTAL	1.4%	0.95

Two-Hour Count Summaries

Interval Start		98th Ave Eastbound UT	LT	TH	RT	98th Ave Westbound UT	LT	TH	RT	San Leandro St Northbound UT	LT	TH	RT	San Leandro St Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM		0	29	200	62	0	26	146	26	0	29	105	24	0	35	142	32	856	0
4:15 PM		0	26	168	69	0	15	148	31	0	36	72	15	0	34	110	28	752	0
4:30 PM		0	40	182	61	0	20	139	23	0	34	105	12	0	31	161	43	851	0
4:45 PM		0	23	174	67	0	27	142	28	0	49	101	13	0	45	120	33	822	3,281
5:00 PM		**0**	**29**	**178**	**75**	**0**	**15**	**125**	**25**	**0**	**38**	**104**	**26**	**0**	**24**	**162**	**34**	**835**	3,260
5:15 PM		**0**	**32**	**165**	**84**	**0**	**19**	**151**	**28**	**0**	**39**	**74**	**20**	**0**	**45**	**141**	**43**	**841**	3,349
5:30 PM		**0**	**27**	**191**	**78**	**0**	**19**	**149**	**25**	**0**	**34**	**116**	**17**	**0**	**38**	**162**	**38**	**894**	3,392
5:45 PM		**0**	**36**	**179**	**55**	**0**	**19**	**156**	**19**	**0**	**40**	**90**	**18**	**0**	**30**	**139**	**44**	**825**	**3,395**
Count Total		0	242	1,437	551	0	160	1,156	205	0	299	767	145	0	282	1,137	295	6,676	0
Peak Hour	**All**	**0**	**124**	**713**	**292**	**0**	**72**	**581**	**97**	**0**	**151**	**384**	**81**	**0**	**137**	**604**	**159**	**3,395**	**0**
	HV	**0**	**6**	**6**	**2**	**0**	**0**	**15**	**3**	**0**	**2**	**4**	**0**	**0**	**3**	**0**	**5**	**46**	**0**
	HV%	**-**	**5%**	**1%**	**1%**	**-**	**0%**	**3%**	**3%**	**-**	**1%**	**1%**	**0%**	**-**	**2%**	**0%**	**3%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	7	6	2	6	*21*	0	0	0	0	*0*	0	0	1	6	*7*
4:15 PM	3	9	4	6	*22*	1	0	0	0	*1*	1	2	1	2	*6*
4:30 PM	8	6	2	5	*21*	0	0	0	0	*0*	2	2	3	7	*14*
4:45 PM	7	8	1	5	*21*	0	0	0	0	*0*	2	2	3	2	*9*
5:00 PM	**2**	**4**	**2**	**5**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
5:15 PM	**7**	**4**	**2**	**1**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**2**	*3*
5:30 PM	**3**	**6**	**2**	**1**	***12***	**0**	**0**	**0**	**1**	***1***	**0**	**2**	**0**	**1**	*3*
5:45 PM	**2**	**4**	**0**	**1**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**0**	*2*
Count Total	39	47	15	30	*131*	1	0	0	1	*2*	5	10	10	20	*45*
Peak Hour	**14**	**18**	**6**	**8**	***46***	**0**	**0**	**0**	**1**	***1***	**0**	**4**	**2**	**3**	***9***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	98th Ave Eastbound UT	LT	TH	RT	98th Ave Westbound UT	LT	TH	RT	San Leandro St Northbound UT	LT	TH	RT	San Leandro St Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	2	5	0	0	0	5	1	0	0	2	0	0	1	3	2	21	0
4:15 PM	0	1	2	0	0	0	9	0	0	1	3	0	0	0	3	3	22	0
4:30 PM	0	3	5	0	0	0	5	1	0	0	2	0	0	1	3	1	21	0
4:45 PM	0	1	4	2	0	2	4	2	0	0	1	0	0	2	0	3	21	85
5:00 PM	**0**	**1**	**1**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**4**	**13**	77
5:15 PM	**0**	**3**	**2**	**2**	**0**	**0**	**3**	**1**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**14**	69
5:30 PM	**0**	**1**	**2**	**0**	**0**	**0**	**5**	**1**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**12**	60
5:45 PM	**0**	**1**	**1**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**7**	**46**
Count Total	0	13	22	4	0	2	38	7	0	3	12	0	0	7	9	14	131	0
Peak Hour	**0**	**6**	**6**	**2**	**0**	**0**	**15**	**3**	**0**	**2**	**4**	**0**	**0**	**3**	**0**	**5**	**46**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	98th Ave Eastbound LT	TH	RT	98th Ave Westbound LT	TH	RT	San Leandro St Northbound LT	TH	RT	San Leandro St Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	1
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Count Total	0	1	0	0	0	0	0	0	0	0	1	0	2	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

APPENDIX B
INTERSECTION OPERATIONS
WORKSHEETS

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	137	5	2	356	0	38	0	5	0	0	5
Future Vol, veh/h	3	137	5	2	356	0	38	0	5	0	0	5
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	3	137	5	2	356	0	38	0	5	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	356	0	0	144	0	0	511	508	142	508	510	356
Stage 1	-	-	-	-	-	-	148	148	-	360	360	-
Stage 2	-	-	-	-	-	-	363	360	-	148	150	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1192	-	-	1426	-	-	470	465	900	472	464	684
Stage 1	-	-	-	-	-	-	850	771	-	654	623	-
Stage 2	-	-	-	-	-	-	652	623	-	850	769	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1192	-	-	1423	-	-	464	462	898	468	461	684
Mov Cap-2 Maneuver	-	-	-	-	-	-	464	462	-	468	461	-
Stage 1	-	-	-	-	-	-	846	767	-	652	622	-
Stage 2	-	-	-	-	-	-	646	622	-	843	765	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	13	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	492	1192	-	-	1423	-	-	684
HCM Lane V/C Ratio	0.087	0.003	-	-	0.001	-	-	0.007
HCM Control Delay (s)	13	8	0	-	7.5	0	-	10.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	536	16	3	855	0	7	0	7	11	0	15
Future Vol, veh/h	12	536	16	3	855	0	7	0	7	11	0	15
Conflicting Peds, #/hr	5	0	4	4	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	12	536	16	3	855	0	7	0	7	11	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	860	0	0	556	0	0	1006	1438	280	1158	1446	433
Stage 1	-	-	-	-	-	-	572	572	-	866	866	-
Stage 2	-	-	-	-	-	-	434	866	-	292	580	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.58	6.58	6.98	7.58	6.58	6.98
Critical Hdwy Stg 1	-	-	-	-	-	-	6.58	5.58	-	6.58	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.58	5.58	-	6.58	5.58	-
Follow-up Hdwy	2.24	-	-	2.24	-	-	3.54	4.04	3.34	3.54	4.04	3.34
Pot Cap-1 Maneuver	765	-	-	997	-	-	193	130	711	149	128	565
Stage 1	-	-	-	-	-	-	467	498	-	310	364	-
Stage 2	-	-	-	-	-	-	565	364	-	686	493	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	761	-	-	993	-	-	184	126	708	144	124	562
Mov Cap-2 Maneuver	-	-	-	-	-	-	184	126	-	144	124	-
Stage 1	-	-	-	-	-	-	458	488	-	304	360	-
Stage 2	-	-	-	-	-	-	547	360	-	669	483	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	17.9	11.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	292	761	-	-	993	-	-	-	562
HCM Lane V/C Ratio	0.048	0.016	-	-	0.003	-	-	-	0.027
HCM Control Delay (s)	17.9	9.8	-	-	8.6	0	-	0	11.6
HCM Lane LOS	C	A	-	-	A	A	-	A	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	456	154	102	626	140	269	938	80	83	345	171
Future Volume (veh/h)	128	456	154	102	626	140	269	938	80	83	345	171
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1827	1827	1827	1827	1827	1900	1827	1827	1900	1827	1827	1827
Adj Flow Rate, veh/h	128	456	154	102	626	140	269	938	80	83	345	171
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	154	949	421	128	728	163	217	963	82	326	1279	571
Arrive On Green	0.09	0.27	0.27	0.07	0.26	0.26	0.13	0.30	0.30	0.19	0.37	0.37
Sat Flow, veh/h	1740	3471	1539	1740	2816	629	1740	3237	276	1740	3471	1550
Grp Volume(v), veh/h	128	456	154	102	385	381	269	503	515	83	345	171
Grp Sat Flow(s),veh/h/ln	1740	1736	1539	1740	1736	1709	1740	1736	1778	1740	1736	1550
Q Serve(g_s), s	8.4	12.7	9.4	6.7	24.6	24.6	14.5	33.3	33.3	4.7	8.1	9.1
Cycle Q Clear(g_c), s	8.4	12.7	9.4	6.7	24.6	24.6	14.5	33.3	33.3	4.7	8.1	9.1
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	154	949	421	128	449	442	217	516	529	326	1279	571
V/C Ratio(X)	0.83	0.48	0.37	0.80	0.86	0.86	1.24	0.97	0.97	0.25	0.27	0.30
Avail Cap(c_a), veh/h	180	949	421	315	539	530	217	516	529	326	1279	571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	35.2	34.0	52.9	41.0	41.0	50.7	40.3	40.3	40.2	25.7	26.0
Incr Delay (d2), s/veh	23.9	0.4	0.5	10.7	11.5	11.9	139.6	33.7	33.3	0.4	0.5	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	6.1	4.1	3.6	13.2	13.1	15.4	20.8	21.2	2.3	4.0	4.1
LnGrp Delay(d),s/veh	75.9	35.6	34.5	63.6	52.4	52.9	190.3	74.0	73.6	40.6	26.2	27.3
LnGrp LOS	E	D	C	E	D	D	F	E	E	D	C	C
Approach Vol, veh/h		738			868			1287			599	
Approach Delay, s/veh		42.4			53.9			98.2			28.5	
Approach LOS		D			D			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.7	39.5	12.5	37.2	18.5	47.7	14.3	35.5
Change Period (Y+Rc), s	5.0	* 5	4.0	5.5	4.0	5.0	4.0	5.5
Max Green Setting (Gmax), s	15.0	* 35	21.0	27.0	14.5	35.0	12.0	36.0
Max Q Clear Time (g_c+I1), s	6.7	35.3	8.7	14.7	16.5	11.1	10.4	26.6
Green Ext Time (p_c), s	0.1	0.0	0.2	2.9	0.0	2.9	0.0	3.3

Intersection Summary	
HCM 2010 Ctrl Delay	63.4
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	251	23	1	178	0	10	0	7	0	0	1
Future Vol, veh/h	0	251	23	1	178	0	10	0	7	0	0	1
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	251	23	1	178	0	10	0	7	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	178	0	0	276	0	0	446	445	265	446	456	178
Stage 1	-	-	-	-	-	-	265	265	-	180	180	-
Stage 2	-	-	-	-	-	-	181	180	-	266	276	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1386	-	-	1275	-	-	519	505	769	519	498	860
Stage 1	-	-	-	-	-	-	736	686	-	817	747	-
Stage 2	-	-	-	-	-	-	816	747	-	735	678	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1386	-	-	1273	-	-	517	503	768	514	497	860
Mov Cap-2 Maneuver	-	-	-	-	-	-	517	503	-	514	497	-
Stage 1	-	-	-	-	-	-	735	685	-	817	746	-
Stage 2	-	-	-	-	-	-	814	746	-	728	677	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.2	9.2
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	597	1386	-	-	1273	-	-	860
HCM Lane V/C Ratio	0.028	-	-	-	0.001	-	-	0.001
HCM Control Delay (s)	11.2	0	-	-	7.8	0	-	9.2
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	897	9	0	689	5	17	1	14	3	0	9
Future Vol, veh/h	36	897	9	0	689	5	17	1	14	3	0	9
Conflicting Peds, #/hr	5	0	4	4	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	36	897	9	0	689	5	17	1	14	3	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	699	0	0	910	0	0	1323	1677	457	1218	1679	352
Stage 1	-	-	-	-	-	-	978	978	-	697	697	-
Stage 2	-	-	-	-	-	-	345	699	-	521	982	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.58	6.58	6.98	7.58	6.58	6.98
Critical Hdwy Stg 1	-	-	-	-	-	-	6.58	5.58	-	6.58	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.58	5.58	-	6.58	5.58	-
Follow-up Hdwy	2.24	-	-	2.24	-	-	3.54	4.04	3.34	3.54	4.04	3.34
Pot Cap-1 Maneuver	880	-	-	732	-	-	112	92	545	134	92	638
Stage 1	-	-	-	-	-	-	265	322	-	393	436	-
Stage 2	-	-	-	-	-	-	638	435	-	501	321	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	876	-	-	729	-	-	107	87	543	125	87	635
Mov Cap-2 Maneuver	-	-	-	-	-	-	107	87	-	125	87	-
Stage 1	-	-	-	-	-	-	253	308	-	375	434	-
Stage 2	-	-	-	-	-	-	629	433	-	467	307	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	32.4	10.8
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	163	876	-	-	729	-	-	-	635
HCM Lane V/C Ratio	0.196	0.041	-	-	-	-	-	-	0.014
HCM Control Delay (s)	32.4	9.3	-	-	0	-	-	0	10.8
HCM Lane LOS	D	A	-	-	A	-	-	A	B
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0	-	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	713	292	72	581	97	151	384	81	137	604	159
Future Volume (veh/h)	124	713	292	72	581	97	151	384	81	137	604	159
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1827	1827	1827	1827	1827	1900	1827	1827	1900	1827	1827	1827
Adj Flow Rate, veh/h	124	713	292	72	581	97	151	384	81	137	604	159
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	151	855	379	92	631	105	178	1036	216	306	1542	689
Arrive On Green	0.09	0.25	0.25	0.05	0.21	0.21	0.10	0.36	0.36	0.18	0.44	0.44
Sat Flow, veh/h	1740	3471	1538	1740	2973	495	1740	2859	597	1740	3471	1551
Grp Volume(v), veh/h	124	713	292	72	338	340	151	232	233	137	604	159
Grp Sat Flow(s),veh/h/ln	1740	1736	1538	1740	1736	1733	1740	1736	1720	1740	1736	1551
Q Serve(g_s), s	8.4	23.4	21.2	4.9	22.9	23.0	10.2	11.8	12.0	8.5	14.0	7.6
Cycle Q Clear(g_c), s	8.4	23.4	21.2	4.9	22.9	23.0	10.2	11.8	12.0	8.5	14.0	7.6
Prop In Lane	1.00		1.00	1.00		0.29	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	151	855	379	92	368	368	178	629	624	306	1542	689
V/C Ratio(X)	0.82	0.83	0.77	0.78	0.92	0.92	0.85	0.37	0.37	0.45	0.39	0.23
Avail Cap(c_a), veh/h	290	897	397	217	376	375	239	629	624	306	1542	689
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.9	42.9	42.1	56.1	46.3	46.3	52.9	28.1	28.2	44.2	22.4	20.6
Incr Delay (d2), s/veh	10.4	6.6	8.6	13.4	26.9	27.7	18.6	1.7	1.7	1.0	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	12.0	9.9	2.7	13.8	13.9	5.8	6.0	6.0	4.2	6.9	3.4
LnGrp Delay(d),s/veh	64.2	49.5	50.7	69.5	73.1	74.1	71.5	29.8	29.9	45.3	23.2	21.4
LnGrp LOS	E	D	D	E	E	E	E	C	C	D	C	C
Approach Vol, veh/h		1129			750			616			900	
Approach Delay, s/veh		51.4			73.2			40.1			26.2	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.1	48.5	10.3	35.0	16.3	58.3	14.4	31.0
Change Period (Y+Rc), s	5.0	* 5	4.0	5.5	4.0	5.0	4.0	5.5
Max Green Setting (Gmax), s	12.0	* 44	15.0	31.0	16.5	39.0	20.0	26.0
Max Q Clear Time (g_c+I1), s	10.5	14.0	6.9	25.4	12.2	16.0	10.4	25.0
Green Ext Time (p_c), s	0.0	3.0	0.1	2.8	0.1	4.8	0.2	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	47.5
HCM 2010 LOS	D

Notes

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	137	7	12	356	0	41	0	20	0	0	5
Future Vol, veh/h	3	137	7	12	356	0	41	0	20	0	0	5
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	3	137	7	12	356	0	41	0	20	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	356	0	0	146	0	0	532	529	143	537	532	356
Stage 1	-	-	-	-	-	-	149	149	-	380	380	-
Stage 2	-	-	-	-	-	-	383	380	-	157	152	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1192	-	-	1424	-	-	455	452	899	452	451	684
Stage 1	-	-	-	-	-	-	849	770	-	638	610	-
Stage 2	-	-	-	-	-	-	636	610	-	841	768	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1192	-	-	1421	-	-	446	445	897	437	444	684
Mov Cap-2 Maneuver	-	-	-	-	-	-	446	445	-	437	444	-
Stage 1	-	-	-	-	-	-	845	766	-	636	603	-
Stage 2	-	-	-	-	-	-	624	603	-	820	764	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.2	12.6	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	534	1192	-	-	1421	-	-	684
HCM Lane V/C Ratio	0.114	0.003	-	-	0.008	-	-	0.007
HCM Control Delay (s)	12.6	8	0	-	7.6	0	-	10.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0

Intersection												
Int Delay, s/veh	1.3											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	41	536	16	3	855	28	7	0	7	53	0	56
Future Vol, veh/h	41	536	16	3	855	28	7	0	7	53	0	56
Conflicting Peds, #/hr	5	0	4	4	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	41	536	16	3	855	28	7	0	7	53	0	56

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	888	0	0	556	0	0	1064	1524	280	1230	1518	447
Stage 1	-	-	-	-	-	-	630	630	-	880	880	-
Stage 2	-	-	-	-	-	-	434	894	-	350	638	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.58	6.58	6.98	7.58	6.58	6.98
Critical Hdwy Stg 1	-	-	-	-	-	-	6.58	5.58	-	6.58	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.58	5.58	-	6.58	5.58	-
Follow-up Hdwy	2.24	-	-	2.24	-	-	3.54	4.04	3.34	3.54	4.04	3.34
Pot Cap-1 Maneuver	746	-	-	997	-	-	175	115	711	132	116	553
Stage 1	-	-	-	-	-	-	431	468	-	304	358	-
Stage 2	-	-	-	-	-	-	565	353	-	634	464	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	742	-	-	993	-	-	149	107	708	124	108	550
Mov Cap-2 Maneuver	-	-	-	-	-	-	149	107	-	124	108	-
Stage 1	-	-	-	-	-	-	406	440	-	286	354	-
Stage 2	-	-	-	-	-	-	504	349	-	593	437	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	20.5	12.3
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	246	742	-	-	993	-	-	-	550
HCM Lane V/C Ratio	0.057	0.055	-	-	0.003	-	-	-	0.102
HCM Control Delay (s)	20.5	10.1	-	-	8.6	0	-	0	12.3
HCM Lane LOS	C	B	-	-	A	A	-	A	B
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0	-	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	473	154	106	650	153	269	938	83	92	345	171
Future Volume (veh/h)	128	473	154	106	650	153	269	938	83	92	345	171
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1827	1827	1827	1827	1827	1900	1827	1827	1900	1827	1827	1827
Adj Flow Rate, veh/h	128	473	154	106	650	153	269	938	83	92	345	171
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	154	974	432	132	747	176	217	959	85	310	1246	556
Arrive On Green	0.09	0.28	0.28	0.08	0.27	0.27	0.13	0.30	0.30	0.18	0.36	0.36
Sat Flow, veh/h	1740	3471	1540	1740	2785	655	1740	3226	285	1740	3471	1550
Grp Volume(v), veh/h	128	473	154	106	405	398	269	505	516	92	345	171
Grp Sat Flow(s),veh/h/ln	1740	1736	1540	1740	1736	1704	1740	1736	1776	1740	1736	1550
Q Serve(g_s), s	8.4	13.2	9.3	7.0	25.8	25.9	14.5	33.4	33.4	5.3	8.2	9.2
Cycle Q Clear(g_c), s	8.4	13.2	9.3	7.0	25.8	25.9	14.5	33.4	33.4	5.3	8.2	9.2
Prop In Lane	1.00		1.00	1.00		0.38	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	154	974	432	132	465	457	217	516	528	310	1246	556
V/C Ratio(X)	0.83	0.49	0.36	0.80	0.87	0.87	1.24	0.98	0.98	0.30	0.28	0.31
Avail Cap(c_a), veh/h	180	974	432	315	539	529	217	516	528	310	1246	556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	34.8	33.4	52.7	40.5	40.5	50.7	40.4	40.4	41.4	26.5	26.8
Incr Delay (d2), s/veh	23.9	0.4	0.5	10.5	12.9	13.3	139.6	34.5	34.0	0.5	0.6	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	6.4	4.0	3.7	14.0	13.9	15.4	20.9	21.3	2.6	4.0	4.2
LnGrp Delay(d),s/veh	75.9	35.1	33.9	63.2	53.5	53.9	190.3	74.8	74.4	41.9	27.0	28.2
LnGrp LOS	E	D	C	E	D	D	F	E	E	D	C	C
Approach Vol, veh/h		755			909			1290			608	
Approach Delay, s/veh		41.8			54.8			98.7			29.6	
Approach LOS		D			D			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.6	39.5	12.8	38.0	18.5	46.6	14.3	36.6
Change Period (Y+Rc), s	5.0	* 5	4.0	5.5	4.0	5.0	4.0	5.5
Max Green Setting (Gmax), s	15.0	* 35	21.0	27.0	14.5	35.0	12.0	36.0
Max Q Clear Time (g_c+I1), s	7.3	35.4	9.0	15.2	16.5	11.2	10.4	27.9
Green Ext Time (p_c), s	0.1	0.0	0.2	2.9	0.0	2.9	0.0	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	63.7
HCM 2010 LOS	E

Notes

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	251	23	1	178	0	10	0	7	0	0	1
Future Vol, veh/h	0	251	23	1	178	0	10	0	7	0	0	1
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	251	23	1	178	0	10	0	7	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	178	0	0	276	0	0	446	445	265	446	456	178
Stage 1	-	-	-	-	-	-	265	265	-	180	180	-
Stage 2	-	-	-	-	-	-	181	180	-	266	276	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1386	-	-	1275	-	-	519	505	769	519	498	860
Stage 1	-	-	-	-	-	-	736	686	-	817	747	-
Stage 2	-	-	-	-	-	-	816	747	-	735	678	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1386	-	-	1273	-	-	517	503	768	514	497	860
Mov Cap-2 Maneuver	-	-	-	-	-	-	517	503	-	514	497	-
Stage 1	-	-	-	-	-	-	735	685	-	817	746	-
Stage 2	-	-	-	-	-	-	814	746	-	728	677	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.2	9.2
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	597	1386	-	-	1273	-	-	860
HCM Lane V/C Ratio	0.028	-	-	-	0.001	-	-	0.001
HCM Control Delay (s)	11.2	0	-	-	7.8	0	-	9.2
HCM Lane LOS	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	897	9	0	689	5	17	1	14	3	0	9
Future Vol, veh/h	36	897	9	0	689	5	17	1	14	3	0	9
Conflicting Peds, #/hr	5	0	4	4	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	36	897	9	0	689	5	17	1	14	3	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	699	0	0	910	0	0	1323	1677	457	1218	1679	352
Stage 1	-	-	-	-	-	-	978	978	-	697	697	-
Stage 2	-	-	-	-	-	-	345	699	-	521	982	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.58	6.58	6.98	7.58	6.58	6.98
Critical Hdwy Stg 1	-	-	-	-	-	-	6.58	5.58	-	6.58	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.58	5.58	-	6.58	5.58	-
Follow-up Hdwy	2.24	-	-	2.24	-	-	3.54	4.04	3.34	3.54	4.04	3.34
Pot Cap-1 Maneuver	880	-	-	732	-	-	112	92	545	134	92	638
Stage 1	-	-	-	-	-	-	265	322	-	393	436	-
Stage 2	-	-	-	-	-	-	638	435	-	501	321	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	876	-	-	729	-	-	107	87	543	125	87	635
Mov Cap-2 Maneuver	-	-	-	-	-	-	107	87	-	125	87	-
Stage 1	-	-	-	-	-	-	253	308	-	375	434	-
Stage 2	-	-	-	-	-	-	629	433	-	467	307	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	32.4	10.8
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	163	876	-	-	729	-	-	-	635
HCM Lane V/C Ratio	0.196	0.041	-	-	-	-	-	-	0.014
HCM Control Delay (s)	32.4	9.3	-	-	0	-	-	0	10.8
HCM Lane LOS	D	A	-	-	A	-	-	A	B
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0	-	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	713	292	72	581	97	151	384	81	137	604	159
Future Volume (veh/h)	124	713	292	72	581	97	151	384	81	137	604	159
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	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 Sat Flow, veh/h/ln	1827	1827	1827	1827	1827	1900	1827	1827	1900	1827	1827	1827
Adj Flow Rate, veh/h	124	713	292	72	581	97	151	384	81	137	604	159
Adj No. of Lanes	1	2	1	1	2	0	1	2	0	1	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	151	855	379	92	631	105	178	1036	216	306	1542	689
Arrive On Green	0.09	0.25	0.25	0.05	0.21	0.21	0.10	0.36	0.36	0.18	0.44	0.44
Sat Flow, veh/h	1740	3471	1538	1740	2973	495	1740	2859	597	1740	3471	1551
Grp Volume(v), veh/h	124	713	292	72	338	340	151	232	233	137	604	159
Grp Sat Flow(s),veh/h/ln	1740	1736	1538	1740	1736	1733	1740	1736	1720	1740	1736	1551
Q Serve(g_s), s	8.4	23.4	21.2	4.9	22.9	23.0	10.2	11.8	12.0	8.5	14.0	7.6
Cycle Q Clear(g_c), s	8.4	23.4	21.2	4.9	22.9	23.0	10.2	11.8	12.0	8.5	14.0	7.6
Prop In Lane	1.00		1.00	1.00		0.29	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	151	855	379	92	368	368	178	629	624	306	1542	689
V/C Ratio(X)	0.82	0.83	0.77	0.78	0.92	0.92	0.85	0.37	0.37	0.45	0.39	0.23
Avail Cap(c_a), veh/h	290	897	397	217	376	375	239	629	624	306	1542	689
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.9	42.9	42.1	56.1	46.3	46.3	52.9	28.1	28.2	44.2	22.4	20.6
Incr Delay (d2), s/veh	10.4	6.6	8.6	13.4	26.9	27.7	18.6	1.7	1.7	1.0	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	12.0	9.9	2.7	13.8	13.9	5.8	6.0	6.0	4.2	6.9	3.4
LnGrp Delay(d),s/veh	64.2	49.5	50.7	69.5	73.1	74.1	71.5	29.8	29.9	45.3	23.2	21.4
LnGrp LOS	E	D	D	E	E	E	E	C	C	D	C	C
Approach Vol, veh/h		1129			750			616			900	
Approach Delay, s/veh		51.4			73.2			40.1			26.2	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.1	48.5	10.3	35.0	16.3	58.3	14.4	31.0
Change Period (Y+Rc), s	5.0	* 5	4.0	5.5	4.0	5.0	4.0	5.5
Max Green Setting (Gmax), s	12.0	* 44	15.0	31.0	16.5	39.0	20.0	26.0
Max Q Clear Time (g_c+I1), s	10.5	14.0	6.9	25.4	12.2	16.0	10.4	25.0
Green Ext Time (p_c), s	0.0	3.0	0.1	2.8	0.1	4.8	0.2	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	47.5
HCM 2010 LOS	D

Notes

APPENDIX C
PREDICTED CRASH FREQUENCY CALCULATION

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	TN	Roadway	San Leandro Street
Agency or Company	FP	Roadway Section	92th Avenue to 98th Avenue
Date Performed	03/07/19	Jurisdiction	Oakland, USA
		Analysis Year	2019

Input Data		**Base Conditions**	**Site Conditions**
Roadway type (2U, 3T, 4U, 4D, ST)		--	5T
Length of segment, L (mi)		--	0.4
AADT (veh/day)	$AADT_{MAX}$ = 53,800 (veh/day)	--	18,790
Type of on-street parking (none/parallel/angle)		None	Parallel (Comm/Ind)
Proportion of curb length with on-street parking		--	0.25
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	0
Minor commercial driveways (number)		--	0
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	14
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	0
Other driveways (number)		--	0
Speed Category		--	Posted Speed Greater than 30 mph
Roadside fixed object density (fixed objects / mi)		0	70
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	6
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.18	1.12	1.00	0.94	1.00	1.24

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**N_{brmv}**	**Combined**	**Calibration Factor, Cr**	**N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-9.70	1.17	0.81	2.454	1.000	2.454	1.24	1.00	3.035
Fatal and Injury (FI)	-10.47	1.12	0.62	0.695	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.271	0.664	1.24	1.00	0.821
Property Damage Only (PDO)	-9.97	1.17	0.88	1.873	$(5)_{TOTAL}-(5)_{FI}$ 0.729	1.790	1.24	1.00	2.214

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted $N_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted $N_{brmv\ (PDO)}$ (crashes/year)**	**Predicted $N_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.821	1.000	2.214	3.035
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.846	0.694	0.651	1.441	2.136
Head-on collision	0.021	0.017	0.004	0.009	0.026
Angle collision	0.050	0.041	0.059	0.131	0.172
Sideswipe, same direction	0.061	0.050	0.248	0.549	0.599
Sideswipe, opposite direction	0.004	0.003	0.009	0.020	0.023
Other multiple-vehicle collision	0.018	0.015	0.029	0.064	0.079

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-4.82	0.54	0.52	0.656	1.000	0.656	1.24	1.00	0.811
Fatal and Injury (FI)	-4.43	0.35	0.36	0.149	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.239	0.157	1.24	1.00	0.194
Property Damage Only (PDO)	-5.83	0.61	0.55	0.476	$(5)_{TOTAL}-(5)_{FI}$ 0.761	0.499	1.24	1.00	0.617

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted $N_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted $N_{brsv\ (PDO)}$ (crashes/year)**	**Predicted $N_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.194	1.000	0.617	0.811
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.016	0.003	0.049	0.030	0.033
Collision with fixed object	0.398	0.077	0.768	0.474	0.551
Collision with other object	0.005	0.001	0.061	0.038	0.039
Other single-vehicle collision	0.581	0.113	0.122	0.075	0.188

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year,**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_i * N_i * (AADT/15,000)^t$	from Table 12-7
Major commercial	0	0.165	1.172	0.000	--
Minor commercial	0	0.053	1.172	0.000	
Major industrial/institutional	0	0.181	1.172	0.000	
Minor industrial/institutional	14	0.024	1.172	0.438	
Major residential	0	0.087	1.172	0.000	
Minor residential	0	0.016	1.172	0.000	
Other	0	0.027	1.172	0.000	
Total	--	--	--	0.438	0.10

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.438	1.000	0.438	1.24	1.00	0.541
Fatal and injury (FI)	--	0.269	0.118	1.24	1.00	0.146
Property damage only (PDO)	--	0.731	0.320	1.24	1.00	0.395

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	3.035	0.811	0.541	4.386	0.023	1.00	0.101
Fatal and injury (FI)	--	--	--	--	--	1.00	0.101

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	3.035	0.811	0.541	4.386	0.012	1.00	0.053
Fatal and injury (FI)	--	--	--	--	--	1.00	0.053

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)** (3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	**Property damage only (PDO)** (5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	**Total** (6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.694	1.441	2.136
Head-on collisions (from Worksheet 1D)	0.017	0.009	0.026
Angle collisions (from Worksheet 1D)	0.041	0.131	0.172
Sideswipe, same direction (from Worksheet 1D)	0.050	0.549	0.599
Sideswipe, opposite direction (from Worksheet 1D)	0.003	0.020	0.023
Driveway-related collisions (from Worksheet 1H)	0.146	0.395	0.541
Other multiple-vehicle collision (from Worksheet 1D)	0.015	0.064	0.079
Subtotal	0.966	2.609	3.576
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.003	0.030	0.033
Collision with fixed object (from Worksheet 1F)	0.077	0.474	0.551
Collision with other object (from Worksheet 1F)	0.001	0.038	0.039
Other single-vehicle collision (from Worksheet 1F)	0.113	0.075	0.188
Collision with pedestrian (from Worksheet 1I)	0.101	0.000	0.101
Collision with bicycle (from Worksheet 1J)	0.053	0.000	0.053
Subtotal	0.347	0.617	0.964
Total	1.314	3.226	4.540

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)** (Total) from Worksheet 1K	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)** (2) / (3)
Total	4.5	0.40	11.3
Fatal and injury (FI)	1.3	0.40	3.3
Property damage only (PDO)	3.2	0.40	8.1

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	TN	Roadway	98th Avenue
Agency or Company	FP	Roadway Section	San Leandro Street to Blake Drive
Date Performed	03/07/19	Jurisdiction	Oakland, USA
		Analysis Year	2019

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	4U
Length of segment, L (mi)		--	0.09
AADT (veh/day)	$AADT_{MAX}$ = 40,100 (veh/day)	--	16,000
Type of on-street parking (none/parallel/angle)		None	None
Proportion of curb length with on-street parking		--	0
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	0
Minor commercial driveways (number)		--	0
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	2
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	0
Other driveways (number)		--	0
Speed Category		--	Posted Speed 30 mph or Lower
Roadside fixed object density (fixed objects / mi)		0	100
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	2
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.00	1.83	1.00	0.92	1.00	1.67

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-11.63	1.33	1.01	0.313	1.000	0.313	1.67	1.00	0.523
Fatal and Injury (FI)	-12.08	1.25	0.99	0.092	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.308	0.096	1.67	1.00	0.161
Property Damage Only (PDO)	-12.53	1.38	1.08	0.206	$(5)_{TOTAL}-(5)_{FI}$ 0.692	0.216	1.67	1.00	0.362

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.161	1.000	0.362	0.523
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.511	0.082	0.506	0.183	0.266
Head-on collision	0.077	0.012	0.004	0.001	0.014
Angle collision	0.181	0.029	0.130	0.047	0.076
Sideswipe, same direction	0.093	0.015	0.249	0.090	0.105
Sideswipe, opposite direction	0.082	0.013	0.031	0.011	0.024
Other multiple-vehicle collision	0.056	0.009	0.080	0.029	0.038

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments									
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-7.99	0.81	0.91	0.078	1.000	0.078	1.67	1.00	0.130
Fatal and Injury (FI)	-7.37	0.61	0.54	0.021	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.250	0.019	1.67	1.00	0.033
Property Damage Only (PDO)	-8.50	0.84	0.97	0.062	$(5)_{TOTAL}-(5)_{FI}$ 0.750	0.058	1.67	1.00	0.097

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.033	1.000	0.097	0.130
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.001	0.000	0.001	0.000	0.000
Collision with fixed object	0.612	0.020	0.809	0.079	0.099
Collision with other object	0.020	0.001	0.029	0.003	0.003
Other single-vehicle collision	0.367	0.012	0.161	0.016	0.028

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year,**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	0	0.182	1.172	0.000	--
Minor commercial	0	0.058	1.172	0.000	
Major industrial/institutional	0	0.198	1.172	0.000	
Minor industrial/institutional	2	0.026	1.172	0.056	
Major residential	0	0.096	1.172	0.000	
Minor residential	0	0.018	1.172	0.000	
Other	0	0.029	1.172	0.000	
Total	--	--	--	0.056	0.81

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.056	1.000	0.056	1.67	1.00	0.094
Fatal and injury (FI)	--	0.342	0.019	1.67	1.00	0.032
Property damage only (PDO)	--	0.658	0.037	1.67	1.00	0.062

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	0.523	0.130	0.094	0.747	0.022	1.00	0.016
Fatal and injury (FI)	--	--	--	--	--	1.00	0.016

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	0.523	0.130	0.094	0.747	0.011	1.00	0.008
Fatal and injury (FI)	--	--	--	--	--	1.00	0.008

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	(5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	(6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.082	0.183	0.266
Head-on collisions (from Worksheet 1D)	0.012	0.001	0.014
Angle collisions (from Worksheet 1D)	0.029	0.047	0.076
Sideswipe, same direction (from Worksheet 1D)	0.015	0.090	0.105
Sideswipe, opposite direction (from Worksheet 1D)	0.013	0.011	0.024
Driveway-related collisions (from Worksheet 1H)	0.032	0.062	0.094
Other multiple-vehicle collision (from Worksheet 1D)	0.009	0.029	0.038
Subtotal	0.193	0.424	0.617
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 1F)	0.020	0.079	0.099
Collision with other object (from Worksheet 1F)	0.001	0.003	0.003
Other single-vehicle collision (from Worksheet 1F)	0.012	0.016	0.028
Collision with pedestrian (from Worksheet 1I)	0.016	0.000	0.016
Collision with bicycle (from Worksheet 1J)	0.008	0.000	0.008
Subtotal	0.057	0.097	0.154
Total	0.251	0.521	0.771

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	0.8	0.09	8.6
Fatal and injury (FI)	0.3	0.09	2.8
Property damage only (PDO)	0.5	0.09	5.8

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	TN	Roadway	98th Avenue
Agency or Company	FP	Roadway Section	Blake Drive to Armstrong Drive
Date Performed	03/07/19	Jurisdiction	Oakland, USA
		Analysis Year	2019

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	4U
Length of segment, L (mi)		--	0.075
AADT (veh/day)	$AADT_{MAX}$ = 40,100 (veh/day)	--	16,000
Type of on-street parking (none/parallel/angle)		None	None
Proportion of curb length with on-street parking		--	0
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	0
Minor commercial driveways (number)		--	0
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	2
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	0
Other driveways (number)		--	0
Speed Category		--	Posted Speed 30 mph or Lower
Roadside fixed object density (fixed objects / mi)		0	100
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	2
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.00	1.83	1.00	0.92	1.00	1.67

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-11.63	1.33	1.01	0.260	1.000	0.260	1.67	1.00	0.436
Fatal and Injury (FI)	-12.08	1.25	0.99	0.077	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.308	0.080	1.67	1.00	0.134
Property Damage Only (PDO)	-12.53	1.38	1.08	0.172	$(5)_{TOTAL}-(5)_{FI}$ 0.692	0.180	1.67	1.00	0.302

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.134	1.000	0.302	0.436
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.511	0.069	0.506	0.153	0.221
Head-on collision	0.077	0.010	0.004	0.001	0.012
Angle collision	0.181	0.024	0.130	0.039	0.064
Sideswipe, same direction	0.093	0.012	0.249	0.075	0.088
Sideswipe, opposite direction	0.082	0.011	0.031	0.009	0.020
Other multiple-vehicle collision	0.056	0.008	0.080	0.024	0.032

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments									
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-7.99	0.81	0.91	0.065	1.000	0.065	1.67	1.00	0.108
Fatal and Injury (FI)	-7.37	0.61	0.54	0.017	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.250	0.016	1.67	1.00	0.027
Property Damage Only (PDO)	-8.50	0.84	0.97	0.052	$(5)_{TOTAL}-(5)_{FI}$ 0.750	0.048	1.67	1.00	0.081

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.027	1.000	0.081	0.108
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.001	0.000	0.001	0.000	0.000
Collision with fixed object	0.612	0.017	0.809	0.066	0.082
Collision with other object	0.020	0.001	0.029	0.002	0.003
Other single-vehicle collision	0.367	0.010	0.161	0.013	0.023

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year,**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	0	0.182	1.172	0.000	--
Minor commercial	0	0.058	1.172	0.000	
Major industrial/institutional	0	0.198	1.172	0.000	
Minor industrial/institutional	2	0.026	1.172	0.056	
Major residential	0	0.096	1.172	0.000	
Minor residential	0	0.018	1.172	0.000	
Other	0	0.029	1.172	0.000	
Total	--	--	--	0.056	0.81

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.056	1.000	0.056	1.67	1.00	0.094
Fatal and injury (FI)	--	0.342	0.019	1.67	1.00	0.032
Property damage only (PDO)	--	0.658	0.037	1.67	1.00	0.062

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	0.436	0.108	0.094	0.638	0.022	1.00	0.014
Fatal and injury (FI)	--	--	--	--	--	1.00	0.014

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	0.436	0.108	0.094	0.638	0.011	1.00	0.007
Fatal and injury (FI)	--	--	--	--	--	1.00	0.007

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)** (3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	**Property damage only (PDO)** (5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	**Total** (6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.069	0.153	0.221
Head-on collisions (from Worksheet 1D)	0.010	0.001	0.012
Angle collisions (from Worksheet 1D)	0.024	0.039	0.064
Sideswipe, same direction (from Worksheet 1D)	0.012	0.075	0.088
Sideswipe, opposite direction (from Worksheet 1D)	0.011	0.009	0.020
Driveway-related collisions (from Worksheet 1H)	0.032	0.062	0.094
Other multiple-vehicle collision (from Worksheet 1D)	0.008	0.024	0.032
Subtotal	0.166	0.363	0.530
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 1F)	0.017	0.066	0.082
Collision with other object (from Worksheet 1F)	0.001	0.002	0.003
Other single-vehicle collision (from Worksheet 1F)	0.010	0.013	0.023
Collision with pedestrian (from Worksheet 1I)	0.014	0.000	0.014
Collision with bicycle (from Worksheet 1J)	0.007	0.000	0.007
Subtotal	0.048	0.081	0.129
Total	0.215	0.444	0.659

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	0.7	0.08	8.8
Fatal and injury (FI)	0.2	0.08	2.9
Property damage only (PDO)	0.4	0.08	5.9

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments			
General Information		**Location Information**	
Analyst	TN	Roadway	98th Avenue
Agency or Company	FP	Roadway Section	San Leandro Street to Pearmain Street
Date Performed	03/07/19	Jurisdiction	Oakland, USA
		Analysis Year	2019

Input Data		**Base Conditions**	**Site Conditions**
Roadway type (2U, 3T, 4U, 4D, ST)		--	5T
Length of segment, L (mi)		--	0.08
AADT (veh/day)	$AADT_{MAX}$ = 53,800 (veh/day)	--	16,000
Type of on-street parking (none/parallel/angle)		None	None
Proportion of curb length with on-street parking		--	0
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	0
Minor commercial driveways (number)		--	0
Major industrial / institutional driveways (number)		--	2
Minor industrial / institutional driveways (number)		--	2
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	0
Other driveways (number)		--	0
Speed Category		--	Posted Speed 30 mph or Lower
Roadside fixed object density (fixed objects / mi)		0	100
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	2
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.00	1.36	1.00	0.94	1.00	1.28

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments									
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**N_{brmv}**	**Combined**	**Calibration Factor, Cr**	**N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-9.70	1.17	0.81	0.407	1.000	0.407	1.28	1.00	0.519
Fatal and Injury (FI)	-10.47	1.12	0.62	0.116	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.272	0.111	1.28	1.00	0.141
Property Damage Only (PDO)	-9.97	1.17	0.88	0.310	$(5)_{TOTAL}-(5)_{FI}$ 0.728	0.296	1.28	1.00	0.378

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	(9)$_{FI}$ from Worksheet 1C	from Table 12-4	(9)$_{PDO}$ from Worksheet 1C	(9)$_{TOTAL}$ from Worksheet 1C
Total	1.000	0.141	1.000	0.378	0.519
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Rear-end collision	0.846	0.119	0.651	0.246	0.365
Head-on collision	0.021	0.003	0.004	0.002	0.004
Angle collision	0.050	0.007	0.059	0.022	0.029
Sideswipe, same direction	0.061	0.009	0.248	0.094	0.102
Sideswipe, opposite direction	0.004	0.001	0.009	0.003	0.004
Other multiple-vehicle collision	0.018	0.003	0.029	0.011	0.013

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments									
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N$_{brsv}$**	**Proportion of Total Crashes**	**Adjusted N$_{brsv}$**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N$_{brsv}$**
	from Table 12-5		from Table 12-5	from Equation 12-13		(4)$_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-4.82	0.54	0.52	0.120	1.000	0.120	1.28	1.00	0.153
Fatal and Injury (FI)	-4.43	0.35	0.36	0.028	(4)$_{FI}$/((4)$_{FI}$+(4)$_{PDO}$) 0.247	0.030	1.28	1.00	0.038
Property Damage Only (PDO)	-5.83	0.61	0.55	0.086	(5)$_{TOTAL}$-(5)$_{FI}$ 0.753	0.091	1.28	1.00	0.116

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	(9)$_{FI}$ from Worksheet 1E	from Table 12-6	(9)$_{PDO}$ from Worksheet 1E	(9)$_{TOTAL}$ from Worksheet 1E
Total	1.000	0.038	1.000	0.116	0.153
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with animal	0.016	0.001	0.049	0.006	0.006
Collision with fixed object	0.398	0.015	0.768	0.089	0.104
Collision with other object	0.005	0.000	0.061	0.007	0.007
Other single-vehicle collision	0.581	0.022	0.122	0.014	0.036

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments					
(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year,**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 n_j * N_j * $(AADT/15{,}000)^t$	from Table 12-7
Major commercial	0	0.165	1.172	0.000	--
Minor commercial	0	0.053	1.172	0.000	
Major industrial/institutional	2	0.181	1.172	0.390	
Minor industrial/institutional	2	0.024	1.172	0.052	
Major residential	0	0.087	1.172	0.000	
Minor residential	0	0.016	1.172	0.000	
Other	0	0.027	1.172	0.000	
Total	--	--	--	0.442	0.10

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.442	1.000	0.442	1.28	1.00	0.564
Fatal and injury (FI)	--	0.269	0.119	1.28	1.00	0.152
Property damage only (PDO)	--	0.731	0.323	1.28	1.00	0.412

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	0.519	0.153	0.564	1.237	0.03	1.00	0.037
Fatal and injury (FI)	--	--	--	--	--	1.00	0.037

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	0.519	0.153	0.564	1.237	0.05	1.00	0.062
Fatal and injury (FI)	--	--	--	--	--	1.00	0.062

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)** (3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	**Property damage only (PDO)** (5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	**Total** (6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.119	0.246	0.365
Head-on collisions (from Worksheet 1D)	0.003	0.002	0.004
Angle collisions (from Worksheet 1D)	0.007	0.022	0.029
Sideswipe, same direction (from Worksheet 1D)	0.009	0.094	0.102
Sideswipe, opposite direction (from Worksheet 1D)	0.001	0.003	0.004
Driveway-related collisions (from Worksheet 1H)	0.152	0.412	0.564
Other multiple-vehicle collision (from Worksheet 1D)	0.003	0.011	0.013
Subtotal	0.293	0.790	1.083
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.001	0.006	0.006
Collision with fixed object (from Worksheet 1F)	0.015	0.089	0.104
Collision with other object (from Worksheet 1F)	0.000	0.007	0.007
Other single-vehicle collision (from Worksheet 1F)	0.022	0.014	0.036
Collision with pedestrian (from Worksheet 1I)	0.037	0.000	0.037
Collision with bicycle (from Worksheet 1J)	0.062	0.000	0.062
Subtotal	0.137	0.116	0.252
Total	0.430	0.906	1.335

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	1.3	0.08	16.7
Fatal and injury (FI)	0.4	0.08	5.4
Property damage only (PDO)	0.9	0.08	11.3

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		**Location Information**	
Analyst	TN	Roadway	Ellington Way
Agency or Company	FP	Intersection	92nd Avenue/Ellington Way
Date Performed	03/07/19	Jurisdiction	Oakland, USA
		Analysis Year	2019

Input Data		**Base Conditions**	**Site Conditions**
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 45,700 (veh/day)	--	4,530
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 9,300 (veh/day)	--	180
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2		--	Not Applicable
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			0
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	0
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	rom Equation 12-3	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	0.91	1.00	0.91

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-13.36	1.11	0.41	0.80	0.152	1.000	0.152	0.91	1.00	0.138
Fatal and Injury (FI)	-14.01	1.16	0.30	0.69	0.068	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.486	0.074	0.91	1.00	0.067
Property Damage Only (PDO)	-15.38	1.20	0.51	0.77	0.072	$(5)_{TOTAL}-(5)_{FI}$ 0.514	0.078	0.91	1.00	0.071

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision $Type_{(FI)}$**	**Predicted $N_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted $N_{bimv\ (PDO)}$ (crashes/year)**	**Predicted $N_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.067	1.000	0.071	0.138
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.421	0.028	0.440	0.031	0.059
Head-on collision	0.045	0.003	0.023	0.002	0.005
Angle collision	0.343	0.023	0.262	0.019	0.042
Sideswipe	0.126	0.008	0.040	0.003	0.011
Other multiple-vehicle collision	0.065	0.004	0.235	0.017	0.021

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-6.81	0.16	0.51	1.14	0.060	1.000	0.060	0.91	1.00	0.055
Fatal and Injury (FI)	--	--	--	--	0.019	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.357	0.021	0.91	1.00	0.019
Property Damage Only (PDO)	-8.36	0.25	0.55	1.29	0.033	$(5)_{TOTAL}-(5)_{FI}$ 0.643	0.039	0.91	1.00	0.035

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted $N_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted $N_{bisv\ (PDO)}$ (crashes/year)**	**Predicted $N_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	$(9)_{FI}$ from Worksheet 2E	from Table 12-13	$(9)_{PDO}$ from Worksheet 2E	$(9)_{PDO}$ from Worksheet 2E
Total	1.000	0.019	1.000	0.035	0.055
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.003	0.000	0.000
Collision with animal	0.003	0.000	0.018	0.001	0.001
Collision with fixed object	0.762	0.015	0.834	0.029	0.044
Collision with other object	0.090	0.002	0.092	0.003	0.005
Other single-vehicle collision	0.039	0.001	0.023	0.001	0.002
Single-vehicle noncollision	0.105	0.002	0.030	0.001	0.003

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	0.138	0.055	0.192	0.021	1.00	0.004
Fatal and injury (FI)	--	--	--	--	1.00	0.004

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections										
(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	0.138	0.055	0.192	0.016	1.00	0.003
Fatal and injury (FI)	--	--	--	--	1.00	0.003

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.028	0.031	0.059
Head-on collisions (from Worksheet 2D)	0.003	0.002	0.005
Angle collisions (from Worksheet 2D)	0.023	0.019	0.042
Sideswipe (from Worksheet 2D)	0.008	0.003	0.011
Other multiple-vehicle collision (from Worksheet 2D)	0.004	0.017	0.021
Subtotal	0.067	0.071	0.138
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.001	0.001
Collision with fixed object (from Worksheet 2F)	0.015	0.029	0.044
Collision with other object (from Worksheet 2F)	0.002	0.003	0.005
Other single-vehicle collision (from Worksheet 2F)	0.001	0.001	0.002
Single-vehicle noncollision (from Worksheet 2F)	0.002	0.001	0.003
Collision with pedestrian (from Worksheet 2G or 2I)	0.004	0.000	0.004
Collision with bicycle (from Worksheet 2J)	0.003	0.000	0.003
Subtotal	0.027	0.035	0.062
Total	0.094	0.106	0.200

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	0.2
Fatal and injury (FI)	0.1
Property damage only (PDO)	0.1

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		**Location Information**	
Analyst	TN	Roadway	98th Avenue
Agency or Company	FP	Intersection	98th Avenue/Blake Drive/Medford Avenue
Date Performed	03/07/19	Jurisdiction	Oakland, USA
		Analysis Year	2019

Input Data		**Base Conditions**	**Site Conditions**
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4ST
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 46,800 (veh/day)	--	16,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 5,900 (veh/day)	--	440
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	1
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2		--	Not Applicable
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			0
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	0
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	6

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF* $_{COMB}$
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.73	1.00	1.00	1.00	0.91	1.00	0.67

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-8.90	0.82	0.25	0.40	1.750	1.000	1.750	0.67	1.00	1.166
Fatal and Injury (FI)	-11.13	0.93	0.28	0.48	0.655	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.369	0.646	0.67	1.00	0.430
Property Damage Only (PDO)	-8.74	0.77	0.23	0.40	1.121	$(5)_{TOTAL}-(5)_{FI}$ 0.631	1.104	0.67	1.00	0.736

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.430	1.000	0.736	1.166
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.338	0.145	0.374	0.275	0.421
Head-on collision	0.041	0.018	0.030	0.022	0.040
Angle collision	0.440	0.189	0.335	0.247	0.436
Sideswipe	0.121	0.052	0.044	0.032	0.084
Other multiple-vehicle collision	0.060	0.026	0.217	0.160	0.186

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
	SPF Coefficients			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
Crash Severity Level	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-5.33	0.33	0.12	0.65	0.245	1.000	0.245	0.67	1.00	0.164
Fatal and Injury (FI)	--	--	--	--	0.069	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.344	0.084	0.67	1.00	0.056
Property Damage Only (PDO)	-7.04	0.36	0.25	0.54	0.131	$(5)_{TOTAL}-(5)_{FI}$ 0.656	0.161	0.67	1.00	0.107

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted $N_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted $N_{bisv\ (PDO)}$ (crashes/year)**	**Predicted $N_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	$(9)_{FI}$ from Worksheet 2E	from Table 12-13	$(9)_{PDO}$ from Worksheet 2E	$(9)_{PDO}$ from Worksheet 2E
Total	1.000	0.056	1.000	0.107	0.164
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.001	0.000	0.026	0.003	0.003
Collision with fixed object	0.679	0.038	0.847	0.091	0.129
Collision with other object	0.089	0.005	0.070	0.008	0.013
Other single-vehicle collision	0.051	0.003	0.007	0.001	0.004
Single-vehicle noncollision	0.179	0.010	0.049	0.005	0.015

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	1.166	0.164	1.330	0.022	1.00	0.029
Fatal and injury (FI)	--	--	--	--	1.00	0.029

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections										
(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	1.166	0.164	1.330	0.018	1.00	0.024
Fatal and injury (FI)	--	--	--	--	1.00	0.024

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.145	0.275	0.421
Head-on collisions (from Worksheet 2D)	0.018	0.022	0.040
Angle collisions (from Worksheet 2D)	0.189	0.247	0.436
Sideswipe (from Worksheet 2D)	0.052	0.032	0.084
Other multiple-vehicle collision (from Worksheet 2D)	0.026	0.160	0.186
Subtotal	0.430	0.736	1.166
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.003	0.003
Collision with fixed object (from Worksheet 2F)	0.038	0.091	0.129
Collision with other object (from Worksheet 2F)	0.005	0.008	0.013
Other single-vehicle collision (from Worksheet 2F)	0.003	0.001	0.004
Single-vehicle noncollision (from Worksheet 2F)	0.010	0.005	0.015
Collision with pedestrian (from Worksheet 2G or 2I)	0.029	0.000	0.029
Collision with bicycle (from Worksheet 2J)	0.024	0.000	0.024
Subtotal	0.109	0.107	0.217
Total	0.540	0.843	1.383

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	1.4
Fatal and injury (FI)	0.5
Property damage only (PDO)	0.8

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections			
General Information		**Location Information**	
Analyst	TN	Roadway	98th Avenue
Agency or Company	FP	Intersection	98th Avenue/San Leandro Street
Date Performed	03/07/19	Jurisdiction	Oakland, USA
		Analysis Year	2019

Input Data		**Base Conditions**	**Site Conditions**
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 67,700 (veh/day)	--	18,790
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 33,400 (veh/day)	--	15,160
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	4
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3		0	4
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Protected
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Protected
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			6,790
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	6
Number of bus stops within 300 m (1,000 ft) of the intersection		0	3
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.66	0.94	0.85	1.00	0.91	1.00	0.48

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.99	1.07	0.23	0.39	5.778	1.000	5.778	0.48	1.00	2.773
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	1.805	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.323	1.869	0.48	1.00	0.897
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	3.774	$(5)_{TOTAL}-(5)_{FI}$ 0.677	3.909	0.48	1.00	1.876

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision $Type_{(FI)}$**	**Predicted $N_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted $N_{bimv\ (PDO)}$ (crashes/year)**	**Predicted $N_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.897	1.000	1.876	2.773
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.450	0.404	0.483	0.906	1.310
Head-on collision	0.049	0.044	0.030	0.056	0.100
Angle collision	0.347	0.311	0.244	0.458	0.769
Sideswipe	0.099	0.089	0.032	0.060	0.149
Other multiple-vehicle collision	0.055	0.049	0.211	0.396	0.445

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.399	1.000	0.399	0.48	1.00	0.191
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.108	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.275	0.110	0.48	1.00	0.053
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.284	$(5)_{TOTAL}-(5)_{FI}$ 0.725	0.289	0.48	1.00	0.139

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections					
(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type(FI)**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type (PDO)**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	$(9)_{FI}$ from Worksheet 2E	from Table 12-13	$(9)_{PDO}$ from Worksheet 2E	$(9)_{PDO}$ from Worksheet 2E
Total	1.000	0.053	1.000	0.139	0.191
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.002	0.000	0.002	0.000	0.000
Collision with fixed object	0.744	0.039	0.870	0.121	0.160
Collision with other object	0.072	0.004	0.070	0.010	0.014
Other single-vehicle collision	0.040	0.002	0.023	0.003	0.005
Single-vehicle noncollision	0.141	0.007	0.034	0.005	0.012

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
4.15	1.00	1.12	4.65

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections										
(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.300	4.65	1.00	1.397
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	1.397

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	f_{bikei}	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	2.773	0.191	2.964	0.015	1.00	0.044
Fatal and injury (FI)	--	--	--	--	1.00	0.044

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
	MULTIPLE-VEHICLE		
Rear-end collisions (from Worksheet 2D)	0.404	0.906	1.310
Head-on collisions (from Worksheet 2D)	0.044	0.056	0.100
Angle collisions (from Worksheet 2D)	0.311	0.458	0.769
Sideswipe (from Worksheet 2D)	0.089	0.060	0.149
Other multiple-vehicle collision (from Worksheet 2D)	0.049	0.396	0.445
Subtotal	0.897	1.876	2.773
	SINGLE-VEHICLE		
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.039	0.121	0.160
Collision with other object (from Worksheet 2F)	0.004	0.010	0.014
Other single-vehicle collision (from Worksheet 2F)	0.002	0.003	0.005
Single-vehicle noncollision (from Worksheet 2F)	0.007	0.005	0.012
Collision with pedestrian (from Worksheet 2G or 2I)	1.397	0.000	1.397
Collision with bicycle (from Worksheet 2J)	0.044	0.000	0.044
Subtotal	1.494	0.139	1.633
Total	2.391	2.015	4.405

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections	
(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	4.4
Fatal and injury (FI)	2.4
Property damage only (PDO)	2.0

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