OAKLAND TRANSPORTATION AND CAPITAL IMPROVEMENTS IMPACT FEE NEXUS ANALYSIS

Prepared for

CITY OF OAKLAND

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EXECUTIVE SUMMARY

BACKGROUND AND STUDY OBJECTIVES

This report is a supporting document for adoption and implementation of citywide development impact fees by the City of Oakland (City). The objective of a citywide development impact fee is to provide a mechanism for new development projects to contribute financially to the one-time cost of improving and expanding public facilities needed to accommodate that development. The term "public facilities" may refer to any type of infrastructure, buildings, capital facility, or capital improvement and may include land, furnishings, equipment, and vehicles.

This report was prepared by a consultant team led by Hausrath Economics Group. Urban Economics, a member of the consultant team, was primarily resposible for producing this report on the transportation and capital improvements impact fees.

NEW DEVELOPMENT, 2015-2040

The City will continue to attract growth and investment as a primary place for both population and employment growth within the San Francisco Bay region. Based on current development projections the City will grow by 109,000 residents and 57,000 jobs by 2040. The City will need to improve and expand public facilities to serve this new development or its existing facilities will become increasing congested leading to declines in levels of service. **Figures E-1** and **E-2** show how this growth is allocated by land use category for residential and nonresidential development, respectively. Multifamily housing will comprise nearly all residential growth (93 percent). Office will comprise the largest share of growth in nonresidential building space (41 percent).

TRANSPORTATION IMPACT FEE

Oakland has a surface transportation network that provides rights-of-way (streets, sidewalks, and off-street pedestrian and bicycle paths) for nearly all types of travel within the city. The City is responsible for maintaining, improving, and expanding this infrastructure to support transportation services for most travel modes: vehicles, including private vehicles and public bus transit, biking and walking.

The City has limited funding sources for expanding and improving transportation infrastructure. The City's current two-year CIP allocates $15 million from the countywide sales taxes (Measures B and BB) and anticipates $17 million from grants to improve and upgrade transportation infrastructure, for a total of $32 million. By comparison, the current replacement value of the City's transportation infrastructure is $4.1 billion.

Figure E-1: Residential Growth, 2015-2040
(housing units)

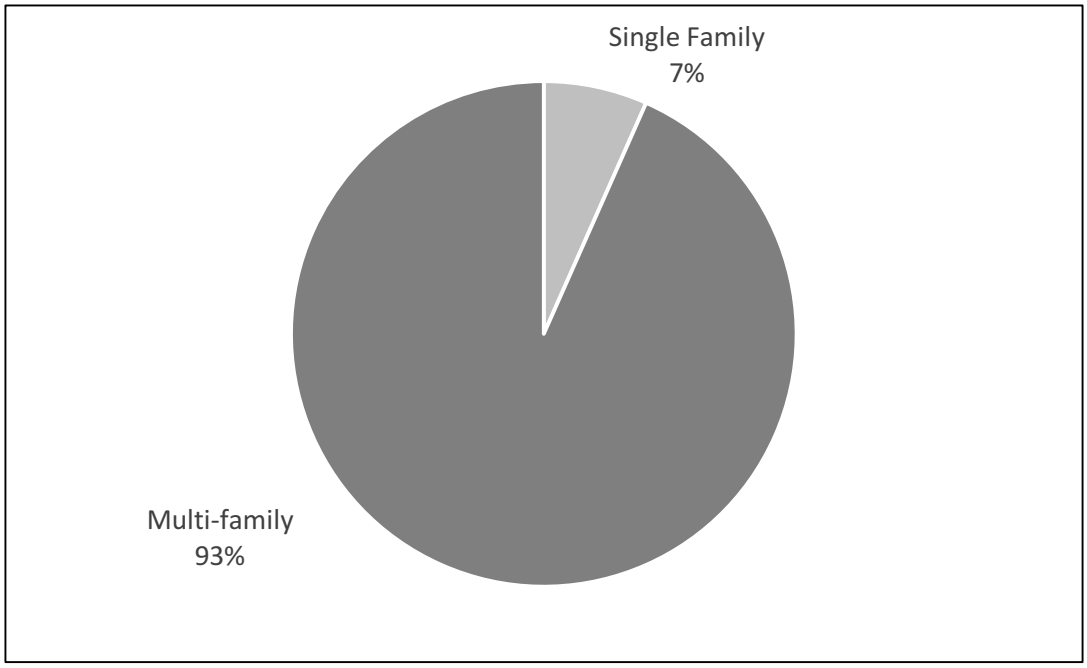
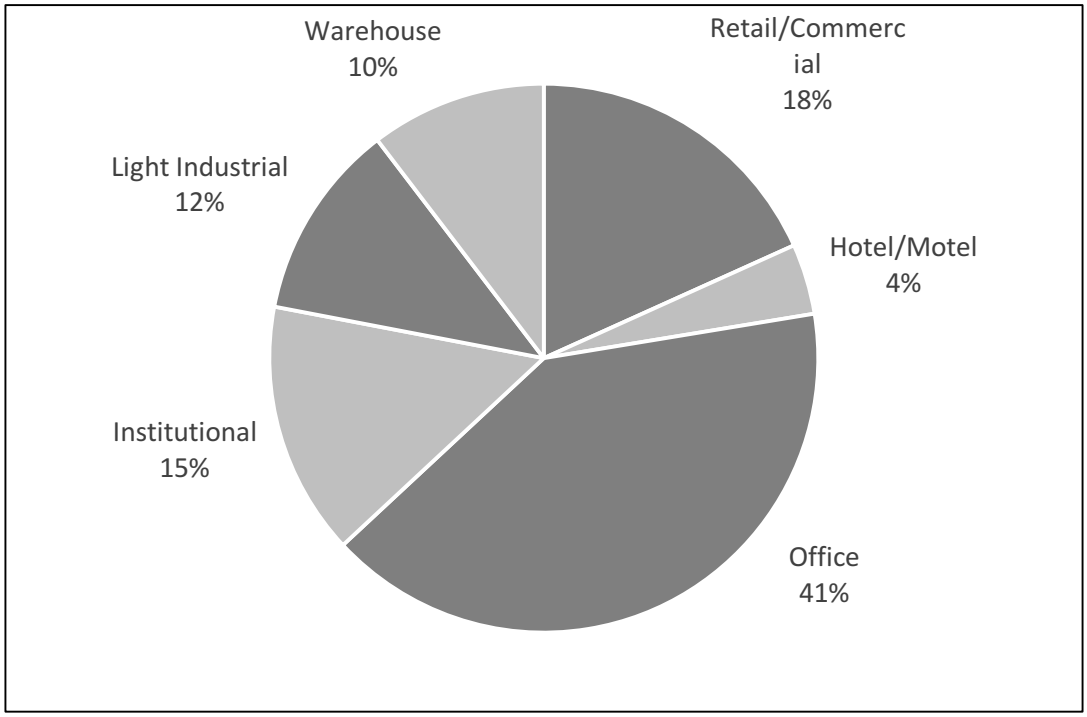


Figure E-2: Nonresidential Growth, 2015-2040
(building square feet)



A transportation impact fee would provide revenue to augment this limited funding. The fee would fund improvements and expansion to this citywide transportation infrastructure to address and manage additional travel demand from new development for all travel modes. The nexus between new development and the need for citywide transportation infrastructure is based on maintaining the City's existing level of investment in that infrastructure as the City grows.

The transportation impact fee is designed to provide a flexible funding source for transportation investments throughout the city. This approach avoids segmenting the city into zones for the purposes of calculating the fee. Instead, use of the fee for capital projects would be focused on transportation infrastructure that connect residential neighborhoods, retail and employment centers, and other destinations. Improvements to streets that only serve a particular neighborhood and do not provide connectivity between areas would not be eligible for funding from the fee. This approach enables fee revenues to be used for improvement and expansion throughout the city as long as the capital project is part of the citywide transportation infrastructure (see Figures 3 through 8 in Chapter III). Capital projects eligible for funding would be identified in the Streets & Sidewalks and Traffic Improvement categories within the City's *Capital Improvement Program*.

CAPITAL IMPROVEMENTS IMPACT FEE

The capital improvements impact fee includes public facilities that support the following public services:

- Fire protection and emergency medical services
- Police protection
- Libraries
- Parks and recreation (including open space)
- Storm drain infrastructure

The City has no dedicated funding source for the types of public facilities included in the capital improvements impact fee. Spending on these types of capital improvements is $1.3 million in the City's current *FY 2015-17 Capital Improvement Program* (CIP), or 2.1 percent of total CIP spending. The entire amount is allocated to disability access projects and is funded by the General Purpose Fund. By comparison, the current replacement value of the public facilities associated with the services listed above is $3.2 billion.

Sanitary sewer facilities were included in the scope of work for the nexus analysis but have been excluded from the capital improvements impact fee due to the availability of alternative funding. The existing sanitary sewer user charge generates approximately $58 million annually of which about $18 million is allocated for substantially the same types of improvements that would be funded by the impact fee.

The purpose of the City's capital improvements impact fee is to accommodate the impact of new development by funding improvements and expansion to the City's public facilities that support fire and police protection, libraries, parks and recreation, and storm drain services. The purpose

of the fee is also to support rehabilitation of the City's storm drain infrastructure because these facilities:

- Have substantial existing rehabilitation needs due to age and condition, and as a result are under-capacity;
- Are unlikely to be affected substantially by new development because the extent of the city's impervious surface area that is the direct cause of storm runoff is unlikely to increase;
- Even if storm runoff would increase as a result of a development project the City's storm water regulations require that projects to mitigate such increases on site, avoiding any impact on the existing storm water system.

Growth in residents and workers from new development will increase demands on public facilities. Similar to the transportation impact fee, the nexus between new development and the need for capital improvements is based on maintaining the City's existing level of investment in existing public facilities as the City grows.

MAXIMUM LEGAL IMPACT FEES

The maximum legal impact fees based on this nexus analysis are shown in **Table E-1** by land use category.

IMPLEMENTATION

The follow sections discuss implementation issues related to the two proposed impact fees. More detail may be found in Chapters III and IV.

Eligible Use of Funds

To remain consistent with the nexus analysis fee revenues must be used only for the following purposes for a capital project as defined in the City's *Capital Improvement Program*.

- **Transportation impact fee**

  The capital project must be listed within the Streets & Sidewalks and Traffic Improvements categories of the City's *Capital Improvement Program*. The project must also be part of the City's citywide transportation infrastructure as shown in Figures 3, 4, and 5 in Chapter III. The capital project must improve or expand the City's citywide transportation infrastructure to address and manage vehicle travel demand from new development, and to shift demand to transit, biking, and walking. Projects may address the negative impacts of increased vehicle trips through traffic calming facilities and other vehicle restrictions. Funds may not be used for rehabilitation, maintenance, or operating costs.

Table E-1: Maximum Legal Impact Fees

Land Use	Per Housing Unit (HU) or per Building Sq. Ft. (SF)	Transportation	Capital Improvements
Residential			
Single Family	per HU	$17,754	$18,847
Townhome	per HU	$17,754	$18,847
Multi-Family	per HU	$12,428	$13,570
Nonresidential			
Retail/Commercial	per SF	$12.61	$5.65
Hotel/Motel	per SF	$11.01	$2.45
Office	per SF	$14.56	$6.78
Institutional	per SF	$20.95	$3.39
Industrial	per SF	$9.41	$4.33
Warehouse	per SF	$5.50	$1.13

Source: Tables 12 and 20.

- **Capital improvements impact fee**

  The capital project must be part of the City's public facilities as defined in Chapter IV that support fire, police, library, parks and recreation, or storm drain services and includes land, including parkland and open space, park improvements, buildings, vehicles, furnishings, equipment, library collection, and related infrastructure. The capital project must improve or expand the City's public facilities to accommodate service demand from new development. Funds may not be used for rehabilitation unless for storm drain facilities. Funds may not be used for maintenance or operating costs.

- **Mitigation Fee Act costs**

  Fee revenues may be used for implementation costs reasonably related to compliance with the Act, including collecting, accounting, and managing expenditure of fee revenues in accordance with the Act, as well as preparing financial reports and nexus studies required to make any necessary findings and determinations under the Act.

Inflation Adjustment

The City should adjust each impact fee annually for inflation in the replacement cost of the facilities used in each nexus analysis. Several different inflation indices for construction of buildings and infrastructure are published on a regular basis for this purpose. The City should select one of these indices and use it annually to adjust the fees.

Annual and Periodic Reporting Requirements

The City should comply with the annual reporting requirements under Section 66006(b) related to beginning and ending account balances, revenues received, and capital projects funded. Following the fifth fiscal year after the first deposit of fee revenue and every five years thereafter, the City should comply with the reporting requirements under Section 66001(d).

I. INTRODUCTION

BACKGROUND AND STUDY OBJECTIVES

This report is a supporting document for adoption and implementation of citywide development impact fees by the City of Oakland (City). The objective of a citywide development impact fee is to provide a mechanism for new development projects to contribute financially to the one-time cost of improving and expanding public facilities needed to accommodate that development. The term "public facilities" may refer to any type of infrastructure, buildings, capital facility, or capital improvement and may include land, furnishings, equipment, and vehicles.

This report is one of three reports produced as a result of the Nexus Study and Economic Feasibility Analysis for the City. The other two reports are the *Oakland Affordable Housing Impact Fee Nexus Analysis* and the *Oakland Impact Fee Economic Feasibility Study*. The reports were prepared by a consultant team led by Hausrath Economics Group. Urban Economics, a member of the consultant team, was primarily resposible for producing this report on the transportation and capital improvements impact fees.

Development impact fees are commonly used by local agencies throughout California and in many other states as one of many funding sources for capital improvement programs. Development impact fees are just one of several land use regulatory tools available to cities to offset development impacts. Other tools include: (1) design standards, (2) mitigations required through the environmental review process, and (3) development agreements. Fees are a one-time, not recurring, revenue source paid once at the start of a development project. With rare exceptions, fee revenue is restricted to funding capital costs to rehabilitate, improve, or expand existing facilities that accommodate growth, and may not be used for annual operation or maintenance costs.

California local agencies may adopt development impact fees under authority granted by the Mitigation Fee Act (the Act), contained in Sections 66000 to 66025 of the *California Government Code*. The primary purpose of this report is to substantiate the findings required by the Act for adoption of the following two citywide development impact fees:

- A transportation impact fee for transportation infrastructure
- A capital improvements impact fee for fire, police, library, parks, and storm drain facilities

This report explains the fee calculation methodology also known as a "nexus analysis" for each of the two impact fees. Based on the nexus analysis the report presents a schedule of maximum legal fees by land use category for each of the two fees. The City may adopt fees up to the maximum amount shown in each fee schedule for each land use category.

The key findings required by the Act and documented by this report relate to the following reasonable relationships:

- **Impact:** Reasonable relationship between new development and need for public facilities.
- **Benefit:** Reasonable relationship between new development and the use of fee revenue for public facilities to accommodate that development.
- **Proportionality:** Reasonable relationship between the amount of the fee and the proportionate cost of public facilities attributable to new development.

Together these three key findings define the nexus between the impact of development, the amount of the fee, and the benefits received.

The Act also requires a description of the public facilities to be funded by the fee. This report fulfills that requirement by describing the types of facilities eligible for funding by each fee. Specific capital projects to be funded will be identified by the City as part of periodic updates to its capital improvement program.

REPORT ORGANIZATION

The nexus study is organized as follows:

- The *Existing and Future Development* chapter presents the land use data used in the nexus analysis.
- The *Transportation Infrastructure* chapter explains the nexus analysis and presents the maximum legal fee schedule for the transportation impact fee.
- The *Capital Improvements* chapter explains the nexus analysis and presents the maximum legal fee schedule for the capital improvements impact fee.
- *Appendix A* provides detail on 2015 baseline conditions for housing, population, employment, and land use.
- *Appendix B* documents a fair share mitigation cost for cumulative traffic impact measures.
- *Appendix C* provides detail for the fire, police, parks, and library existing public facility inventories used in the nexus analysis for the capital improvements impact fee.
- *Appendix D* provides detail for the existing utility infrastructure used in the nexus analysis for the capital improvements impact fee.

II. EXISTING AND FUTURE DEVELOPMENT

This chapter describes existing land use for 2015 and development projections for 2040 used by the nexus analysis in subsequent chapters.

LAND USE CATEGORIES

Land use categories are used to differentiate the impact of development on the need for public facilities based on characteristics that vary by land use. For the transportation impact fee, the key characteristic is travel demand. For the capital improvements fee the key characteristic is the number of residents or workers. The land use categories used in this nexus analysis and the typical uses included in each category are shown below in **Table 1**.

Table 1: Land Use Categories

Land Use	Typical Types of Land Uses
Residential	
Single Family	Single family detached
Townhome	Single family attached
Multi-Family	Apartments and live/work units; excludes residential care facilities (see Institutional category)
Nonresidential	
Retail/Commercial	Retail and service commercial uses
Hotel/Motel	Visitor lodging uses
Office	Office uses including medical office
Industrial	Industrial uses including manufacturing
Warehouse	Storage, warehousing, transportation, and logistics uses
Institutional	Private & religious schools, public facilities, hospitals & related facilities, residential care facilities, recreational uses, and churches

Source: City of Oakland and Urban Economics.

EXISTING (2015) LAND USE

Existing development in the City as of 2015 provides a baseline for the nexus analysis. Existing development is expressed both in terms of residents and housing units, and workers and building space. Existing development is used to calculate the City's current level of investment in public facilities per unit of demand. As explained in the following chapters, the current level of investment per unit of demand serves to establish the need for new development to contribute to improvement and expansion of existing public facilities.

Table 2 presents estimates of existing development in the City for residential land uses. Current U.S. Census data for residents per housing unit were used to allocate residents by housing type.

Table 2: 2015 Residential Land Use

Land Use	Population /a/	Residents per Housing Unit	Housing Units
Single Family /b/	226,300	2.77	81,700
Multi-Family	179,300	1.99	90,000
Total	405,600		171,700

/a/ Household population only. Excludes population living in group quarters.

/b/ Includes townhomes (single family attached units).

Source: Appendix A; U.S. Census Bureau, 5-Year American Community Survey, 2009-2013.

Table 3 present estimates of existing development in the City for nonresidential land uses. See **Appendix A** for detail regarding methods and sources. Subtotals excluding local government data are used in the nexus analysis, as explained in subsequent chapters.

2040 LAND USE

The City will continue to attract growth and investment as a primary place for both population and employment growth within the San Francisco Bay region. Based on current development projections the City will grow by 109,000 residents and 57,000 jobs by 2040. These projections are based on the most recent estimates available when the nexus analysis was conducted. Projections were prepared by the Association of Bay Area Governments (ABAG) for the nine-county San Francisco Bay region in association with the Metropolitan Transportation Commission (MTC). These ABAG/MTC development projections, known as the "Jobs Housing Connections" scenario, were approved in 2013 and are used for the most recent regional land use and transportation plan (*Plan Bay Area*). The City will need to improve and expand public facilities to serve this new development or its existing facilities will become increasing congested leading to declines in levels of service.

Projected 2040 land use is shown in **Table 4**. **Table 5** shows the growth from 2015 to 2040. **Figures 1 and 2** show how this growth is allocated by land use category for residential and nonresidential development, respectively. Multifamily housing will comprise nearly all residential growth (93 percent). Office will comprise the largest share of growth in nonresidential building space (41 percent).

Table 3: 2015 Nonresidential Land Use

Land Use	Employment	Density		Building Space	
		Sq. Ft. per Worker	*Workers per 1,000 Sq. Ft.*	**Amount** *(1,000 Sq. Ft.)*	**Sub-category Share**
Retail/Commercial	33,400	386	2.59	12,900	100%
Eating & Drinking	*10,700*	*250*		*2,700*	*21%*
All Other	*22,700*	*450*		*10,200*	*79%*
Hotel/Motel	2,900	900	1.11	2,600	NA
Office	82,100	325	3.08	26,700	NA
Institutional	48,800	625	1.60	30,500	100%
Education /a/	*19,400*	*596*		*11,600*	*38%*
Non-local Government /a/	*4,500*	*1,130*		*5,100*	*17%*
Hospital	*13,900*	*450*		*6,300*	*21%*
Social Assistance	*3,900*	*450*		*1,800*	*6%*
Cultural[3]	*7,100*	*808*		*5,700*	*19%*
Industrial	16,700	500	2.00	8,400	NA
Warehouse	22,200	1,800	0.56	40,000	NA
On-Site Construction	1,200	-	-	-	NA
Subtotal Excluding Local Government	**207,300**			**121,100**	NA
Local Government /a/	11,500	670	1.49	7,700	100%
Office	*5,800*	*400*		*2,300*	*30%*
Institutional	*5,700*	*941*		*5,400*	*70%*
Total Nonresidential	218,800			128,800	NA

/a/ All local government employment (City of Oakland, Oakland Unified School District, and Port of Oakland) is identified separately at the bottom of the table under "Local Government".

Source: Appendix A.

Table 4: 2040 Land Use

Land Use	Residents or Employment /a/	Density *(Residents per Unit or Sq. Ft. per Worker)*	Housing Units or 1,000 Building Sq. Ft.
Residential			
Single Family	235,500	2.77	85,000
Multi-Family	279,100	2.05	136,400
Total Residential	514,600		221,400
Nonresidential			
Retail/Commercial	44,800	386	17,300
Hotel/Motel	4,000	900	3,600
Office	112,400	325	36,500
Institutional	54,500	625	34,100
Industrial	22,400	500	11,200
Warehouse	23,600	1,800	42,500
Subtotal	261,700		145,200
On-Site Construction	1,500	-	-
Local Government /b/	12,600	670	8,400
Total Nonresidential	275,800		153,600

/a/ Household population only. Excludes population living in group quarters.

/b/ Includes City of Oakland, Oakland Unified School District, and Port of Oakland.

Source: Association of Bay Area Governments, *ABAG Projections 2013*; Hausrath Economics Group; Table 2.

Table 5: 2015-2040 Growth

Land Use	Residents or Employment /a/	Density *(Residents per Unit or Square Feet per Worker)*	Housing Units or 1,000 Building Sq. Ft.
Residential			
Single Family	9,200	2.79	3,300
Multi-Family	99,800	2.15	46,400
Total Residential	109,000		49,700
Nonresidential			
Retail/Commercial	11,400	386	4,400
Hotel/Motel	1,100	900	1,000
Office	30,300	325	9,800
Institutional	5,700	625	3,600
Industrial	5,700	500	2,800
Warehouse	1,400	1,800	2,500
Subtotal	55,600		24,100
On-Site Construction	300	-	-
Local Government /b/	1,100	670	700
Total Nonresidential	57,000		24,800

/a/ Household population only. Excludes population living in group quarters.

/b/ Includes City of Oakland, Oakland Unified School District, and Port of Oakland.

Source: Table 3 and 4.

Figure 1: Residential Growth, 2015-2040
(housing units)

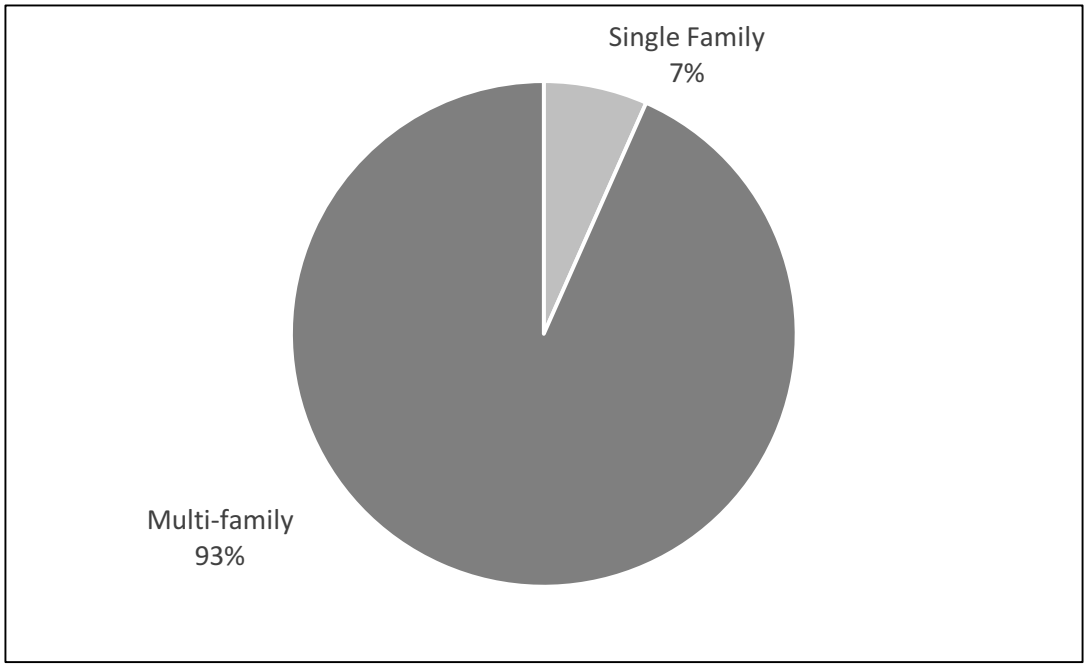
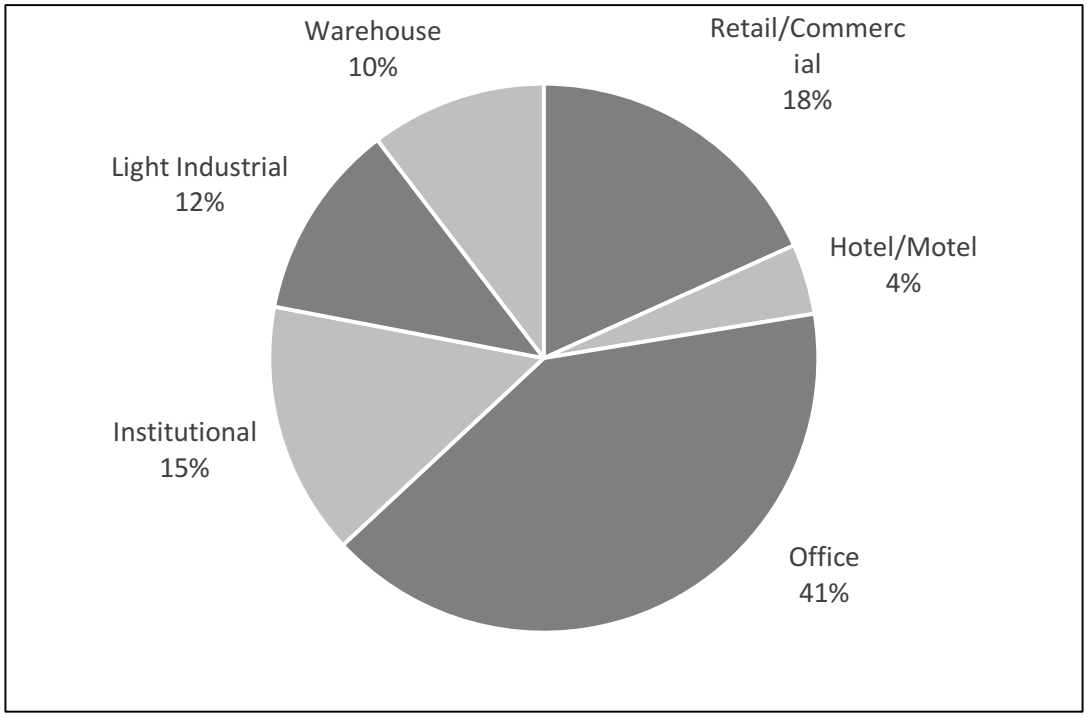


Figure 2: Nonresidential Growth, 2015-2040
(building square feet)



III. TRANSPORTATION INFRASTRUCTURE

INTRODUCTION

Oakland has a surface transportation network that provides rights-of-way (streets, sidewalks, and off-street bicycle and pedestrian paths) for nearly all types of travel within the city. The City is responsible for maintaining, improving, and expanding this infrastructure to support transportation services for people traveling by all modes, including walking, biking, transit, and private vehicles. The City is not responsible for certain surface transportation, including the infrastructure directly associated with bus and rail transit and the interstate highway system.

This chapter presents the nexus analysis for the transportation impact fee under the following sections:

- Need for additional capital funding
- Nexus methodology
- Existing and projected travel demand
- Inventory of citywide transportation infrastructure
- Maximum legal impact fee
- Implementation

NEED FOR ADDITIONAL CAPITAL FUNDING

The City has limited funding sources for expanding and improving transportation infrastructure. A substantial portion of ongoing capital funding from the Alameda County Transportation Agency sales tax measures (Measures B and BB) is directed at maintenance of existing assets. The City's current *FY 2015-17 Capital Improvement Program* (CIP) allocates $34 million from these two sources of which about $15 million is allocated to improvements and upgrades to transportation infrastructure and the remainder directed at repair, maintenance, and safety projects. Funding for transportation expansion and improvements comes also from competitive grants though grants do not provide a secure ongoing funding source. The City's current CIP anticipates $17 million from grants to improve and upgrade transportation infrastructure.

NEXUS METHODOLOGY

The purpose of the transportation impact fee is to fund improvements and expansion to the City's citywide transportation infrastructure to address and manage the impacts of additional travel demand from new development. Strategies may include not only managing vehicle impacts, but also shifting demand to transit, biking, and walking.

The first step in the nexus methodology is to estimate existing and future travel demand within the city. The nexus analysis uses trip generation rates by land use to reflect variations in travel

demand among land uses. This approach provides a reasonable relationship between the type of development that would pay the fee, the amount of the fee, and the cost of transportation infrastructure needed to accommodate that development.

The transportation impact fee is designed to provide a flexible funding source for transportation investments throughout the city. This approach avoids segmenting the city into zones for the purposes of calculating the fee. Instead, the second step of the nexus analysis is to identify those components of the City's transportation infrastructure that connect residential neighborhoods, retail and employment centers, and other destinations. Streets that serve a particular neighborhood and do not provide connectivity between areas are excluded. This approach enables fee revenues to be used for improvement and expansion throughout the city as long as the capital project is part of this citywide transportation infrastructure.

More travel from new development will increase demands on citywide transportation infrastructure. Consequently, the nexus between new development and the need for citywide transportation infrastructure is based on maintaining the City's existing level of investment in that infrastructure as the City grows. Thus the third step in the nexus analysis is to identify the existing level of investment in this infrastructure per unit of development. This existing level of investment represents the facility standard that defines new development's maximum potential contribution to improved and expanded facilities needed to accommodate growth. The level of investment is used to develop the schedule of maximum legal impact fees by land use category.

EXISTING AND PROJECTED TRAVEL DEMAND

The nexus analysis measures the impact of development on the transportation system using rates of trip generation by land use category. Trips occur between origins and destinations such as from home to work, or from work to shopping, or from shopping back to home. Trip generation rates by land use category are a reasonable measure of travel demand, or the desire for mobility by residents and workers to access homes, jobs, shopping, recreation, and other activities. For the purposes of the nexus analysis trip generation represents the movement by one person on a typical weekday from one activity to another regardless of travel mode (driving, riding transit, biking, or walking). Trip generation rates refer to "trip ends" with each trip having two trip ends.

Table 6 shows the average weekday trip generation rates for the land use categories used in the nexus analysis. Some trip ends from new development do not place additional demands on transportation infrastructure. These trip ends are intermediate stops between the origin and final destination. Table 6 includes an adjustment for primary trip shares that represent the share of total trip ends that are an origin or final destination and excludes intermediate trip ends.

For the retail/commercial and institutional land use categories in Table 6, trip generation rates and primary trip shares by subcategory are used to calculate the rate for the overall category. Subcategory data are weighted based on the 2015 land use allocation shown in Table 3 in the previous chapter.

Table 6: Average Weekday Person Trip Rates

Land Use	Average Weekday Trip Rate /a/	Primary Trip Share /b/	Prelim-inary EHU Factor /c/	Land Use Category From Source Document	
				Average Daily Trip Rate *(Source: ITE)*	Primary Trip Share *(Source: SANDAG)*
Residential					
Single Family	9.52	100%	1.00	Single Family Detached	Residential
Multi-Family	6.65	100%	0.70	Apartment	Residential
Nonresidential					
Retail/Commercial	84.06	47%	4.15	NA	NA
Eating & Drinking	*240.32*	*47%*	*11.86*	*/d/*	*Community Shopping Center*
All Other	*42.70*	*47%*	*2.11*	*Shopping Center*	
Hotel/Motel	11.13	58%	0.68	/e/	Lodging
Office	11.03	77%	0.89	General Office	Commercial Office
Institutional	18.59	65%	1.28	NA	NA
Education	*16.03*	*68%*	*1.15*	*/f/*	*/f/*
Non-local Gov't	*27.92*	*50%*	*1.47*	*Government Office Complex*	*Government*
Hospital	*29.26*	*64%*	*1.97*	*/g/*	*/g/*
Social Assistance	*1.33*	100%	*0.14*	*Assisted Living*	*Residential*
Cultural	*9.11*	*64%*	*0.61*	*Church*	*Church*
Industrial	6.97	79%	0.58	General Light Industrial	Industrial Park
Warehouse	3.56	92%	0.34	Warehousing	Industrial Plant

/a/ Average weekday person trip ends across all modes per housing unit or per 1,000 building square feet. Rates for Retail/Commercial and Institutional categories are based on rates for subcategories weighted by 2015 land use shown in Table 3.

/b/ Primary trip ends are origins or final destinations. Excludes intermediate stops (pass-by and diverted trip ends).

/c/ Equivalent housing units (EHU) are the adjusted trip rates (ADT x new trip share) normalized so one single family unit equals one EHU. Residential EHUs are expressed per housing unit and nonresidential EHUs are express per 1,000 building square feet.

/d/ Average of rates for Quality Restaurant, High-Turnover Restaurant, and Fast-Food Restaurant with Drive-Through Window categories.

/e/ Average of rates for Hotel and Motel categories. ITE rates per room converted based on 620 square feet per room.

/f/ Average of rates for Elementary School, Middle/Junior High School, High School, Junior/Community College categories weighted by number of grade levels (15 grade levels, kindergarten through two-year community college).

/g/ Average of rates for Hospital and Medical-Dental Office Building (representing hospital-related facilities) weighted 30%/70%, respectively.

Source: Institute for Transportation Engineers (ITE), Trip Generation (9th Edition), 2012; San Diego Association of Governments (SANDAG), *Brief Guide of Vehicular Trip Generation Rates*, April 2002; Table 3.

Based on the trip generation rate and the primary trip share adjustment, Table 6 calculates a preliminary travel demand factor for each land use category and subcategory. Travel demand factors are expressed as equivalent housing units (EHU). EHUs provide a method to aggregate demand across all residential and nonresidential development by converting trip generation rates to travel demand per housing unit for residential uses and per 1,000 building square feet for nonresidential uses. One EHU equals the demand from one single family housing (SFH) unit. EHU factors for all other land uses are calculated relative to one SFH unit.

In the nexus analysis each end of the trip is weighted equally, assigning the land use on each end of the trip the same level of burden on transportation infrastructure. The exception to this equal weighting approach is in the retail/commercial land use category. Retail/commercial development is dependent on spending from residential and other nonresidential development. Consequently, trip ends associated with the retail/commercial land use category are divided into three types based on the source of spending from:

- Residential development within the city
- Other (non-retail/commercial) nonresidential development within the city
- Homes and businesses located outside the city

Table 7 takes the preliminary transportation EHU factors from Table 6 and calculates final transportation EHU factors and total existing (2015) EHU based on the adjustment described above for the retail/commercial land use category. As shown in Table 7, 60 percent and 19 percent of retail/commercial trip ends are associated with spending from residential and other nonresidential development within the city, respectively. Table 7 re-allocates these trip ends to residential and other nonresidential land use categories using these two percentages, and then allocates these trips to individual land use categories based on the relative number of preliminary equivalent housing units in each category. The remaining retail/commercial trip ends remain allocated to the retail/commercial land use category.

Table 7 excludes trip generation by local government. Local government for the purposes of this nexus analysis includes the City of Oakland and the Oakland Unified School District[1]. Local government employment is excluded because local public service demand is reasonably related to private and other public development. Therefore, transportation infrastructure impacts from the growth in local government employment are attributed to growth in private and other public development.

Table 8 shows the estimated growth in travel demand from new development from 2015 to 2040 based on the land use projections presented in Chapter II. Travel demand is anticipated to increased by 23 percent over this period. The transportation impact fee would fund improvements and expansion to citywide transportation infrastructure to accommodate new development's increased travel demands.

[1] For the limited purpose of this footnote, the City of Oakland includes the Port of Oakland**.**

Table 7: 2015 Transportation Equivalent Housing Units (EHU)

Land Use	2015 Land Use *(Housing Units or 1,000 Bldg. Sq. Ft.)*	Prelim-inary EHU Factor	Prelim-inary EHU	Retail Burden Shift /a/		Revised EHU	Final EHU Factor /b/	Final EHU
				Local Spending EHU Share	EHU			
Residential								
Single Family	81,700	1.00	81,700	60%	18,136	99,836	1.00	81,700
Multi-Family	90,000	0.70	63,000		13,985	76,985	0.70	63,000
Total Residential	171,700	0.84	144,700		32,121	176,821		144,700
Nonresidential /c/								
Hotel/Motel[3]	2,600	0.68	1,768	19%	217	1,985	0.62	1,612
Office	26,700	0.89	23,763		2,911	26,674	0.82	21,894
Institutional	30,500	1.28	39,040		4,782	43,822	1.18	35,990
Industrial	8,400	0.58	4,872		597	5,469	0.53	4,452
Warehouse	40,000	0.34	13,600		1,666	15,266	0.31	12,400
Subtotal	108,200		83,043		10,172	93,215		76,348
Retail/Commercial	12,900	4.15	53,535	(79%)	(42,293)	11,242	0.71	9,159
Total Nonresidential	121,100		136,578		(32,121)	104,457		85,507
Total EHU			281,278			281,278		**230,207**

Note: Existing development and EHUs for residential land uses are based on housing units, and EHU rates are per housing unit. Existing development and EHUs for nonresidential land uses are based on 1,000 building square feet, and EHU rates are per 1,000 building square feet.

/a/ Shift of EHUs from retail to non-retail land uses based on the source of retail spending (60 percent from Oakland residents and 19 percent from Oakland non-retail businesses). The remaining retail EHUs (21 percent) are associated with spending from non-Oakland sources.

/b/ Revised EHU divided by existing development and normalized so that one single family unit equals 1.00 EHU.

/c/ Excludes City of Oakland (including the Port of Oakland) and the Oakland Unified School District. See text for explanation.

Source: Hausrath Economics Group (retail spending analysis); Tables 2, 3, and 6.

Table 8: Transportation Demand Growth, 2015-2040

Land Use	2015-2040 Growth (Housing Units or 1,000 Building Sq. Ft.)	Equivalent Housing Unit (EHU) Factor	Transportation Demand (EHU)
Residential			
Single Family	3,300	1.00	3,300
Multi-Family	46,400	0.70	32,480
Nonresidential			
Retail/Commercial	4,400	0.71	3,124
Hotel/Motel	1,000	0.62	620
Office	9,800	0.82	8,036
Institutional	3,600	1.18	4,248
Industrial	2,800	0.53	1,484
Warehouse	2,500	0.31	775
Total			
2015-2040 Growth			54,067
2015			230,207
Increase (%)			23%

Source: Tables 5 and 7.

INVENTORY OF CITYWIDE TRANSPORTATION INFRASTRUCTURE

Fehr and Peers, transportation consultants on the consultant team for this report, identified the citywide multi-modal transportation infrastructure for the purposes of the nexus analysis. This infrastructure is defined as arterials, collectors, and existing and proposed bicycle facilities that provide connectivity between neighborhoods and activity centers within the City, as well as to neighboring communities and regional transportation facilities. This circulation system includes the entire roadway curb-to-curb (vehicle travel lanes, bicycle lanes, and on street parking), as well as adjacent sidewalks, medians, and intersection signalization equipment, plus off-street bicycle and walking paths. This transportation infrastructure excludes local streets used primarily for access to one specific neighborhood or development site.

By focusing on citywide connectivity the same development project regardless of location within the city will have a similar impact on this infrastructure. This approach avoids having to calculate separate impact fees by zone based on development impacts within each zone and between zones. This approach enables impact fee revenues to fund any capital project as long as the project is part of the citywide transportation infrastructure. Fee expenditures need not mirror the relative concentration of citywide transportation infrastructure among sub-areas of the City.

The inventory of Oakland's existing citywide transportation infrastructure is summarized in **Table 9**. Maps depicting the City's citywide transportation infrastructure are shown in **Figures 3 through 8**.

Table 9: 2015 Transportation Infrastructure Inventory

Infrastructure Type	Length	Avg. Width	Area	Units	Unit Cost	Area
Roadways						
Arterials	892,461	52	46,046,000	sq. ft.		
Collectors /a/	628,485	35	21,872,000	sq. ft.		
Bike Boulevards /b/	NA	NA	2,436,000	sq. ft.	-	-
Total			70,354,000	sq. ft.	$ 41	$2,884,510,000
Sidewalks	2,042,000	10	20,420,000	sq. ft.	24	490,080,000
Curb and Gutter	NA	NA	2,439,000	linear ft.	81	197,560,000
Medians	396,000	8	3,316,000	sq. ft.	24	79,580,000
Off-street Paths	135,700	10	1,357,000	sq. ft.	24	32,570,000
Signals	NA	NA	650	Inter-sections	567,000	368,550,000
Total						**$4,052,850,000**

Note: Inventory limited to arterial and collector streets that provide connectivity between neighborhoods and activity centers within the City, and that provide connectivity to neighboring cities and regional transportation facilities. Inventory includes transit-supportive infrastructure such as bus pads, bus bulbs, and signal interconnects. Local streets used primarily for access to one specific neighborhood or development site are not included, including local streets that primarily provide access to activities on lands owned by the Port of Oakland.

/a/ Includes bike lanes.

/b/ Includes existing and future bike boulevards. Area does not overlap with area assigned to arterial and collectors.

Source: Fehr & Peers; Table 10.

As shown in Table 9, based on 2015 replacement costs the total existing value of citywide transportation infrastructure is $4.1 billion. Replacement cost is the current cost of a similar new asset having the nearest equivalent utility as the asset being valued. Unit cost factors used to estimate replacement cost are shown in **Table 10**. These cost factors were developed by City staff with assistance from BKF Engineers, a member of the consultant team that produced this report. These cost factors reflect recent City experience with transportation capital projects.

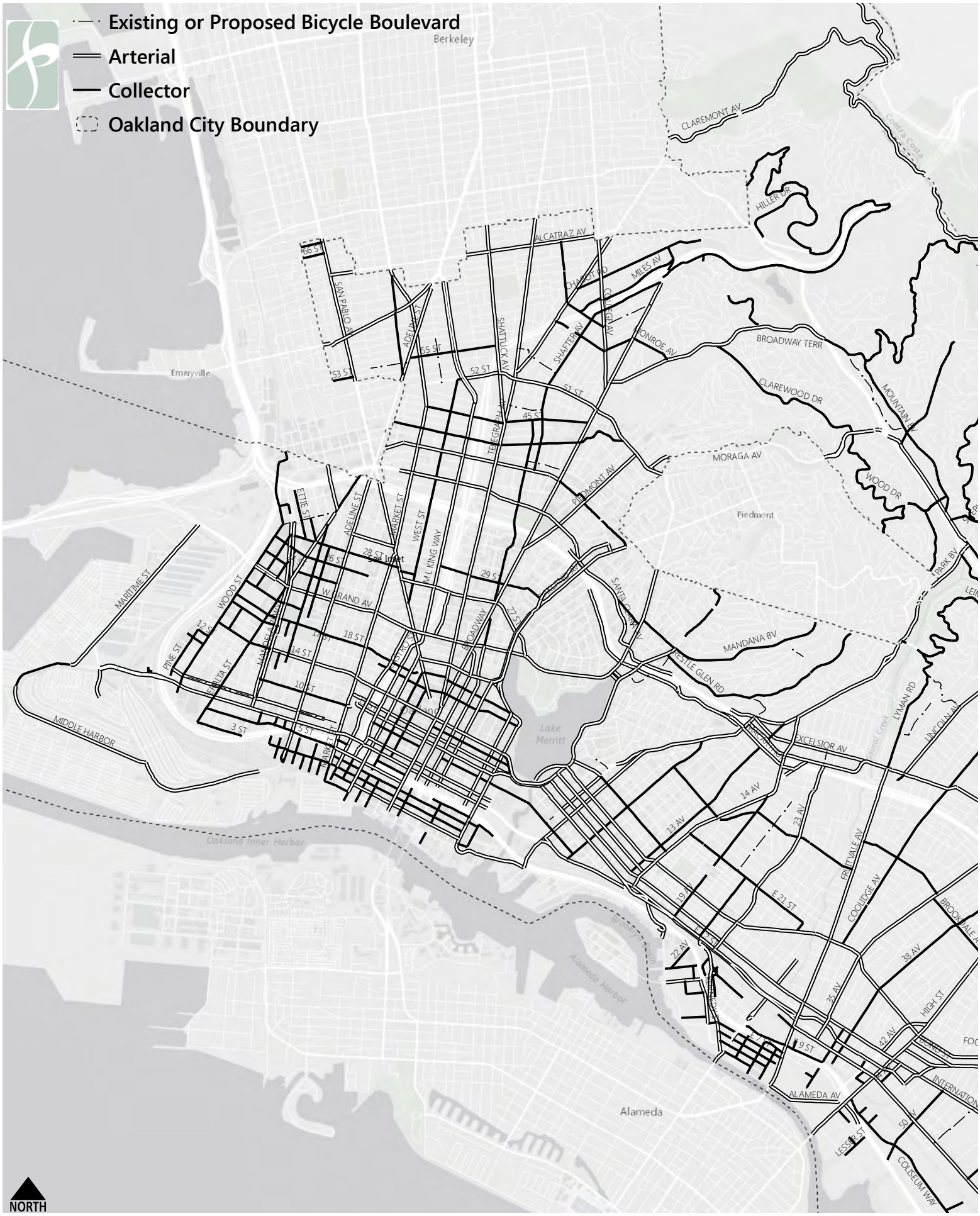


Figure 3

Roadways and Bicycle Boulevards (West)

Figure 4

Roadways and Bicycle Boulevards

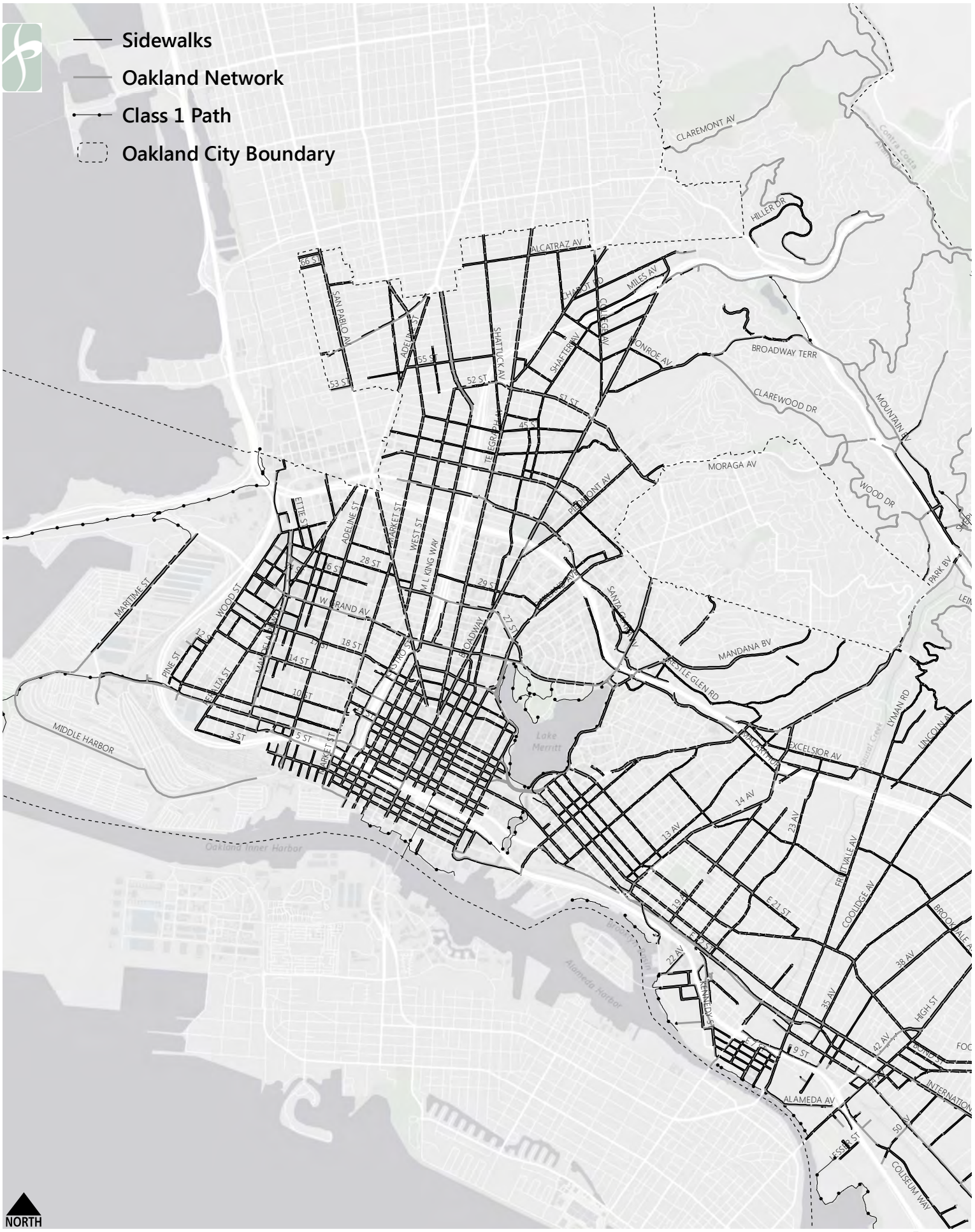


Figure 5

Sidewalks and Paths (West)

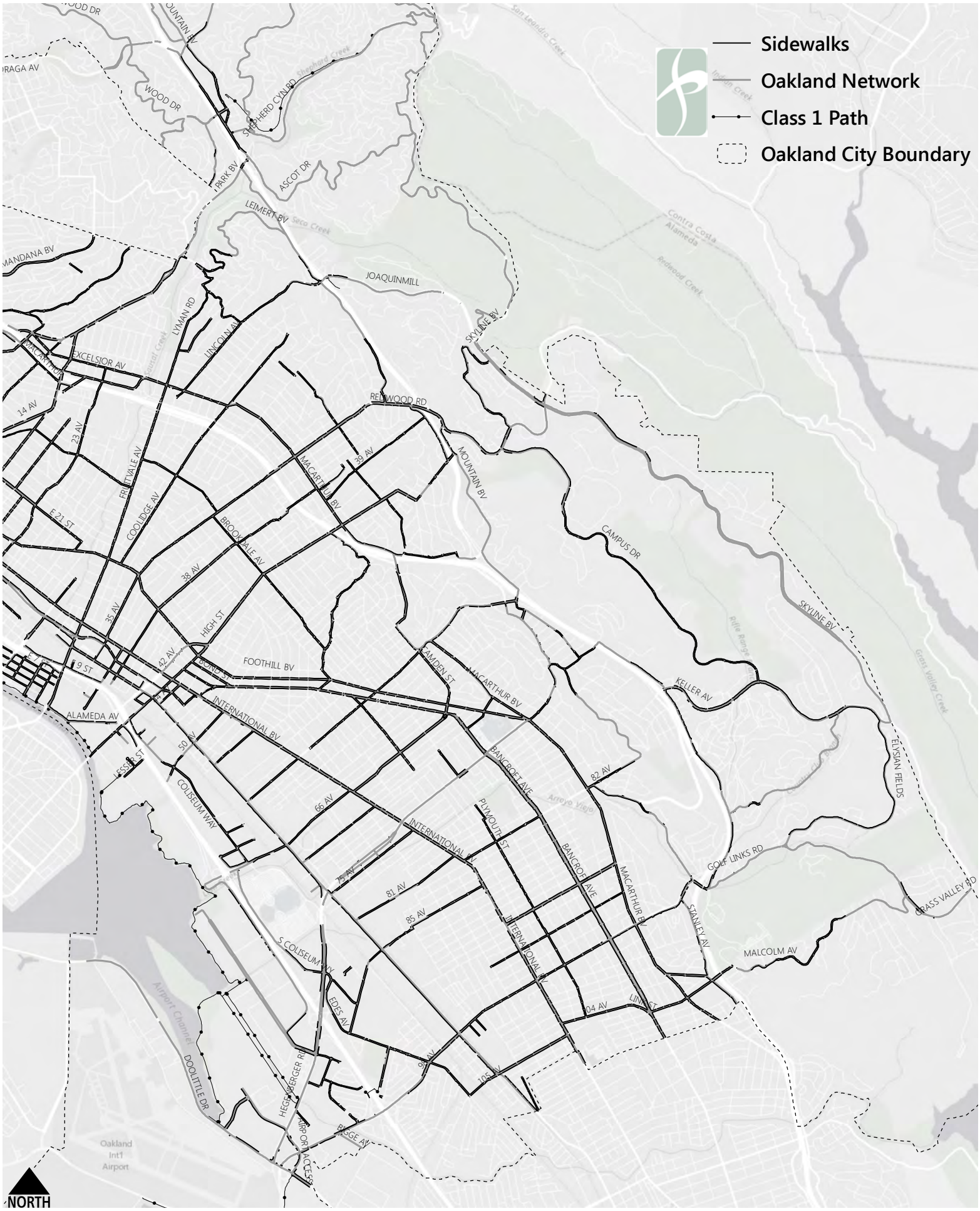


Figure 6

Sidewalks and Paths (East)

Figure 7

Medians (West)

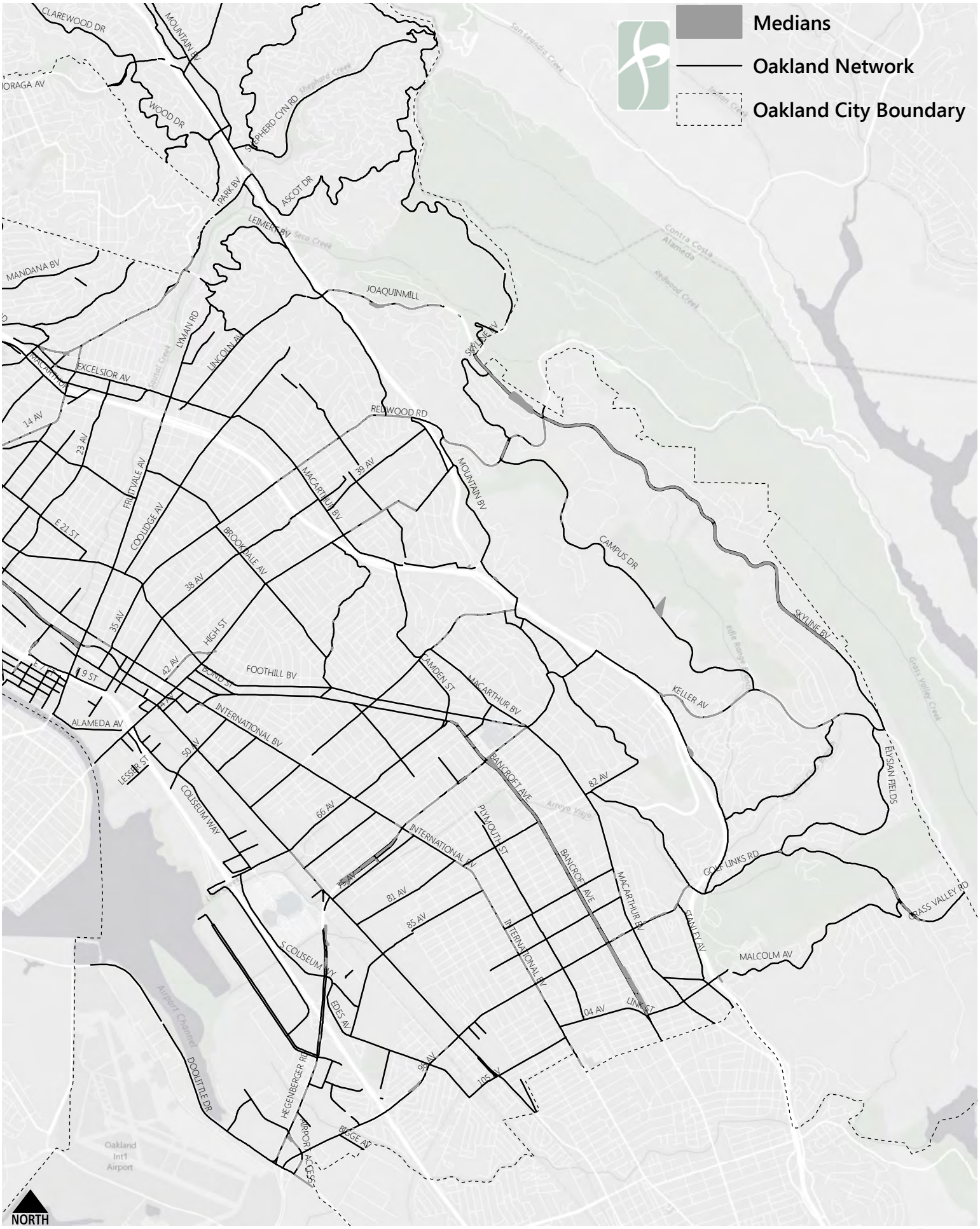


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Figure 8

Medians (East)

Table 10: 2015 Transportation Unit Costs (Replacement Value)

Infrastructure Type	Construction	Project Design & Management /a/	Contingency /b/	Total Unit Cost	Unit
Formula	a	b	c	d = a / (1 - b) * (1 + c)	
Roadways /c/	$ 25	35%	20%	$ 41	sq. ft.
Sidewalks /d/	15	35%	20%	24	sq. ft.
Curb and gutter	50	35%	20%	81	linear ft.
Medians	15	35%	20%	24	sq. ft.
Off-street Paths /e/	15	35%	20%	24	sq. ft.
Signals /f/	350,000	35%	20%	567,000	intersection

/a/ Percent of total cost before contingency.

/b/ Increment added to construction and project design and management costs.

/c/ Includes subgrade grading, 18" aggregate base, 6" asphalt concrete, plus 10% surcharge for curb ramps and driveway aprons. Assumes average street pavement section for an average Traffic Index (residential, collector, arterial), and average R-value of subgrade quality. Does not include: street furniture, street lighting, traffic signals, landscaping, street trees, and storm water facilities.

/d/ Includes 4" concrete over 4" base plus demolition and root barriers.

/e/ Including demolition and root barriers.

/f/ Includes intelligent transportation system elements and readiness (e.g. signal interconnect system).

Source: BKF Engineers; City of Oakland.

Table 9 excludes transportation infrastructure that is not the City's responsibility, including bus stops and signage associated with bus transit provided by the Alameda-Contra Costa Transit District, heavy rail infrastructure associated with the Bay Area Rapid Transit District (BART), and highway infrastructure within the City, including Interstates 580, 880, and 980, that is the responsibility of the California Department of Transportation (Caltrans).

MAXIMUM LEGAL IMPACT FEE

Level of Investment

More travel from new development will increase demands on citywide transportation infrastructure. The nexus between new development and the need for citywide transportation infrastructure is based on maintaining the City's existing level of investment in that

infrastructure as the City grows.[2] The existing level of investment is shown in **Table 11** for each of the infrastructure types shown in Table 9. The level of investment is shown per EHU based on total 2015 transportation EHU from Table 7. This level of investment, for example 306 square feet of roadway per EHU as shown in Table 11, establishes the maximum legal amount that new development can contribute to accommodate increased travel demand.

Table 11: 2015 Transportation Infrastructure Level of Investment

Infrastructure Type	Inventory		Equivalent Housing Units *(EHU)*	Level of Investment *(per EHU)* /a/	Average Unit Replacement Cost	Cost *(per EHU)*
Roadways	70,354,000	sq. ft.	230,307	306	$41	$12,546
Sidewalks	20,420,000	sq. ft.	230,307	89	24	2,136
Curb and Gutter	2,439,000	linear ft.	230,307	11	81	891
Medians	3,316,000	sq. ft.	230,307	14	24	336
Off-street Paths	1,357,000	sq. ft.	230,307	6	24	144
Signals	650	intersections	230,307	3	567,000	1,701
Total						**$17,754**

Note: Inventory includes infrastructure supportive of all travel modes such as bus transit (e.g. bus pads, bus bulbs, and signal interconnects), bicycle lanes, and pedestrian signals.

/a/ Level of investment expressed per EHU for all categories except signals are expressed per 1,000 EHU.

Source: Tables 7, 9, and 10.

Though most of the City's transportation infrastructure investment to date has been in roadways designed for private vehicles (see Table 9), future investments are likely to shift. In a built out urban area such as Oakland it is generally not feasible to widen roadways or intersections to accommodate an increase in vehicle trips. Future investments will need to manage increased travel demand for private vehicle trips as well as encourage increased travel demand for walking, biking, and riding transit.

To allow for flexibility in funding capital projects across all travel modes, Table 11 converts the existing level of investment for each transportation infrastructure type to a cost per EHU, and calculates a total cost per EHU. The total cost per EHU of $17,754 represents the maximum legal amount that new development could be required to contribute to maintain the existing level of investment. Representing new development's obligation as a single dollar amount allows for transportation impact fee revenues to be used for any type of improvement or expansion to the citywide transportation infrastructure.

[2] "Level of investment" is analogous to "level of service" or "facility standard". All three terms reflect quantitative measures used in development impact fee nexus analysis to demonstrate a reasonable relationship between development and the need for improved or expanded public facilities.

Fee Schedule

The total cost per EHU from Table 11 is used to establish the schedule of maximum legal impact fees in **Table 12**.

Table 12: Transportation Maximum Legal Impact Fee

Land Use	Cost per EHU	EHU Factor	Fee	
Residential				
Single Family	$ 17,754	1.00	$ 17,754	per housing unit
Multi-Family	17,754	0.70	12,428	per housing unit
Nonresidential				
Retail/Commercial	$ 17,754	0.71	$ 12.61	per sq. ft.
Hotel/Motel	17,754	0.62	11.01	per sq. ft.
Office	17,754	0.82	14.45	per sq. ft.
Institutional	17,754	1.18	20.95	per sq. ft.
Industrial	17,754	0.53	9.41	per sq. ft.
Warehouse	17,754	0.31	5.50	per sq. ft.

Note: "EHU" is equivalent housing unit.

Source: Tables 7 and 11.

California Government Code Section 66005.1 in the Mitigation Fee Act (the Act) requires a discount for certain types of transportation impact fees imposed on housing development projects that meet specified criteria. First, the need for the fee (one of the findings required by the Act) must be to mitigate vehicular traffic impacts. Second, the housing project must meet specified criteria related to what is commonly considered "transit-oriented development" (TOD) such as being located within a half-mile of a transit station and convenience retail. If these conditions are met, then the fee must be discounted to reflect lower levels of automobile trip generation associated with these types of housing developments.

The transportation impact fee documented in this chapter is not subject to the requirements of Section 66005.1 because the need for the fee is not to mitigate vehicular traffic impacts. Rather, the need for the fee is to address and manage the impacts of all types of additional travel demand from new development including private vehicles, public transit, biking, and walking. Transit-oriented development of the type described in Section 66005.1 may reduce demand for vehicle travel but increases demand for other modes of travel**.** Therefore, there is no justification to discount the transportation impact fee for TOD because the need for the fee is to manage increased travel demand regardless of the mode of travel. The City may use fee revenues for cumulative traffic mitigation measures as one strategy for managing increased travel demand, as further described in Appendix B, but the transportation impact fee does not have to comply with the requirements of Section 66005.1.

IMPLEMENTATION

This section provides procedures for implementation of the transportation impact fee to remain consistent with the nexus analysis and to meet the requirements of the Act. Statutory references are to the Act in Sections 66000 to 66025 of the *California Government Code*.

Fee Accounting

The City should deposit all transportation impact fee revenues into a new restricted transportation impact fee account. Interest earned on fund balances should be credited to the account. See Section 66006(a).

Eligible Use of Funds

To remain consistent with the nexus analysis, fee revenues must be used only for the following purposes:

- **Transportation capital projects:** Fee revenues may be used to fund a capital project or portion of a capital project, including reimbursements to developers who build projects under agreement with the City, that meets all of the following criteria:
  - **Capital project**

    The project must be a capital project in the Streets & Sidewalks or Traffic Improvements categories as defined in the City's *Capital Improvement Program*.
  - **Citywide transportation infrastructure**

    The project must be part of the City's citywide transportation infrastructure as shown in Figures 3, 4, and 5 in this chapter. If the project is on a roadway that is not part of the infrastructure depicted in those figures, the City must make a finding that the project provides connectivity between neighborhoods and activity centers within the City, or to neighboring communities or regional transportation facilities, and is not primarily for access to one specific neighborhood or development site.
  - **Improvement or expansion**

    The project must improve or expand the City's citywide transportation infrastructure to accommodate travel demand from new development. Projects may include traffic calming facilities and other vehicle restrictions to address negative impacts of increased vehicle trips and/or to accommodate increased travel by transit, biking, or walking. Funds may not be used for rehabilitation, maintenance, or operating costs.
- **Mitigation Fee Act costs:** Fee revenues may be used for implementation costs reasonably related to compliance with the Act, including collecting, accounting, and managing expenditure of fee revenues in accordance with the Act, as well as

preparing financial reports and nexus studies required to make any necessary findings and determinations under the Act. (see *Administrative Costs*, below).[3]

Programming Revenues

The City should program existing and projected account balances to specific capital projects in the Streets & Sidewalks and Traffic Improvement categories within its *Capital Improvement Program*, either annually or biannually. Programmed fee revenues should not replace existing identified funding sources. Though not specifically required by the Act, the City should make a good faith effort to program uncommitted funds as expeditiously as possible to demonstrate that new development is benefiting from construction of improved or expanded transportation infrastructure. Programming of funds could include designating a reserve account to accumulate funds over several years for a future capital project, subject to further refinement of the project description and accrual of a sufficient account balance to begin construction.

Inflation Adjustment

The City should adjust the impact fee annually for inflation in the replacement cost of the facilities used in each nexus analysis. Several different inflation indices for construction of buildings and infrastructure are published on a regular basis for this purpose. The City should select one of these indices and use it annually to adjust the fees.

Annual and Periodic Reporting Requirements

The City should comply with the annual reporting requirements under Section 66006(b) related to beginning and ending account balances, revenues received, and capital projects funded.

Following the fifth fiscal year after the first deposit of fee revenue and every five years thereafter, the City should comply with the reporting requirements under Section 66001(d). To comply with this section, the City must demonstrate that there continues to be a reasonable relationship between the fee and the purpose for which it is charged. The City may do this by updating the nexus analysis based on current values for:

- Existing transportation travel demand (Table 7)
- Inventory of citywide transportation infrastructure (Table 9)
- Unit costs of citywide transportation infrastructure (Table 10)
- Level of investment and total cost per equivalent housing unit (Table 11)
- Maximum legal impact fee (Table 12).

[3] See *California Government Code*, section 66014(b).

Administrative Costs

Fee revenues may be used for implementation costs reasonably related to compliance with the Act. These administrative costs include:

- Planning and Building department costs related to imposition of the fee on development projects, plus consulting services for five-year periodic updates to the nexus analysis.
- Finance department costs related to revenue and cost accounting for annual inflation updates and reporting required by the Act.
- Public Works department costs related to capital project planning and budgeting in compliance with eligible uses of funds under the nexus analysis.
- City Attorney costs for legal support to the impact fee program.

Based on our experience with other fee programs these costs range from one to five percent of total fee revenue collected, and are typically approximately two percent. The percentage can vary on an annual basis because the amount of revenue collected can vary from year to year.

Cumulative Traffic Mitigation Measures

Appendix B describes the cumulative traffic impacts caused by nearly all (96 percent) of new development citywide. The term "traffic" impacts rather than "transportation" impacts is used in this context because the traffic impact analysis described in the appendix is focused on vehicle impacts and roadway congestion, as compared to the broader transportation system impact analysis that supports the transportation impact fee. The analysis summarized in Appendix B is based on environmental reviews of projects and plans conducted by the City pursuant to the *California Environmental Quality Act* (CEQA).

The improvements identified to mitigate the cumulative traffic impacts of the projects and plans described in Appendix B meet all the criteria for the eligible use of transportation impact fee revenues described above. Thus, the transportation impact fee provides the City with a mechanism to seek a fair share contribution from new development projects to mitigate cumulative traffic impacts analyzed pursuant to CEQA. See Appendix B for more details.

IV. CAPITAL IMPROVEMENTS

INTRODUCTION

The capital improvements impact fee includes public facilities that support the following public services:

- Fire protection and emergency medical services
- Police protection
- Libraries
- Parks and recreation (including open space)
- Storm drain infrastructure

In this chapter, "public facilities" refers to the land, including parkland and open space, park improvements, buildings, vehicles, furnishings, equipment, and library collection and related infrastructure needed to support the services listed above.

Oakland is not expanding its land area so, similar to transportation infrastructure, there is limited potential to construct new public facilities on vacant land to accommodate new development. Instead the City will need to improve and expand its existing public facilities to serve growth.

This chapter presents the nexus analysis for the capital improvements impact fee under the following sections:

- Need for additional capital funding
- Nexus methodology
- Inventory of citywide transportation infrastructure
- Existing and projected travel demand
- Maximum legal impact fee
- Implementation

NEED FOR ADDITIONAL CAPITAL FUNDING

The City has no dedicated funding source for the types of public facilities included in the capital improvements impact fee. Spending on these types of capital improvements is $1.3 million in the City's current *FY 2015-17 Capital Improvement Program* (CIP), or 2.1 percent of total CIP spending. The entire amount is allocated to disability access projects and is funded by the General Purpose Fund.

Sanitary sewer facilities were included in the scope of work for the nexus analysis but based on further analysis have been excluded from the capital improvements impact fee. Sanitary sewer facilities benefit from a user charge that generates approximately $58 million annually of which

about $18 million is allocated for substantially the same types of improvements that would be funded by the impact fee. Although this funding is inadequate to fund the City's 10 year CIP based on the 2014 Sanitary Sewer Management Plan it is substantially more funding than is available to the other types of facilities included in the capital improvements impact fee. Furthermore, the sanitary sewer user charge could be increased to provide additional funding through a Proposition 218 procedure that requires a notice and protest hearing.

NEXUS METHODOLOGY

The purpose of City's capital improvements impact fee is to accommodate the impact of new development by funding (1) improvements and expansion to the City's public facilities that support fire and police protection, libraries and parks and recreation services, and (2) improvements, expansion, and rehabilitation to the City's public facilities that support storm drain services.

The City is not divided into zones for purposes of calculating the capital improvements fee because each type of public facility to be funded by the fee supports a citywide system of public services. Public safety services (police and fire) are deployed through a system of discrete geographic service areas: districts and beats for police services and station first response areas for fire services. However, personnel and equipment assigned to each of these services areas play an essential role providing backup for incidents in other areas. In addition, the fire and police departments have centrally-deployed resources such as investigative units and emergency command posts. Likewise parks and libraries provide services through a citywide network of facilities. Sports leagues use athletic fields citywide and a neighborhood library user can request books from any branch in the City's system. Finally, the City's storm drain facilities are an interconnected network of pipes and trash capture devices that convey storm runoff from all parts of the city to the Bay.

The first step in the nexus analysis is to identify the existing inventory of public facilities. This inventory represents the level of investment that the City has made to date for the benefit of existing residents and businesses.

The second step in the nexus methodology is to estimate existing and future demand for public facilities. The nexus analysis uses service population, the number of residents and workers by land use, to reflect variations in public service demand among land uses. This approach provides a reasonable relationship between the type of development that would pay the fee, the amount of the fee, and the cost of public facilities needed to accommodate that development.

Growth in residents and workers from new development will increase demands on public facilities. Consequently, the nexus between new development and the need for capital improvements is based on maintaining the City's existing level of investment in existing public facilities as the City grows. Thus the third step in the nexus analysis is to identify the existing level of investment in these public facilities per unit of development. This existing level of investment represents the facility standard that defines new development's maximum potential contribution to improved and expanded facilities needed to accommodate growth. The level of investment is used to develop the schedule of maximum legal impact fees by land use category.

INVENTORY OF PUBLIC FACILITIES

The inventory used as a basis for the capital improvements fee only includes facilities that meet the following criteria:

- Public facility is owned by the City
- City is responsible for improvement and expansion
- Insufficient dedicated revenues exist for capital improvements

Only if a public facility meets all three criteria does a reasonable relationship exist between new development and the need for improvement and expansion.

The inventory of Oakland's existing public facilities and replacement values are shown in **Table 13**. Facilities are grouped under the following types:

- **Buildings**

  Includes major structures providing public services as well as administrative facilities and certain utility buildings. Park maintenance buildings, amenities, and restrooms are included with improved parkland and related replacement costs.

- **Land**

  Land associated with buildings included in the table.

- **Vehicles**

  Includes vehicles associated with fire and police services because of the significant value represented by the vehicle fleets needed to deliver these public services. Trash capture vehicles (street sweepers and vacuum trucks) are included with storms drain facilities.

- **Library collection**

  Includes a comprehensive inventory of materials such as books, periodicals, documents, databases, e-books, and audio and video recordings.

- **Improved parkland**

  Includes developed parks except areas with buildings. Where buildings are located within parks, land area is estimated and included in the "land" category, above.

- **Open space**

  Includes resource conservation areas to protect the natural environment and to provide limited activities such as hiking, nature study, and bird watching.

- **Storm drain**

  Includes pipes that comprise the City's storm drain system and excludes facilities owned by the California Department of Transportation (Caltrans) and the Alameda County Flood Control and Water Conservation District. Also includes trash capture devices, street sweeping vehicles, and vacuum trucks.

Table 13: 2015 Public Facilities Inventory – Detail

	Inventory		Replacement Unit Cost /a/	Total Value ($ mil.)
Fire				
Essential Service	132,405	bldg. sq. ft.	$1,002	$132,670,000
Civic	18,159	bldg. sq. ft.	762	13,840,000
Utility	9,092	bldg. sq. ft.	191	1,740,000
Total Buildings	159,656	bldg. sq. ft.	$929	$148,250,000
Land	767,466	land sq. ft.	$31	23,790,000
Vehicles	111	vehicles	$360,811	40,050,000
Subtotal - Fire				$212,090,000
Police				
Essential Service	237,122	bldg. sq. ft.	$1,002	$237,600,000
Civic	7,001	bldg. sq. ft.	762	5,330,000
Total Buildings	244,123	bldg. sq. ft.	$995	$242,930,000
Land	180,000	land sq. ft.	$31	5,580,000
Vehicles	607	vehicles	$56,046	34,020,000
Subtotal - Police				$282,530,000
Library				
Civic Buildings	209,046	bldg. sq. ft.	$762	$159,290,000
Land	242,810	land sq. ft.	$31	7,530,000
Collection	1,588,900	items	$38	60,420,000
Subtotal - Library				$227,240,000
Parks & Recreation /b/				
Civic Buildings	489,933	bldg. sq. ft.	$762	$373,330,000
Land (for buildings)	2,155,634	land sq. ft.	$31	66,820,000
Improved Parks /c/	26,355,130	land sq. ft.	$63	1,660,370,000
Open Space	71,585,152	land sq. ft.	$1.26	90,200,000
Subtotal - Parks				$2,190,720,000
Storm Drain				
Storm Drain Pipes	2,108,859	linear ft.	$136	$286,030,000
Trash Capture	60	facilities & vehicles	$129,167	7,750,000
Subtotal - Storm Drain	2,108,859	linear ft.	$139	$293,780,000
Total				**$3,206,360,000**

/a/ All unit costs based on current (2015) land values and improvement replacement costs except storm drain pipes and trash capture facilities are based on depreciated replacement costs.
/b/ Includes open space.
/c/ Unit cost includes developed land cost ($31) plus improvement costs ($34).
Sources: Table 14; Appendices B and C.

Additional detail for the public facilities inventory is provided in **Appendices C and D**.

Excluded Facilities

Public facilities owned by the City and excluded from the inventory in Table 13 are described below.

- **Closed facilities**

  Closed facilities are excluded because they are not supporting delivery of public services.

- **Leased facilities**

  Leased facilities are excluded because they are supported by ongoing tax and fee revenue from existing development. New development would provide additional tax and fee revenue to support improvement and expansion of these facilities.

- **Facilities maintained by other agencies and organizations**

  Facilities maintained by other agencies and organizations are not included if the agency or organization is financially responsible for improvement and expansion. Facilities associated with the Oakland Zoo and improvements associated with the Lake Chabot and Montclair municipal golf courses are excluded, for example, though the underlying city-owned land is included in the inventory in Table 13. In addition, the following Port of Oakland facilities and underlying land are excluded because the facilities are maintained and the land is owned by the Port:

  - Fire training facility in Jack London Square
  - Airport fire station (Station 22)
  - Middle Harbor Shoreline Park (38 acres)
  - Metropolitan Golf Course
  - Storm drain facilities that directly serve seaport and airport operations.

Existing Inventory Value

As shown in Table 13, the total existing value of citywide public facilities infrastructure is $3.2 billion. With the exception of storm drain facilities (see next paragraph), estimated value is based on replacement cost, that is, the current cost of a similar new asset having the nearest equivalent utility as the asset being valued.

The value of storm drain facilities is based on depreciated replacement cost. Depreciated replacement cost adjusts replacement cost for physical deterioration, functional obsolescence, and economic obsolescence.[4] Storm drain facilities have substantial existing rehabilitation needs

[4] Physical deterioration is the loss in value resulting from the reduction in the capacity of an asset to continue to provide the goods or services for which it was designed due to wear and tear, etc. Functional obsolescence is the

due to the age and condition, and as a result are under-capacity. More significant to the nexus analysis, storm drain capacity is unlikely to be affected by new development because the extent of the city's impervious surface area that is the direct cause of storm runoff is unlikely to increase. Finally, City storm water regulations require that new development projects that increase runoff mitigate such increases on site, avoiding any impact on the existing storm water system.

Unit cost factors used to estimate replacement cost are shown in **Table 14**. Data sources are described below.

- **Buildings**

  Unit cost factors based on recent capital project data provided by the City with values inflated from year of construction to 2015. Buildings were classified into three types representing different replacement values:

  - Essential service: Includes fire and police facilities that must be constructed to a higher standard due to their emergency service functions.
  - Civic: Includes buildings for administration, park buildings such as community and recreation centers, and libraries.
  - Utility: Includes storage buildings, modular buildings, and the fire department's training center drill tower.

- **Land**

  Represents value of vacant land. Cost factor based on the same data used by Hausrath Economics Group for the *Oakland Affordable Housing Impact Fee Nexus Analysis*. Estimates are conservative (low) based on the lower end of land costs assumed for single family housing prototypes that represent the predominant land use in city (by land area).

- **Park Improvements**

  Unit cost factors for park improvements based on recent capital project data provided by the City with values inflated from year of construction to 2015. Total cost factor equals park improvement factor plus value of vacant land (described above).

- **Storm Drain including Trash Capture Facilities**

  Estimated values developed by BKG Engineers, a member of the consultant team, based on replacement cost depreciated to current (2015) values. See **Appendix D** for details.

A summary of 2015 inventory values by facility type is shown in **Table 15**.

loss in value resulting from inefficiencies in the subject asset compared to a more efficient or less costly asset. Economic obsolescence is the loss in value caused by factors which are external to the asset itself.

Table 14: Public Facilities Unit Costs

Facility Type & Sample Projects	Year Com-pleted	Area *(sq. ft.) /a/*	Final Construction Cost	Unit Cost *(Cost per square foot)* Project Year $	2015 $ /b/	Over-head /c/	Total *(2015 $)*
Essential Service Buildings							
Fire Station #8	2003	9,000	$3,208,232	$356	$552		
Fire Station #18	2011	9,817	6,851,512	698	749		
Total / Average /d/		18,817	$10,059,744		$651	35%	$1,002
Civic Buildings							
81st Avenue Library	2011	22,000	$8,996,711	$409	$439		
Golden Gate Rec. Center	2015	13,423	7,400,000	551	551		
Total / Average /d/		35,423	$16,396,711		$495	35%	$762
Utility Buildings							
Various /e/	2012	NA	NA	$117	$124	35%	$191
Park Improvements							
Lincoln Square	2012	15,682	$839,258	$54	$57		
25th St. Mini Park	2012	10,019	489,487	49	52		
Morcom Rose Garden	2012	130,680	1,237,881	9	10		
Peralta Hacienda Historic Park - De Anza Trail	2013	36,155	821,338	23	24		
Cesar Chavez Park	2013	60,984	1,809,025	30	31		
Linden Park	2015	27,443	321,162	12	12		
Durant Park	2015	13,939	740,000	53	53		
Total / Average /d/		294,902	$6,258,151		$21	35%	$32
Land							
Public facilities & parks /f/	2015	NA	NA	$30	$30	3%	$31
Open Space							
Dunsmuir Heights	2009	64.4	$2,925,000	$1.04	$1.22	3%	$1.26

/a/ Building space for buildings, land area in square feet for park improvements, and acres for open space.

/b/ Based on increase in Engineering News-Record 20-city building cost index between year of completion and 2015.

/c/ For buildings and park improvements represents design and project management. For land represents due diligence and closing costs associated with land transactions. Contingency not included because actual project costs are used.

/d/ Average of individual unit costs, except for park improvements average is weighted by project size because of high costs associated with smaller projects.

/e/ No sample projects available in Oakland. Unit cost estimate based on projects from other California local public agencies.

/f/ Unit cost based on land cost estimates developed by Hausrath Economics Group for Oakland affordable housing nexus analysis.

Sources: City of Oakland; Hausrath Economics Group; Urban Economics.

Table 15: 2015 Public Facilities Inventory – Summary

Public Facility Type	Facility Inventory		Replacement Unit Cost	Total Value *($ million)*
Buildings	1,102,758	bldg. sq. ft.	$838	$923,800,000
Land	3,345,910	sq. ft.	31	103,720,000
Improved Parkland	26,355,130	land sq. ft.	63	1,660,370,000
Open Space	71,585,152	land sq. ft.	1.26	90,200,000
Vehicles /a/	718	vehicles	103,162	74,070,000
Library Collection	1,588,900	items	38	60,420,000
Storm Drain Pipes	2,108,859	linear ft.	136	286,030,000
Trash Capture	60	facilities & vehicles	129,167	7,750,000
Total				$3,206,360,000

/a/ Fire and police vehicles only. Excludes trash capture vehicles.
Sources: Table 13.

EXISTING AND PROJECTED PUBLIC FACILITY DEMAND

Population and employment together represent the "service population" for public facilities. The public services supported by these facilities serve both residential and nonresidential development. Service population is a reasonable indicator of facility demand for public facilities because it is reasonably related to public service demand, and public service demand is reasonably related to public facility needs. Thus there is a reasonable relationship between service population growth and the need for additional public facilities.

Household population is used to represent service demand from residential land uses. Household population excludes persons living in group quarters. Group quarters include, for example, dormitories, adult care facilities, and detention facilities. Group quarters are excluded from the calculation of service population because service demand from these facilities is represented by the employment related to these facilities and therefore included in the employment portion of the service population estimate.

Employment is used to represent service demand from nonresidential land uses. Employment includes employees, partners, and owners, collectively referred to as "workers" in the nexus analysis. Estimates exclude the following types of workers:

- Local public employment (City of Oakland and the Oakland Unified School District[5]) is excluded because local public service demand is reasonably related to private and other public development. Therefore, public facilities impact from growth in local government employment is attributed to growth in private and other public development.

[5] The City of Oakland includes the Port of Oakland.

- On-site construction employment is excluded because it is reasonably related to growth in all other land use categories.
- Home business employment is excluded because it is included in the residential (household) service population.

Surveys by other local government agencies have indicated that service demand from one worker is typically less than demand from one resident. This result is reasonable because nonresidential buildings are typically occupied less intensively (fewer hours of the day) than housing units. These surveys also indicate that the degree to which per worker service demand is less than per resident demand varies by type of public service. Taken as a whole these surveys indicate that, relative to residents: (1) employment should be weighted by a factor less than one, and (2) this weighting should vary depending on the type of public service, before adding employment to residents to calculate service population.

Public protection services (fire and police) are 24-hour services provided to all land uses. Services associated with libraries and park and recreation services are more typically provided during the day. This difference is supported by the results of surveys of service demand that indicate a higher level of demand per worker for public protection compared to libraries and parks. For the purposes of this nexus analysis, storm drain services are considered similar to public protection services in terms of nonresidential land use demand.

Based on the survey data and analysis explained above, this nexus analysis assumes the following worker demand factors (relative to one resident) to calculate service demand for public facilities:

- 0.70 for fire, police, and storm drain services
- 0.20 for library and parks and recreation services

An overall worker demand factor for the nexus analysis is based on these individual demand factors weighted by the City's level of investment in its public facilities. The overall worker demand factor is shown in **Table 16**.

Table 17 calculates total existing (2015) demand for public facilities based on equivalent housing units (EHU). EHU factors are based on the resident or worker density by land use type (residents per housing unit and workers per 1,000 building square feet), and the worker demand factors discussed above. EHUs provide a method to aggregate demand across all residential and nonresidential development by converting service population demand to demand per housing unit for residential uses and per 1,000 building square feet for nonresidential uses. One EHU is equated to the demand from one single family housing (SFH) unit. EHU factors for all other land uses are calculated relative to one SFH unit.

Table 18 shows that based on the land use projections presented in Chapter II, new development is estimated to generate a 25 percent increase in demand for public facilities.

Table 16: Average Demand per Worker

Facility Type	Public Facilities Replacement Value /a/ Amount	Share	Demand per Worker /b/
Fire	$212,090,000	6.6%	0.70
Police	282,530,000	8.8%	0.70
Library	227,240,000	7.1%	0.20
Parks	2,190,720,000	68.3%	0.20
Storm Drain	293,780,000	9.2%	0.70
Total / Average /c/	$3,206,360,000	100.0%	**0.32**

/a/ All values based on current (2015) replacement costs except storm drain facilities are based on depreciated replacement costs.

/b/ Demand per worker is relative to one resident and based on surveys of residential and nonresidential service demand from multiple local jurisdictions.

/c/ Average weighted based on replacement value.

Source: Urban Economics; Table 13.

Table 17: 2015 Public Facilities Equivalent Housing Units (EHU)

Land Use	Density /a/	Worker Weighting Factor	Equivalent Housing Unit Factor /b/	2015 Land Use *(Housing Units or 1,000 Bldg. Sq. Ft.)*	2015 Equivalent Housing Units *(EHU)*
Residential					
Single Family	2.77	1.00	1.00	81,700	81,700
Multi-Family	1.99	1.00	0.72	90,000	64,800
Total Residential				171,700	146,500
Nonresidential					
Retail/Commercial	2.59	0.32	0.30	12,900	3,870
Hotel/Motel	1.11	0.32	0.13	2,600	340
Office	3.08	0.32	0.36	26,700	9,610
Institutional	1.60	0.32	0.18	30,500	5,490
Industrial	2.00	0.32	0.23	8,400	1,930
Warehouse	0.56	0.32	0.06	40,000	2,400
Total Nonresidential				121,100	23,640
Total				292,800	**170,140**

/a/ Residents per housing unit or workers per 1,000 building square feet.

/b/ Density multiplied by working weighting factor and normalized so that one single family unit equals 1.00 EHU. Factor expressed per housing unit or per 1,000 building square feet.

Source: Tables 2, 3, and 16.

Table 18: Public Facilities Demand Growth, 2015-2040

Land Use	2015-2040 Growth *(Housing Units or 1,000 Bldg. Sq. Ft.)*	Equivalent Housing Unit (EHU) Factor	Public Facilities Demand (EHU)
Residential			
Single Family	3,300	1.00	3,300
Multi-Family	46,400	0.72	33,408
Nonresidential			
Retail/Commercial	4,400	0.30	1,320
Hotel/Motel	1,000	0.13	130
Office	9,800	0.36	3,528
Institutional	3,600	0.18	648
Industrial	2,800	0.23	644
Warehouse	2,500	0.06	150
Total			
2015-2040 Growth			43,128
2015			170,140
Increase (%)			25%

Source: Tables 5 and 17.

Table 18 shows the estimated growth in demand for public facilities from 2015 to 2040 based on the land use projections presented in Chapter II. Public facility demand is anticipated to increase by 25 percent over this period. The capital improvement impact fee would fund improvements and expansion to public facilities to accommodate new development's increased demands.

MAXIMUM LEGAL IMPACT FEE

Level of Investment

More residents and workers from new development will increase demands on citywide public facilities. The nexus between new development and the need for public facilities is based on maintaining the City's existing level of investment in those public facilities as the City grows.[6] The existing level of investment is shown in **Table 19** for each of the public facilities types shown in Table 15. The level of investment is shown per EHU based on total 2015 public facilities EHU from Table 17. This level of investment, for example 6,481 building square feet

[6] "Level of investment" is analogous to "level of service" or "facility standard". All three terms reflect quantitative measures used in development impact fee nexus analysis to demonstrate a reasonable relationship between development and the need for improved or expanded public facilities.

per 1,000 EHU as shown in Table 19, establishes the maximum legal amount that new development can contribute to accommodate increased public facilities demand.

The City's public facilities investments to accommodate growth may not necessarily reflect the types of investments made to date. For example, in built out urban areas such as Oakland it may not be cost effective to add new parks on newly-acquired lands. Rather, the City may choose to intensify improvements on existing park lands. To allow for a shift in investment, **Table 19** converts the existing level of investment for each public facility type to a cost per EHU, and calculates a total cost per EHU. The total cost per EHU of $18,851 represents the maximum legal amount that new development could be required to contribute to maintain the existing level of investment. Representing new development's obligation as a single dollar amount allows for public facilities fee revenues to be used for any type of improvement or expansion to existing public facilities.

Table 19: 2015 Capital Improvements Level of Investment

	Facility Inventory		Equivalent Housing Units *(EHU)*	Level of Investment *(per 1,000 EHU)* /a/	Unit Cost	Cost per EHU
Buildings	1,102,758	bldg. sq. ft.	170,140	6,481	$838	$5,431
Developed Land	3,345,910	sq. ft.	170,140	19,666	$31	610
Improved Parkland	26,355,130	land sq. ft.	170,140	154,903	63	9,759
Open Space	71,585,152	land sq. ft.	170,140	420,743	1.26	530
Vehicles /a/	718	vehicles	170,140	4.22	103,162	435
Library Collection	1,588,900	items	170,140	9,339	38	355
Storm Drain Pipes	2,108,859	linear ft.	170,140	12,395	136	1,686
Trash Capture	60	facilities & vehicles	170,140	0.35	129,167	45
Total						**$18,851**

/a/ Fire and police vehicles only. Excludes trash capture vehicles.
Sources: Tables 15 and 17.

Fee Schedule

The total cost per EHU from Table 19 is used to establish the schedule of maximum legal impact fees in **Table 20**.

Table 20: Capital Improvements Maximum Legal Impact Fee

Land Use	Cost per EHU	EHU Factor	Fee	
Residential				
Single Family	$18,851	1.00	$18,851	per housing unit
Multi-Family	18,851	0.72	13,573	per housing unit
Nonresidential				
Retail/Commercial	$18,851	0.30	$5.66	per sq. ft.
Hotel/Motel	18,851	0.13	2.45	per sq. ft.
Office	18,851	0.36	6.79	per sq. ft.
Institutional	18,851	0.18	3.39	per sq. ft.
Industrial	18,851	0.23	4.34	per sq. ft.
Warehouse	18,851	0.06	1.13	per sq. ft.

Note: "EHU" is equivalent housing unit.
Source: Tables 17 and 19.

IMPLEMENTATION

This section provides procedures for implementation of the capital improvements impact fee to remain consistent with the nexus analysis and to meet the requirements of the Mitigation Fee Act (the Act). Statutory references are to the Act in Sections 66000 to 66025 of the *California Government Code*.

Fee Accounting

The City should deposit all capital improvements impact fee revenues into a new restricted capital improvements impact fee account. Interest earned on fund balances should be credited to the account. See Section 66006(a).

Eligible Use of Funds

To remain consistent with the nexus analysis, fee revenues must be used only for the following purposes:

- **Public facilities:** Fee revenues may be used to fund a public facility or portion of a public facility, including reimbursements to developers who build projects under agreement with the City, that meets all of the following criteria:

- **Capital project**

  The project must be a capital project as defined in the City's *Capital Improvement Program*.

- **Public facilities**

  The project must be part of the City's public facilities as defined in this chapter that support fire, police, library, parks and recreation, or storm drain services. Allowable expenditures may include land, including parkland and open space, as well as park improvements, buildings, vehicles, furnishings, equipment, library collections, and all related infrastructure and appurtenances.

- **Improvement or expansion – fire, police, library, parks and recreation facilities**

  If the project supports fire, police, library, or parks and recreation services the project must improve or expand the City's public facilities to accommodate service demand from new development. Funds may not be used for rehabilitation, maintenance, or operating costs.

- **Improvement, expansion, or rehabilitation – storm drain facilities**

  The use of depreciated replacement cost for storm drain facilities reflects a lower facility value than replacement cost, thereby lowering the maximum legal impact fee amount. In return, the use of depreciated replacement cost allows the use of fee revenues for replacement of existing facilities.

  If the project supports storm drain services the project must improve, expand, or rehabilitate the City's storm drain facilities to accommodate service demand from new development. Funds may not be used for maintenance or operating costs.

- **Mitigation Fee Act costs:** Fee revenues may be used for implementation costs reasonably related to compliance with the Act, including collecting, accounting, and managing expenditure of fee revenues in accordance with the Act, as well as preparing financial reports and nexus studies required to make any necessary findings and determinations under the Act. (see *Administrative Costs*, below).[7]

Programming Revenues

The City should program existing and projected account balances to specific capital projects through its capital improvement program, either annually or biannually. Though not specifically required by the Act, the City should make a good faith effort to program uncommitted funds as expeditiously as possible to demonstrate that new development is benefiting from construction of improved or expanded public facilities. Programming of funds could include designating a reserve account to accumulate funds over several years for a future capital project, subject to

[7] See *California Government Code*, section 66014(b).

further refinement of the project description and accrual of a sufficient account balance to begin construction.

Inflation Adjustment

The City should adjust the impact fee annually for inflation in the replacement cost of the facilities used in each nexus analysis. Several different inflation indices for construction of buildings and infrastructure are published on a regular basis for this purpose. The City should select one of these indices and use it annually to adjust the fees.

Annual and Periodic Reporting Requirements

The City should comply with the annual reporting requirements under Section 66006(b) related to beginning and ending account balances, revenues received, and capital projects funded.

Following the fifth fiscal year after the first deposit of fee revenue and every five years thereafter, the City should comply with the reporting requirements under Section 66001(d). To comply with this section, the City must demonstrate that there continues to be a reasonable relationship between the fee and the purpose for which it is charged. The City may do this by updating the nexus analysis based on current values for:

- Inventory of public facilities (Table 13)
- Unit costs of public facilities (Table 14)
- Average demand per worker (Table 16)
- Existing public facility demand (Table 17)
- Level of investment and total cost per equivalent housing unit (Table 19)
- Maximum legal impact fee (Table 20).

Administrative Costs

Fee revenues may be used for implementation costs reasonably related to compliance with the Act. These administrative costs include:

- Planning and Building department costs related to imposition of the fee on development projects, plus consulting services for five-year periodic updates to the nexus analysis.
- Finance department costs related to revenue and cost accounting for annual inflation updates and reporting required by the Act.
- Public Works department costs related to capital project planning and budgeting in compliance with eligible uses of funds under the nexus analysis.
- City Attorney costs for legal support to the impact fee program.

Based on our experience with other fee programs these costs range from one to five percent of total fee revenue collected, and are typically approximately two percent. The percentage can vary on an annual basis because the amount of revenue collected can vary from year to year.

APPENDIX A:
2015 BASELINE CONDITIONS FOR HOUSEHOLDS, POPULATION, EMPLOYMENT, AND LAND USE

PURPOSE

Oakland's Impact Fee Study includes nexus analyses for each of the types of impact fees under consideration. The nexus studies require baseline data for the existing levels of development, households and population, and employment in Oakland. Thus, data collection and analysis were done to prepare a 2015 Baseline for use in the nexus analyses.

As Oakland is a large city, the baseline data were developed for subareas of the city and totaled for the city overall. The spatial analysis provides the ability to consider different impact fee zones related to different physical conditions (hills, slopes, flatlands), different economic market conditions, and differences in land uses and development patterns. It also provides data for the City's recently developed Specific Plan areas.

APPROACH

The 2015 Baseline was developed by Hausrath Economics Group (HEG) drawing from a number of data sources and from earlier analyses done for other Oakland efforts. The approach included the following.

- The most recent data available were collected from recognized government sources and tabulated for subareas of the city. On the residential side, 2010 Census data were collected to identify housing, households, and population. For employment and business activity, LEHD Origin-Destination Employment Statistics provided employment by industry data for 2011 for subareas of the city and the city overall. The data were tabulated for subareas identified as planning areas in the General Plan Land Use Element and for other areas useful in providing data for the City's Specific Plan areas.

- HEG performed analyses to update the most recent baseline data (above) to 2015 conditions in Oakland. For residential, that work focused on (a) identifying the number and types of housing units added since 2010 (based on City staff input and the City's Housing Element Reports to CA HCD), and (b) analyzing changes in vacancy rates from 2010 to 2015 (based on the Census ACS and real estate sources). For employment, 2011 data were extended to 2015 based on changes in employment by industry for Alameda County (from CA EDD) and specifics for growth and development in Oakland over that period (changes in vacancy rates, development in hospital medical centers, retail growth and development, etc.).

- Additional analysis was then done to categorize 2015 employment by industry and subarea into land use categories (retail, office, industrial, etc.) based on a number of sources and HEG's knowledge from prior work in Oakland. Further work was done to translate employment by land use into estimates of the square feet of building space by land use and subarea.

- The detailed subarea data were combined to provide citywide totals. The subarea data also were used to provide data for the City's Specific Plan areas.

Summary tables for the 2015 Baseline follow and include the tables listed below.

- **Table A-1**: Oakland Housing, Households, and Population by Subarea, 2015
- **Table A-2**: Oakland Employment and Space by Land Use and Subarea, 2015
- **Table A-3:** Oakland Employment and Space by Land Use and Industry, 2015
- **Table A-4**: Order of Magnitude Space Estimates for Institutional/Major Facilities Land Use, 2015

Figure A-1 shows a map of the planning subareas.

The data sources are further described at the end of the appendix. **Figure A-2** provides data sources for the housing, households, and population estimates, and in **Figure A-3** provides data sources for estimates of employment and non-residential land uses.

Table A-1: Oakland Housing, Households and Population by Subarea, 2015

Subarea	Total Housing Units	Vacancy Rate	Vacant housing units	Occupied Units/HH	HH Pop Per HH	HH Pop	Group Pop	Total Pop	SF Units	% SF	MF Units	% MF
West Oakland	11,376	6.5%	739	10,637	2.44	25,953	2,085	28,038	3,892	34.21%	7,484	65.79%
Oakland Central	23,647	4.5%	1,064	22,583	1.68	37,868	2,465	40,333	1,870	7.91%	21,777	92.09%
San Antonio	22,594	5.0%	1,130	21,464	2.58	55,444	643	56,087	6,193	27.41%	16,401	72.59%
Fruitvale	14,565	4.5%	655	13,910	3.14	43,654	663	44,317	7,333	50.34%	7,232	49.66%
Central East Oakland	16,621	5.5%	914	15,707	3.01	47,231	974	48,205	10,626	63.93%	5,995	36.07%
Elmhurst	21,642	6.5%	1,407	20,235	3.29	66,538	582	67,120	15,018	69.39%	6,624	30.61%
North Oakland	24,781	4.0%	991	23,790	2.03	48,318	953	49,271	9,808	39.58%	14,973	60.42%
North Hills	12,593	3.4%	428	12,165	2.37	28,850	171	29,021	11,135	88.43%	1,458	11.57%
Lower Hills	17,422	4.0%	697	16,725	2.20	36,843	132	36,975	10,248	58.82%	7,174	41.18%
South Hills	6,498	3.8%	247	6,251	2.38	14,896	395	15,291	5,584	85.93%	914	14.07%
Grand Total	171,739	5.06%	8,273	163,466	2.48	405,595	9,063	414,658	81,706	47.58%	90,033	52.42%

Source: Hausrath Economics Group based on approach and sources described in this Appendix.

Table A-2: Oakland Employment and Space by Land Use and Subarea, 2015

Subarea	Retail/ Com'l	Eating & Drinking	Hotel/ Motel	Office		Lt. Ind'l	Ind'l/Transp/ WH/Logistics	Institutional/Major Facilities			TOTAL	% Total
				Local Gov't	Rest	Sm. Mfg.		Local Gov't	Non-Local Gov't	Private		
Harbor	37	25	-	4	384	238	2,019	-	-	83	2,790	1.27%
West Oakland	968	252	-	4	979	2,364	2,782	-	100	594	8,043	3.68%
Oakland Central	9,136	3,584	884	5,810	58,243	1,641	180	5,187	5,242	5,579	95,486	43.64%
San Antonio + Fruitvale Combined	2,957	1,250	414	-	2,803	4,077	2,249	-	2,140	2,757	18,647	8.52%
East Oakland (CE+EH+Rest AP)	3,255	981	1,353	28	7,833	6,799	11,401	50	350	4,616	36,666	16.76%
Airport - Below Doolittle	64	219	-	1	14	6	3,515	60	-	64	3,943	1.80%
North Oakland	2,987	2,640	40	-	7,776	937	52	321	3,550	6,492	24,795	11.33%
North Hills	1,651	964	237	-	1,639	103	-	-	13,044	2,067	19,705	9.00%
Lower Hills	1,322	615	12	-	1,849	410	-	-	-	724	4,932	2.25%
South Hills	333	184	-	-	598	86	-	33	1,927	660	3,821	1.75%
TOTALS	**22,710**	**10,714**	**2,940**	**5,847**	**82,118**	**16,661**	**22,198**	**5,651**	**26,353**	**23,636**	**218,828**	100.00%
% Total	10.38%	4.90%	1.34%	2.67%	37.53%	7.61%	10.14%	2.58%	12.04%	10.80%	100.00%	
Approximate Building Space												
Average densities* (sq. ft. per E)	450	250	900	400	325	500	1,800	941	596	622		
Building Space (gross sq. ft.)	10,219,500	2,678,500	2,646,000	2,338,800	26,688,350	8,330,500	39,956,400	5,316,600	15,709,300	14,704,650	128,588,600	

*Averages for range of types of existing space in each land use category

Source: Hausrath Economics Group based on approach and sources described in this paper

Table A-3: Oakland Employment and Space by Land Use and Industry, 2015

Industry (NAICS)	Retail/ Com'l	Eating & Drinking	Hotel/ Motel	Office		Lt. Ind'l	Ind'l/Transp/ WH/Logistics	Institutional/Major Facilities			TOTAL
				Local Gov't	Rest	Sm. Mfg.		Local Gov't /a/	Non-Local Gov't /a/	Private /a/	
Ag/For/Fish	-	-	-	-	18	336	-	-	-	-	354
Mining/Quarrying	-	-	-	-	-	3	13	-	-	-	16
Utilities	7	-	-	-	2,159	114	237	-	-	-	2,517
Construction	47	-	-	-	1,997	2,276	2,636	-	-	1,161	8,117
Manufacturing	30	-	-	-	1,087	3,541	3,617	-	-	-	8,275
W. Trade	20	-	-	-	3,084	1,877	2,628	-	-	-	7,609
R. Trade	11,639	-	-	-	52	525	205	-	-	-	12,421
Transp & WH	15	-	-	-	2,940	279	11,106	-	2,340	-	16,680
Info	2	-	-	-	2,858	56	-	-	-	-	2,916
Fin. & Insur	1,889	-	-	-	3,172	-	-	-	-	-	5,061
R E	925	-	-	-	1,627	-	-	-	-	-	2,552
Prof, Sci, Tech Serv.	114	-	-	-	15,165	127	-	-	-	-	15,406
Mgmt	49	-	-	-	8,649	10	200	-	-	-	8,908
Admin & Support/Waste Mgmt	480	-	-	-	8,636	2,889	675	-	-	640	13,320
Ed. Serv.	60	-	-	-	3,351	51	-	5,007	14,754	4,634	27,857
Health Care & Soc Assist	707	-	-	-	14,210	70	-	-	5,650	12,172	32,809
Arts, Ent, Rec	1,393	-	-	-	150	83	99	130	1,459	2,020	5,334
Accom & Food Serv.	-	10,714	2,940	-	-	-	-	-	-	469	14,123
Other Serv.	5,333	-	-	-	4,905	4,373	782	60	-	2,540	17,993
Public Admin	-	-	-	5,847	8,058	51	-	454	2,150	-	16,560
TOTALS	**22,710**	**10,714**	**2,940**	**5,847**	**82,118**	**16,661**	**22,198**	**5,651**	**26,353**	**23,636**	**218,828**
Approximate Building Space											
Average densities* (sq. ft. per E)	450	250	900	400	325	500	1800	941	596	622	
Building Space (gross sq. ft.)	10,219,500	2,678,500	2,646,000	2,338,800	26,688,350	8,330,500	39,956,400	5,316,600	15,709,300	14,704,650	128,588,600

*Averages for range of types of existing space in each land use category

/a/ See Table 3A for the details on uses included and employment densities

Source: Hausrath Economics Group based on approach and sources described in this paper.

Table A-4: Order of Magnitude Space Estimates for Institutional/Major Facilities Land Uses

NAICS/Land Use	Local Gov't			Non-Local Gov't			Private		
	Employment	Density	Space	Employment	Density	Space	Employment	Density	Space
Construction									
On-site Work							1,161	-	-
Transp & WH									
Public Transit (BART, AC Transit), P.O				2,340	1,800	4,212,000			
Admin & Support									
At Coliseum Complex /a/							640	500	320,000
Education									
OUSD	5,007	1,000	5,007,000						
UCB-related/lab				12,944	400	5,177,600			
Community Colleges				1,410	1,000	1,410,000			
Job Traning				100	400	40,000			
Other Eductaion				300	1,000	300,000			
Priv. & Religious Schools							4,634	1,000	4,634,000
Health Care & Social Assistance									
Hospitals & related				5,600	450	2,520,000	8,287	450	3,729,150
Social Services & Assistance				50	450	22,500	3,885	450	1,748,250
(child care, in-home care, rest homes, shelters, etc.)									
Arts, Entertainment, Recreation									
Parks/Sports	130	800	104,000						
Zoo, Fairyland, Chabot Sci., Regional Parks, etc.				1,459	800	1,167,200			
Coliseum /a/							1,239	800	991,200
Country Clubs, Recreation							781	800	624,800
Food Service									
Coliseum /a/							469	250	117,250
Other Services									
Airport-related	60	400	24,000						
Churches, cemetaries, etc.							2,540	1,000	2,540,000
Public Administration									
Libraries/Recreation	454	400	181,600						
County Courthouse & facilities				2,000	400	800,000			
E. Bay Reg. Parks Admin				150	400	60,000			
TOTAL	5,651	941	5,316,600	26,353	596	15,709,300	23,636	622	14,704,650

/a/ Space at Coliseum Complex is not a useful measure. Typically measured by numbers of seats, not sq. ft.

Source: Hausrath Economics Group based on approach and sources described in this paper.

Figure A-1: Planning Area Boundaries

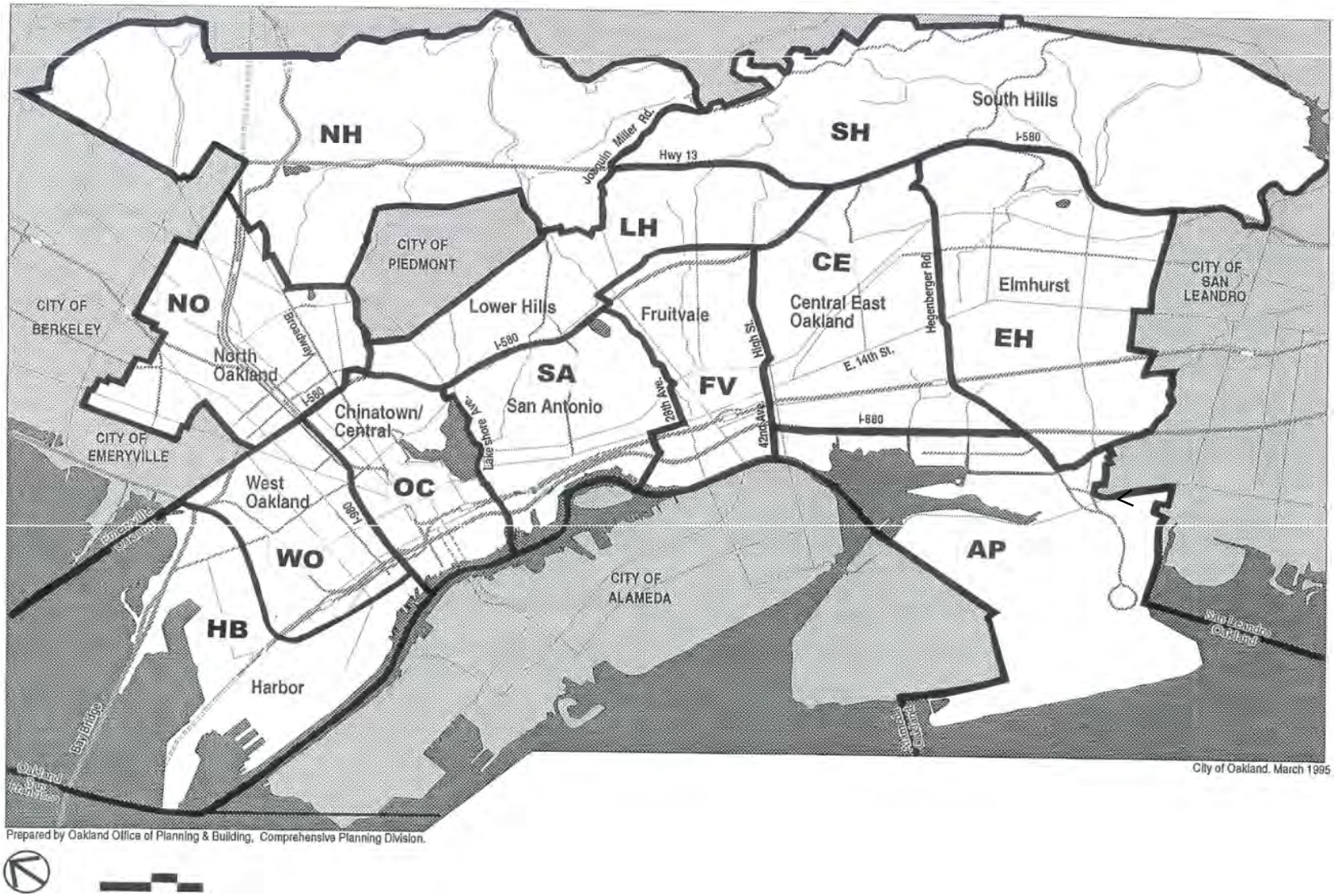

Figure A-2: Sources for 2015 Baseline for Housing, Households, and Population

U.S. Census Bureau, 2010 Census data.

Alameda County Transportation Commission (ACTC), Projections 2013 land use database, 2010 Census data for households and population as allocated to TAZs in Oakland.

City of Oakland, Housing Element Progress Reports to CA HCD, 2010, 2011, 2012, 2013, and 2014, with further input from Planning (Devan Reiff) and Housing (Maryann Sargent).

City of Oakland, Residential Building Permit Data, 2010-2014.

U.S. Census Bureau, American Community Survey (ACS) reports on housing vacancy rates in Oakland since 2010.

Various Real Estate Company Reports on recent housing vacancy rates in Oakland.

Association of Bay Area Governments (ABAG), *Projections 2013.*

Oakland Specific Plans, housing unit counts and household and population estimates (if available) for plan base years.

Figure A-3: Sources for 2015 Baseline for Employment and Associated Land Use and Space Estimates

U.S. Census Bureau, LEHD Origin-Destination Employment Statistics (LODES), OnTheMap application for Oakland. Provided employment by industry for different subareas and the city in total.

California Employment Development Department (EDD), Industry Employment for Alameda County, March 2013 Benchmark. Used to extend 2011 employment data for Oakland to 2015 along with other information.

Hausrath Economics Group and City of Oakland, numerous sources and prior Oakland analyses provided input for allocating employment by industry and subarea to employment by land use and subarea.

Oakland Specific Plans, employment estimates by land use for Plan base years. (HEG prepared the employment by land use for three of the Specific Plans and used that work for this effort.)

Association of Bay Area Governments (ABAG), *Projections 2013*.

Hausrath Economics Group, employment density factors for land uses and developments in Oakland.

DTZ/Cassidy Turley, East Bay Oakland Market Reports, First Quarter 2015, provided space Inventories for office and industrial space.

APPENDIX B:
CEQA CUMULATIVE TRAFFIC MITIGATION COSTS

This appendix documents the cost of measures needed to mitigate the cumulative traffic impacts from 96 percent of new development within the City of Oakland. The purpose of this appendix is to calculate the fair share cost of these cumulative mitigation measures if spread across all development identified as causing these impacts.

Funding the cumulative mitigation measures described in this appendix are an eligible use of transportation impact fee revenues. Thus, the City may decide to collect the fair share cost of these cumulative mitigation measures through its transportation impact fee (see Chapter III). Using the transportation impact fee to spread cumulative mitigation costs across all development projects would eliminate ad hoc negotiations between the City and a development project over funding specific mitigation measures triggered by the project. Instead, cumulative mitigation measure costs would be spread fairly across all development projects contributing to these impacts. In addition, this approach would increase certainty for developers regarding each development project's responsibility for funding cumulative traffic mitigation measures.

CURRENT SITUATION

The City's current approach to mitigating the traffic impacts of new development is described below. This approach reflects common practices among cities in California.

California Environmental Quality Act

The *California Environmental Quality Act* (CEQA) requires that the City evaluate the environmental impacts of a development project or land use plan. The City conducts this evaluation at various levels of geographic scale:

- For the city as a whole as part of its General Plan
- For subareas of the city when preparing specific plans or other land use plans (such as the Broadway-Valdez District Specific Plan)
- For specific development projects.

The City applies thresholds to define a "significant" impact. The City's current thresholds for traffic impacts are based on level of service (LOS) for vehicle congestion. LOS is measured based on the amount of vehicle delay that occurs as more vehicles use the same the roadway. In Oakland most instances of vehicle congestion impacts caused by new development occur at intersections. As a result, most of the mitigation measures associated with new development in Oakland are intersection improvements such as adding traffic signals, changing the timing of existing signals, and re-configuring or adding turning lanes.

Traffic impact analyses are conducted as part of environmental impact reports (EIR) prepared by the City. An EIR typically evaluates impacts under the following land use scenarios:

- **Existing plus project scenario:** Existing conditions plus the proposed development project.
- **Cumulative near-term growth plus project scenario:** Existing conditions plus the proposed development project and other near-term development, typically projects within or nearby the study area and that are already identified in the planning process.
- **Cumulative long-term growth plus project scenario:** Existing conditions plus the proposed development project and cumulative long-term development. Cumulative development typically includes projects included in the "near-term growth plus project" scenario described above, plus a projection of total development over a long range planning horizon within the larger region surrounding the study area.

For area plans, the land use scenario for the "proposed development project" is the amount of new development in the growth scenario associated with the land use policies proposed for the study area. For individual development projects, the "proposed development project" is the project itself.

If impacts from a proposed development project, or growth scenario in the case of area plans, are significant, the City must require the project to implement mitigation measures to reduce impacts to less-than-significant levels. Impacts may be "project impacts" or "cumulative impacts".

- **Project impacts:** Caused solely by the proposed project including, for example, directly-related congestion, safety, and site access impacts that are on site or adjacent to the development site.
- **Cumulative impacts:** Caused by the proposed project and cumulative development (both near-term and long-term) including, for example, improvements to roadways and intersections that may not be directly adjacent to the proposed project but are affected by vehicle trips associated with the project.

Funding Traffic Mitigation Measures for Cumulative Impacts

If a significant traffic impact can be reduced or avoided through a feasible mitigation measure, the City requires the development project that causes the impact to fund the associated mitigation measure. The development project responsible for the impact is the project that causes LOS to decline below the threshold value that defines a significant impact. Thus a development project that only contributes a small share of the cumulative number of new vehicles may have to fund the entire cost of the associated mitigation measure if the project tips LOS below the threshold. Moreover, the identification of required mitigation measures and their estimated cost is often not known until late in the development approval process, leading to ad hoc negotiations between the developer and the City, and adding uncertainty for investors and the developer.

Many cities in California fund mitigation measures with impact fee programs. Under this approach, development project may still be solely responsible for funding measures to mitigate significant project impacts (see above for description). However, responsibility for funding measures to mitigate significant cumulative (both near-term and long-term) impacts are funded by impact fee revenues, spreading the cost of those measures across multiple development projects.

Oakland has one existing traffic impact fee, the Southeast Oakland Area Traffic Impact Fee (SE Area TIF). The fee was adopted in 2006 primarily to fund mitigation measures identified with the Leona Quarry development project. The City identified an area surrounding the project that included cumulative development that would contribute to the significant impacts associated with the Leona Quarry project. The area is an approximately 1.5-mile corridor bisected by Interstate 580 from the Seminary Avenue interchange to the 98th Avenue interchange. All development within this area is subject to the SE Area TIF fee and the fee will generate sufficient revenues to fund all traffic mitigation measures.

The advantages of using a traffic impact fee to fund CEQA mitigation measures include:

- **Fair share funding:** Instead of a development project paying the full amount of any triggered cumulative impact mitigation measure, all projects associated with traffic impacts pay a fair share of the total cost of related mitigation measures.
- **Certainty:** Instead of a development project being subject to ad hoc negotiations for funding mitigation measures after project approvals, the cost is known up-front, thus increasing certainty regarding the cost of mitigation measures.
- **Reduced costs:** Instead of a development project having to fund analysis of cumulative traffic impacts, for many projects there would be no need for such analysis as long as the prior environmental analysis that identified the mitigation measures remains valid. However, the project would still analyze and be responsible for funding project impacts.

Potential Changes to CEQA Traffic Impact Analysis

The State of California Governor's Office of Planning and Research recently issued a revised draft proposal for changing the guidelines for evaluating traffic impacts under CEQA.[8] In general, the draft revised guidelines shift the analysis of traffic impacts from congestion to vehicle miles travelled (VMT). If adopted by the State and implemented by the City, the traffic impacts of new development projects may change substantially. The approach described in the next section of this appendix is based on the City's current approach to environmental review and could be adapted to address changes in mitigation measures should the City adopt new guidelines in the future.

[8] Governor's Office of Planning & Research, *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA*, January 20, 2016.

CUMULATIVE TRAFFIC IMPACT ANALYSIS

The City has conducted a substantial number of traffic impact analyses at both the geographic scale of subareas (e.g. specific or area plans) as well as large individual development projects. Most of these analyses have been conducted in the last five years since 2011. Taken together, these impact analyses provide documentation of traffic impacts across a large contiguous subarea of the City. This subarea includes substantially all new development in the City within the 2040 planning horizon of this Impact Fee Nexus Study. Thus the City has the opportunity to combine the results of these analyses of cumulative impacts and associated traffic mitigation measures to develop a single fair share cumulative mitigation measure cost for almost all new development projects citywide.

Cumulative Traffic Impact Analysis Study Area

The analysis of the cumulative traffic impacts of new development was based on a review of 26 EIRs and one impact fee study (the SE Area TIF Study described above). The EIRs were prepared for the City's General Plan, various area plans, and large development projects. This document review also included nine additional area plans and transportation studies but these studies were not conducted pursuant to CEQA and therefore did not include any traffic mitigation measures. A complete list of all the documents reviewed for this analysis is provided in **Figure B-1**.

The study areas for each of the EIRs and impact fee study are overlapping. The combined Cumulative Traffic Analysis Study Area includes nearly all anticipated new development through 2040. **Figure B-2** shows the boundaries of the cumulative traffic impact analysis study area based on the environmental documents reviewed. The figure also shows the location of the cumulative traffic mitigation measures identified in these documents.

Table B-1 shows the allocation of citywide growth in housing units and building square feet inside and outside the cumulative traffic analysis study area. The allocation is based on estimates of growth at the same level of planning subareas and land use categories used to establish 2015 Baseline conditions and presented in Appendix A. See Chapter II for an explanation of the source of projections for citywide growth. **Table B-2** shows the allocation of citywide growth based on equivalent housing units (EHUs). See Chapter III for explanation of transportation EHU rates and their derivation. As shown at the bottom of Table B-3, the cumulative traffic analysis study area includes 96 percent of citywide growth.

Traffic Mitigation Measures

Not all types of traffic mitigation measures identified in the source documents listed in Table B-1 were included in this cumulative traffic impact analysis. The types of measures included depended on the type of source document as explained below:

- **General Plan EIR, Area Plan EIRs, and SE Oakland Area Traffic Impact Fee Study**

Include all existing plus project, cumulative near-term growth plus project, and cumulative long-term growth plus project mitigation measures. All mitigation measures are related to the growth scenario for the respective EIR study area and therefore are not caused by a specific development project.

- **Project EIRs**

  Include only cumulative near-term growth plus project and cumulative long-term growth plus project mitigation measures and exclude existing plus project mitigation measures. The latter are excluded because they are exclusively related to the project and therefore not related to all development citywide.

The total cost of traffic mitigation measures identified in the Cumulative Traffic Analysis Study Area is $51,440,000. Costs for mitigation measures available from the source document were inflated to 2015 dollars. Costs for the remaining mitigation measures were estimated based on the same unit cost factors used to value the transportation system and presented in Chapter III.

The cost per EHU is shown in **Table B-3** based on the total cost of traffic mitigation measures and the total growth in EHUs within the Cumulative Traffic Analysis Study Area from Table B-2. **Table B-4** shows the fair share cost of mitigation measures by land use category based on the EHU factors used for the transportation nexus analysis (see Chapter III).

As explained above, the fair share cost per unit of development shown in Table B-4 applies to 96 percent of projected long-term growth in the City. Consequently, this cost per unit is unlikely to differ significantly for development projects occurring outside the study area if cumulative growth, the associated traffic impacts, and the related mitigation measures were included in this traffic impact analysis. Thus, the City may use the fair share cost in Table B-4 as a reasonable estimate of the cost of cumulative near-term growth plus project and cumulative long-term growth plus project mitigation measures for development projects located outside the cumulative traffic impact analysis study area. As described previously, this traffic impact analysis did not include mitigation measures for project impacts (existing plus project CEQA scenario).

Table B-5 provides a complete list of all mitigation measures and costs included in this analysis.

Figure B-1: Cumulative Traffic Analysis Source Documents

General Plan EIRs

1. Land Use and Transportation Element DEIR (1998)

Area Plan EIRs

2. Broadway/MacArthur/San Pablo (BMSP) Redevelopment DSEIR (2011)
3. Broadway Valdez District Specific Plan DEIR (2013)
4. Central City East Redevelopment Plan DEIR (2003)
5. Central Estuary Implementation Guide DSEIR (2012)
6. Coliseum Area Specific Plan DEIR (2014)
7. Jack London Square Redevelopment Project Addendum (2014)
8. Lake Merritt Station Area Plan DEIR (2014)
9. Proposed Amendments to the Central District Urban Renewal Plan DEIR (2011)
10. West Oakland Specific Plan DEIR (2014)

Project Plan EIRs

11. 1800 San Pablo SEIR (2012)
12. 325 7th Street Project DEIR (2010)
13. ABSMC Summit Campus Seismic Upgrade and Master Plan DEIR (2009)
14. Broadway-West Grand Mixed Use Project Addendum (2013)
15. Children's Hospital and Research Center Oakland Master Plan DEIR (2014)
16. Emerald Views DEIR (2011)
17. Fruitvale Transit Village Phase 2 DEIR (2010)
18. Gateway Community Development Project DEIR (2007)
19. Kaiser Center Office Project DEIR (2010)
20. MacArthur Transit Village EIR (2008)
21. Oak Knoll DSEIR (2007)
22. Oak to Ninth Avenue Project DEIR (2005)
23. Oakland Army Base Project IS/Addendum (2012)
24. Oakland City Center Project DEIR (2000)
25. Oakland Kaiser Medical Center Master Plan DEIR (2006)
26. Safeway Redevelopment Project Broadway at Pleasant Valley Avenue DEIR (2013)

Impact Fee Studies

27. Southeast Oakland Area Traffic Impact Fee (2006)

Plans and Studies Not Subjected to Environmental Review

1. 20th Street Complete Street Study (Draft 2013)
2. A Community Based Transportation Plan for MacArthur Boulevard (2011)
3. Caldecott Tunnel Settlement Agreement Final Project List (2011)
4. Harrison Street/Oakland Avenue Corridor CBTP (2009)
5. Redwood Road & 35th Avenue Traffic Study (2011)

Figure B-2: Cumulative Traffic Impact Analysis Study Area

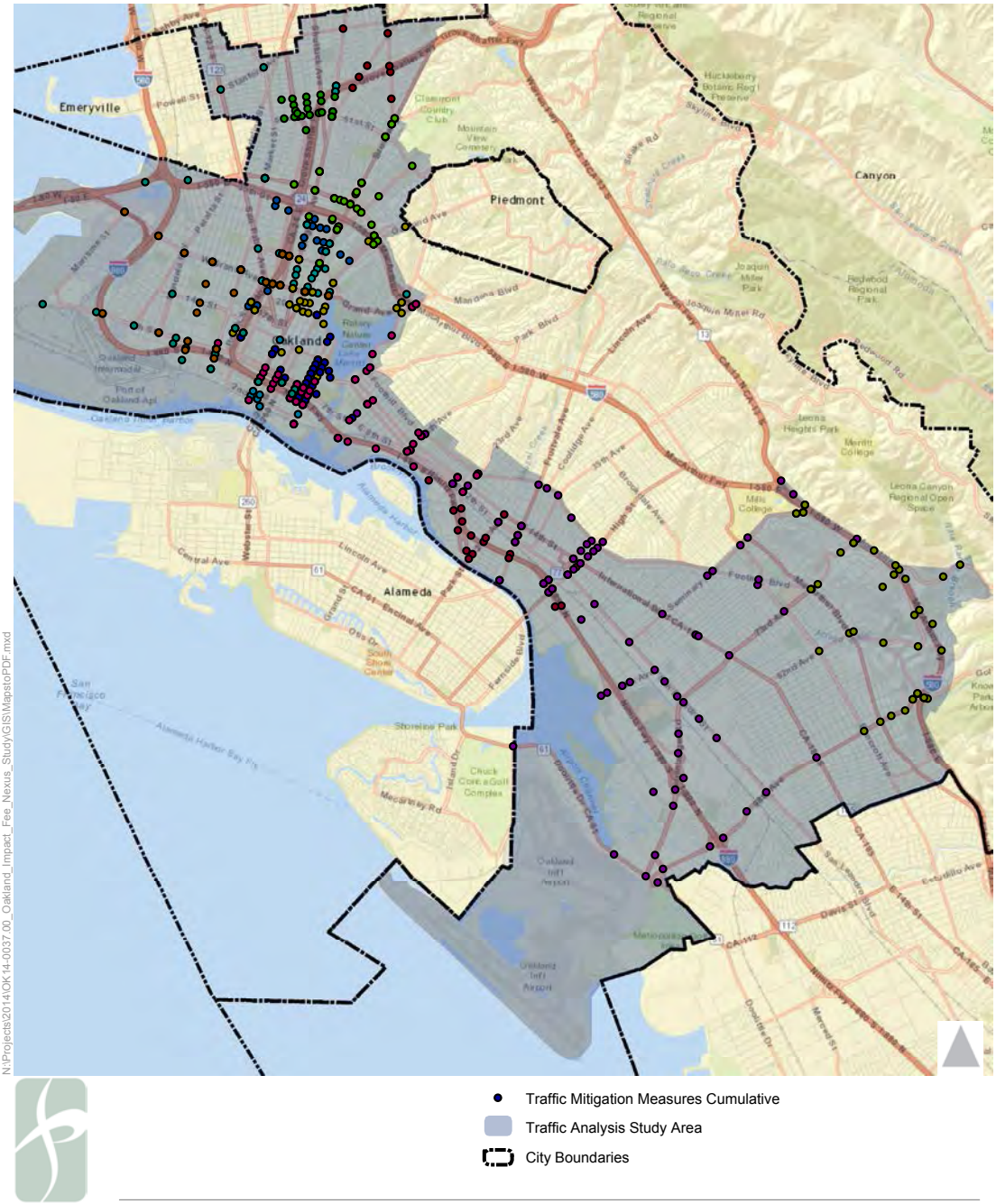
Emeryville
Piedmont
Oakland
Alameda
Canyon
N:\Projects\2014\OK14-0037.00_Oakland_Impact_Fee_Nexus_Study\GIS\MapstoPDF.mxd
Traffic Mitigation Measures Cumulative
Traffic Analysis Study Area
City Boundaries

Table B-1: 2015-2040 Growth Allocation

Land Use	Cumulative Transportation Analysis Study Area		
	Inside Area	Outside Area	Total
Residential *(housing units)*			
Single Family	2,140	1,160	3,300
Multi-Family	45,080	1,320	46,400
Total Residential	47,220	2,480	49,700
Nonresidential *(1,000 sq. ft.)*			
Retail/Commercial	4,310	90	4,400
Hotel/Motel	1,000	-	1,000
Office	9,600	200	9,800
Institutional	3,530	70	3,600
Industrial	2,800	-	2,800
Warehouse	2,500	-	2,500
Total Nonresidential	23,740	360	24,100

Source: Hausrath Economics Group.

Table B-2: 2015-2040 EHU Allocation

Land Use	Cumulative Transportation Analysis Study Area: Inside Area	Outside Area	Total
***Residential** (EHU)*			
Single Family	2,140	1,160	3,300
Multi-Family	31,556	924	32,480
Total Residential	33,696	2,084	35,780
***Nonresidential** (EHU)*			
Retail/Commercial	3,060	64	3,124
Hotel/Motel	620	-	620
Office	7,872	164	8,036
Institutional	4,165	83	4,248
Industrial	1,484	-	1,484
Warehouse	775	-	775
Total Nonresidential	17,976	311	18,287
Total	**51,672**	**2,395**	**54,067**
Share	*96%*	*4%*	*100%*

Note: "EHU" is equivalent housing unit.

Source: Tables 8 and B-1.

Table B-3: Traffic Mitigation Measure Cost per EHU

Total Cumulative Traffic Mitigation Measure Cost (2015 $)	$51,440,000
2015-2035 Equivalent Housing Units (EHU) Within Cumulative Traffic Impact Analysis Study Area	51,672
Cost per EHU	$996

Source: Tables B-2 and B-5.

Table B-4: Traffic Mitigation Measure Fair Share Cost

Land Use	Cost per EHU	EHU Factor	Fair Share Cost /a/	
Residential				
Single Family	$996	1.00	$996	per housing unit
Multi-Family	996	0.70	697	per housing unit
Nonresidential				
Retail/Commercial	$996	0.71	$0.71	per sq. ft.
Hotel/Motel	996	0.62	0.62	per sq. ft.
Office	996	0.82	0.82	per sq. ft.
Institutional	996	1.18	1.18	per sq. ft.
Industrial	996	0.53	0.53	per sq. ft.
Warehouse	996	0.31	0.31	per sq. ft.

/a/ Represents cost sufficient to fund traffic mitigation measures associated with growth within the Cumulative Traffic Impact Analysis Study Area. Does not include costs of mitigation measures associated solely with individual development projects.

Source: Tables 8 and B-3.

Table B-5: Cumulative Traffic Mitigation Measures

Project ID	Improvement Name	Improvement Description	Source Document(s)	Cost *($2015)*
1	Perry Place/I-580 Eastbound Ramps/Oakland Avenue	Optimize signal timing for the PM peak hour.	Broadway Valdez District Specific Plan DEIR (2013)	$52,000
3	24th Street/Broadway	Signalize the intersection providing actuated operations, with permitted left turns on all movements	Broadway Valdez District Specific Plan DEIR (2013); Broadway-West Grand Mixed Use Project Addendum (2013)	$399,000
4	23rd Street/Broadway	Signalize the intersection providing actuated operations, with permitted left turns on all movements	Broadway Valdez District Specific Plan DEIR (2013)	$399,000
5	23rd Street/Harrison Street	Prepare Traffic Study Report to determine if appropriate mitigation, which may include signalization and coordination with Harrison St/Grand Av signal.	Broadway Valdez District Specific Plan DEIR (2013)	$435,000
6	27th Street/24th Street/Bay Place/Harrison Street	Restrict 24th to RTs only from 27th. Create a pedestrian plaza. Convert 24th west of Valdez to 2-way. Allow RTs from 24th to SB Harrison (requires ROW in SW corner). Modify EB 27th to 1 RT, 1 thru, & 2 LT. Realign crosswalks. Reduce cycle to 120 seconds.	Broadway Valdez District Specific Plan DEIR (2013)	$642,000
7	Broadway/51st Street/Pleasant Valley Avenue	Modify SB to provide 2 LT, 1 thru, and 1 shared thru/RT lane. Modify NB to provide 1 LT, 1 thru, and 1 shared thru/RT lane. Upgrade signal equipment to replace N/S split phasing with protected LTs. Eliminate existing NB and SB slip RTs and pork chops.	Broadway Valdez District Specific Plan DEIR (2013)	$518,000
8	40th Street/Telegraph Avenue	Provide permitted-protected operations on the eastbound and westbound approaches	Broadway Valdez District Specific Plan DEIR (2013); Macarthur Transit Village EIR (2008)	$155,000
9	Telegraph Avenue/MacArthur Boulevard	Provide protected left-turn phase(s) for the northbound and southbound approaches; Optimize signal timing, coordinate signal timing	Broadway Valdez District Specific Plan DEIR (2013); ABSMC Summit Campus Seismic Upgrade and Master Plan DEIR (2009); Macarthur Transit Village EIR (2008)	$161,000
10	Telegraph Avenue/27th Street	Provide protected left-turn phases for the northbound and southbound approaches, optimize signal timing, coordinate signal timing	Broadway Valdez District Specific Plan DEIR (2013); ABSMC Summit Campus Seismic Upgrade and Master Plan DEIR (2009); Kaiser Center Office Project DEIR (2010)	$269,000

Project ID	Improvement Name	Improvement Description	Source Document(s)	Cost *($2015)*
11	27th Street/Broadway	Upgrade traffic signal ops at the intersection to actuated-coordinated operations. Reconfigure WB 27th Street approach to provide a 150-foot LT pocket, 1 thru lane, and 1 shared Thru/R-turn lane. Provide protected LT phase/s for the NB and SB approaches.	Broadway Valdez District Specific Plan DEIR (2013)	$394,000
12	Broadway/West Grand Avenue	Provide permitted-protected left-turn phasing for the northbound and southbound approaches.	Broadway Valdez District Specific Plan DEIR (2013); West Oakland Specific Plan Draft EIR (2014); Lake Merritt Station Area Plan DEIR (2014); Broadway-West Grand Mixed Use Project Addendum (2013)	$337,000
35	Embarcadero/16th Avenue Intersection	Install traffic signal and reconfigure lanes at this location, optimize and coordinate signal timing. Construct other roadway improvements that support not only vehicle travel, but all other modes safely to and through the intersection.	Central Estuary Implementation Guide DSEIR (2012)	$869,000
36	East 9th Street/Fruitvale Avenue	Provide a LT lane on SB E 9th and modify signal to protected LTs. The SB LT lane can be accommodated by: a) convert 1 NB lane on E 9th to SB LT, b) widen E 9th on the west, which requires removing trees, reconfiguring the rail crossing, and new signal.	Central Estuary Implementation Guide DSEIR (2012)	$580,000
37	29th Ave/Ford St	A detailed design to the Park St Triangle improvements (including 29th Av/Ford St), subject to review and approval of the City of Oakland TSD. The study of the Park St Triangle improvements to prepared no later than 2020, implementation required by 2022.	Central Estuary Implementation Guide DSEIR (2012)	$4,814,000
39	High Street: I-880 to Tidewater	The 42nd Ave/High St Access Improvements Project will widen High St to accommodate additional travel and left-turn lanes.	Central Estuary Implementation Guide DSEIR (2012)	$5,898,000
59	Kuhnle Avenue/Mountain Boulevard/I-580 Westbound Off-Ramp	Signalize intersection providing actuated operations with permitted left-turns on E-W approaches and split phasing on N-S approaches. Coordinate signal timing with the adjacent intersection in the same signal coordination group.	Coliseum Area Specific Plan DEIR (2014) and Southeast Oakland Traffic Improvement Fee Study (2006)	$1,114,000
60	Sunnymere Avenue/Kuhnle Avenue/Seminary Avenue/I-580 Eastbound On-Ramp	Restripe EB Seminary Ave approach to provide 1 LT and 1 shared Thru/RT. Signalize intersection with actuated operations with split phasing on all approaches. Coordinate signal timing with the adjacent intersections in the same signal coordination group.	Coliseum Area Specific Plan DEIR (2014)	$732,000
61	Seminary Avenue/Overdale Avenue/I-580 Eastbound/SR 13 Southbound Off Ramp	Signalize intersection providing actuated operations with protected LTs on the WB Seminary Ave approach and split phasing on the N-S Overdale Ave/Off-Ramp approaches. Coordinate signal timing.	Coliseum Area Specific Plan DEIR (2014), and Southeast Oakland Traffic Improvement Fee Study (2006)	$614,000

Project ID	Improvement Name	Improvement Description	Source Document(s)	Cost *($2015)*
62	San Leandro Street/66th Avenue	Restripe EB 66th Ave approach to provide 1 LT Lane, 1 thru lane, and 1 RT lane, and narrow the WB direction to one receiving lane. Restripe WB 66th Ave approach to provide 1 LT Lane and one shared thru/RT lane. Optimize and coordinate signal timings.	Coliseum Area Specific Plan DEIR (2014)	$327,000
65	Coliseum Way/High Street	1) Implement planned 42nd Ave/High St Access Improvements which include addition of 2nd LT lane on EB High St and a LT lane on WB High St. 2) Restripe NB Coliseum Way to a shared left/thru lane and a RT lane. 3) Optimize and coordinate signal timing.	Coliseum Area Specific Plan DEIR (2014)	$123,000
69	Camden Street/North MacArthur Boulevard/Seminary Avenue	Restripe EB Seminary Av to 1 LT and 1 shared thru/RT lane by eliminating 1 WB receiving lane. Restripe WB to 1 LT, 1 thru and 1 RT lane. Restripe NB Camden St to 1 shared lane and 1 bicycle lane. Convert signal to permitted N/S and protected E/W phasing.	Coliseum Area Specific Plan DEIR (2014)	$148,000
70	Foothill Boulevard/35th Avenue	Restripe the EB and WB 35th Ave approaches to provide an exclusive LT lane within existing ROW on each approach. Update signal equipment to provide protected E/W LTs. Optimize and coordinate signal timing.	Coliseum Area Specific Plan DEIR (2014)	$311,000
71	Foothill Boulevard/High Street	Convert traffic signal from pre-timed to actuated operations. Optimize signal timing. Coordinate signal timing changes with adjacent intersections in the same signal coordination group.	Coliseum Area Specific Plan DEIR (2014)	$391,000
72	Foothill Boulevard/Seminary Avenue/Walnut Street	Increase signal cycle length at this intersection and the adjacent and closely spaced signal at Bancroft Ave/Seminary Ave to 90 seconds during the PM peak hour. Optimize signal timing. Coordinate signal timing changes	Coliseum Area Specific Plan DEIR (2014)	$141,000
73	San Leandro Street/Hegenberger Road Off-Ramp/75th Avenue	Implement the following measures at the San Leandro St/Hegenberger Rd Off-Ramp/75th Ave intersection: a) Convert signal operations for LT on SB San Leandro St from permitted to protected b) Optimize signal timing c) Coordinate signal timing changes	Coliseum Area Specific Plan DEIR (2014)	$165,000
77	Oakport Street/I-880 SB Ramps/High Street	Convert the SB I-880 SB Off-Ramp approach to provide one left-turn lane, two through lanes, and one right-turn lane. Optimize signal timing. Coordinate signal timing changes with adjacent intersections in the same signal coordination group.	Coliseum Area Specific Plan DEIR (2014)	$757,000
78	Bancroft Avenue/73rd Avenue	Provide 2nd LT lane on NB Bancroft. Replace ex 6-ft gutters, prohibit parking on NB and SB Bancroft. Reconfigure EB 73rd Ave to 1 LT,2 Thru, 1 bicycle, and 1 RT lanes. Reconfigure WB 73rd to 1 LT, 1 thru, 1 thru/RT, and 1 bicycle lane. Optimize timings.	Coliseum Area Specific Plan DEIR (2014)	$441,000
79	Oakport Street/Zhone Way (66th Avenue)	Implement the following measures at the Oakport St/Zhone Way intersection: a) Provide a RT lane on the NB Oakport St approach. b) Optimize signal timing c) Coordinate signal timing	Coliseum Area Specific Plan DEIR (2014)	$461,000

Project ID	Improvement Name	Improvement Description	Source Document(s)	Cost *($2015)*
80	Hegenberger Road/I-880 Southbound Off-ramp	Restripe the SB I-880 Off-Ramp approach from 2 exclusive RT lanes and 2 exclusive LT lanes to 2 exclusive RT lanes, one shared L/RT, and one exclusive LT lane. Optimize signal timing. Coordinate signal timing	Coliseum Area Specific Plan DEIR (2014)	$114,000
82	Hegenberger Road/Hegenberger Court/Edgewater Drive	Add a RT lane on the SB Edgewater Dr approach. Restripe the NB Hegenberger Ct approach to provide one LT lane, and one shared thru/RT lane. Convert N/S approaches from split phasing to protected. Optimize and coordinate signal timing	Coliseum Area Specific Plan DEIR (2014)	$568,000
83	Airport Access Road/Pardee Drive/Hegenberger Road	Convert left-turn operations on the north/south approaches from permitted phasing to protected phasing. Optimize signal timing. Coordinate signal timing changes with adjacent intersections in the same signal coordination group.	Coliseum Area Specific Plan DEIR (2014)	$173,000
126	Adeline Street/18th Street	Upgrade signal to actuated signal control.	West Oakland Specific Plan Draft EIR (2014)	$132,000
127	Adeline Street/5th Street	Modify the traffic signal to remove split phasing and provide protected-permitted LT phasing for the NB and SB LT movements	West Oakland Specific Plan Draft EIR (2014)	$328,000
131	Castro Street/17th Street	Optimize signal timing, coordinate signal timing, modernize signal	1800 San Pablo SEIR (2012); ABSMC Summit Campus Seismic Upgrade and Master Plan DEIR (2009)	$50,000
133	Castro Street/18th Street	Optimize signal timing	1800 San Pablo SEIR (2012)	$50,000
134	Brush Street/17th Street	Optimize signal timing	1800 San Pablo SEIR (2012)	$50,000
135	Brush Street/18th Street	Optimize signal timing	1800 San Pablo SEIR (2012)	$50,000
141	27th Street/Northgate Avenue/I-980 On-Ramps	Optimize signal timing, coordinate signal timing	ABSMC Summit Campus Seismic Upgrade and Master Plan DEIR (2009)	$50,000
142	Telegraph Avenue/Grand Avenue	Add protected LT lanes, optimize signal timing, coordinate signal timing	ABSMC Summit Campus Seismic Upgrade and Master Plan DEIR (2009)	$375,000
152	MacArthur Boulevard/Market Street	Stripe a LT lane on NB Market Street at MacArthur Blvd. Change signal cycle length.	ABSMC Summit Campus Seismic Upgrade and Master Plan DEIR (2009); 2012 Oakland Army Base Project IS/Addendum; Macarthur Transit Village EIR (2008)	$456,000
174	West Grand Avenue/I-880 Frontage Road	Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum	$50,000
175	7th Street/I-880 NB Off-Ramp	Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum	$50,000

Project ID	Improvement Name	Improvement Description	Source Document(s)	Cost *($2015)*
176	West Grand Avenue/Maritime Street	Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum	$50,000
177	7th Street/Union Street	Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum	$50,000
178	West Grand Avenue/Northgate Avenue	Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum	$50,000
179	5th Street/Union Street/I-880 North Ramps	Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum	$50,000
182	West Grand Avenue/Adeline Street	Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum	$50,000
183	West Grand Avenue/Market Street	Provide split phasing for NB and SB approaches, Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum	$245,000
184	West Grand Avenue/San Pablo Avenue	Remove seven parking spaces on south side of Grand Ave, add EB Thru lane between San Pablo Ave and MLK Jr. Way, convert EB RT lane to a Thru-RT Lane , Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum; Emerald Views DEIR (2011)	$230,000
185	Harrison Street/Grand Avenue	Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum; Kaiser Center Office Project DEIR (2010); Oak to Ninth Avenue Project DEIR (2005)	$50,000
186	7th Street/Harrison Street	Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum	$50,000
190	Powell Street/Stanford Avenue/San Pablo Avenue	Optimize signal timing, coordinate signal timing with adjacent intersections	2012 Oakland Army Base Project IS/Addendum; BMSP Redevelopment DSEIR (2011)	$50,000
193	55th Street/Market Street	Increase signal cycle length to 65 seconds during PM Peak Hour; Optimize signal timing; coordinate signal timing	BMSP Redevelopment DSEIR (2011)	$50,000
194	55th Street/MLK Jr. Way	Optimize signal timing, coordinate signal timing	BMSP Redevelopment DSEIR (2011)	$50,000
195	36th Street/San Pablo Avenue	Optimize signal timing, coordinate signal timing	BMSP Redevelopment DSEIR (2011)	$50,000

Project ID	Improvement Name	Improvement Description	Source Document(s)	Cost *($2015)*
196	Lowell between 62nd Street and Adeline Street	Provide continuous sidewalks at least 6 feet wide and a 2-4 foot utility zone, provide directional curb ramps	BMSP Redevelopment DSEIR (2011)	$6,362,000
209	Piedmont Avenue/Pleasant Valley Avenue	Modify signal control equipment to provide lagging protected phasing for NB traffic	Safeway Redevelopment Project Broadway at Pleasant Valley Avenue DEIR (2013)	$148,000
249	Harrison Street/Lakeside Drive	Optimize the traffic signal for PM peak hour in tune with the relative traffic volumes on approaches; Coordinate signal timing	Emerald Views DEIR (2011)	$50,000
254	East 7th Street/Kennedy Street	Optimize the traffic signal at East 7th/Kennedy Street	Gateway Community Development Project DEIR (2007)	$50,000
255	East 12th Street/29th Avenue	Widen and reconfigure the northbound approach to the East 12th Street/29th Avenue intersection to include a LT lane, thru lane, and RT lane. Adjust signal phasing.	Gateway Community Development Project DEIR (2007)	$411,000
265	Oakland Avenue/MacArthur Boulevard/Santa Clara Avenue/I-580 Westbound Off-Ramp	Restripe the NE Oakland Ave approach from the current configuration to 1 LT, 1 Left/Thru lane, 1 Thru lane. Optimize traffic signal. Coordinate signal timing.	Kaiser Center Office Project DEIR (2010)	$157,000
267	Lakeshore Avenue/MacArthur Boulevard/I-580 Eastbound On-Ramp	Optimize traffic signal. Coordinate signal timing.	Kaiser Center Office Project DEIR (2010)	$50,000
269	Harrison Street/Grand Avenue	Implement MM Trans-3c (optimize signal timing, coordinate signal timing) and prohibit SB LT's during the AM peak period	Kaiser Center Office Project DEIR (2010)	$50,000
270	Harrison Street/21st Street	Prohibit EB RT from 21st Street to Harrison Street during the PM Peak Period. Optimize Signal for PM Peak Period. Coordinate signal timing changes.	Kaiser Center Office Project DEIR (2010)	$50,000
271	Harrison Street/MacArthur Boulevard/Santa Clara Avenue	Optimize the traffic signal. coordinate the signal timing changes	Kaiser Center Office Project DEIR (2010)	$50,000
277	Telegraph Avenue/51st Street	Change signal cycle length. Optimize signal timing.	Macarthur Transit Village EIR (2008); Safeway Redevelopment Project Broadway at Pleasant Valley Avenue DEIR (2013)	$50,000
278	West Street/40th Street	Optimize signal timing. Coordinate signal timing.	Macarthur Transit Village EIR (2008)	$50,000

Project ID	Improvement Name	Improvement Description	Source Document(s)	Cost *($2015)*
291	I-580 Westbound Off-Ramp/Mountain Boulevard/Shone Avenue	Implement Trans-1c (install all-way stop controls) and restripe EB I-580 WB Off-Ramp to provide a left-turn lane and shared left/right-turn lane, and restripe the northbound receiving lanes to provide two lanes	Oak Knoll DSEIR (2007)	$19,000
304	Embarcadero/I-880 Northbound Off-Ramp/6th Avenue	Install traffic signal.	Oak to Ninth Avenue Project DEIR (2005)	$595,000
306	Embarcadero/Broadway	Install traffic signal.	Oak to Ninth Avenue Project DEIR (2005)	$856,000
309	Lakeshore Avenue/Foothill Boulevard	Optimize signal timing.	Oak to Ninth Avenue Project DEIR (2005)	$50,000
311	Embarcadero/5th Avenue	Widen Embarcadero to provide two travel lanes in each direction along project frontage. Reconfigure intersection.	Oak to Ninth Avenue Project DEIR (2005)	$9,918,000
312	Embarcadero/I-880 Southbound On-Ramp/10th Avenue	Signalize intersection. Optimize signal timing. Coordinate signal timing.	Oak to Ninth Avenue Project DEIR (2005)	$597,000
313	5th Avenue/7th Street/8th Street	Optimize signal timing. Restripe the WB and EB 5th Ave approaches within the current paved to remove on-street parking and provide separate left-turn, through, and through/right-turn lanes.	Oak to Ninth Avenue Project DEIR (2005)	$308,000
314	14th Avenue/7th Street/12th Street	Optimize signal timing.	Oak to Ninth Avenue Project DEIR (2005)	$50,000
315	Foothill Boulevard/14th Avenue WB	Optimize signal timing.	Oak to Ninth Avenue Project DEIR (2005)	$50,000
316	Foothill Boulevard/14th Avenue EB	Optimize signal timing.	Oak to Ninth Avenue Project DEIR (2005)	$50,000
317	16th Street/23rd Avenue	Optimize signal timing.	Oak to Ninth Avenue Project DEIR (2005)	$50,000
326	Broadway/Hawthorne/Brook Street	Optimize traffic signal.	Oakland Kaiser Medical Center Master Plan DEIR (2006)	$50,000
345	East 12th Street/35th Avenue	Restripe NB 35th Ave to provide one shared LT/thru lane and one shared RT/thru lane, which requires parking removal. Modify signal timings.	Fruitvale Transit Village Phase 2 DEIR (2010)	$213,000
346	San Leandro Street/35th Avenue	eliminate the protected left-turn signal phase for westbound San Leandro Street, and optimize the signal split. Restripe SB 35th Ave to provide one shared LT/thru and one exclusive RT lane.	Fruitvale Transit Village Phase 2 DEIR (2010)	$148,000

Project ID	Improvement Name	Improvement Description	Source Document(s)	Cost *($2015)*
347	San Leandro Street/High Street	Modify signal timings.	Fruitvale Transit Village Phase 2 DEIR (2010)	$50,000
350	East 12th Street/Fruitvale Avenue	Provide protected-permissive left-turn phasing for EB and WB East 12th Street	Fruitvale Transit Village Phase 2 DEIR (2010)	$198,000
352	East 8th Street/Fruitvale Avenue	Modify signal timings.	Fruitvale Transit Village Phase 2 DEIR (2010)	$50,000
353	East 12th Street/37th Avenue	Signalize intersection.	Fruitvale Transit Village Phase 2 DEIR (2010)	$597,000
354	San Leandro Street/37th Avenue	Restripe SB 37th Ave to one exclusive LT lane and one shared RT/through lane. Restripe WB San Leandro St to one shared LT/thru lane, one thru lane and one RT lane, which would require removal of two parking spaces on the north side of San Leandro St.	Fruitvale Transit Village Phase 2 DEIR (2010)	$97,000
360	Embarcadero/Oak Street	Install traffic signals at the intersection. The signals shall have fixed-time controls with permitted left-turn phasing.	Jack London Square Redevelopment Project Addendum (2014), Oak to Ninth Avenue Project DEIR (2005)	$350,000
361	Embarcadero/5th Avenue	Install traffic signals at the intersection. The signals shall have fixed-time controls with permitted left-turn phasing. Widen Embarcadero from one to two travel lanes in each direction.	Oak to Ninth Avenue Project DEIR (2005); Jack London Square Redevelopment Project Addendum (2014); Central City East Redevelopment Plan DEIR (2003)	$245,000
365	Mountain Boulevard/Keller Avenue	Signalize intersection and coordinate with adjacent intersection. Restripe EB Keller Ave to a shared left/thru and shared thru/right, and restripe west leg of Keller Ave from two lanes to one lane.	Southeast Oakland Traffic Improvement Fee Study (2006)	$1,211,000
367	I-580 Eastbound Off-Ramp/Fontaine Street/Keller Avenue	Signalize intersection and coordinate with adjacent Mountain Blvd/Keller Ave intersection.	Southeast Oakland Traffic Improvement Fee Study (2006)	$605,000
370	Study of Edwards Ave and Seminary Ave operational improvements	A study of long-term traffic improvements along the Edwards Ave, 82nd Ave segment and Seminary Ave routes, particularly the Foothill-82nd and the MacArthur-Seminary segments.	Southeast Oakland Traffic Improvement Fee Study (2006)	$515,000
371	Lake Merritt Boulevard/11th Street	Optimize signal timings and coordinate timings with adjacent intersections.	Lake Merritt Station Area Plan DEIR (2014)	$50,000
373	Jackson Street/7th Street	Optimize signal timings and coordinate timings with adjacent intersections.	Lake Merritt Station Area Plan DEIR (2014)	$50,000
374	Jackson Street/6th Street	Optimize signal timings and coordinate timings with adjacent intersections.	Lake Merritt Station Area Plan DEIR (2014)	$50,000
375	Oak Street/6th Street	Optimize signal timings and create an interconnected corridor along Oak St from 5th to 14th Streets.	Lake Merritt Station Area Plan DEIR (2014)	$473,000

Project ID	Improvement Name	Improvement Description	Source Document(s)	Cost *($2015)*
376	5th Street/Oak Street/I-880 Southbound On-Ramp	Optimize signal timings and create an interconnected corridor along Oak St from 5th to 14th Streets.	Lake Merritt Station Area Plan DEIR (2014)	$132,000
378	Madison Street/14th Street	Optimize signal timings and create an interconnected corridor along Madison St from 5th to 14th Streets.	Lake Merritt Station Area Plan DEIR (2014)	$132,000
379	Madison Street/11th Street	Optimize signal timings and create an interconnected corridor along Madison St from 5th to 14th Streets.	Lake Merritt Station Area Plan DEIR (2014)	$132,000
380	Madison Street/10th Street	Optimize signal timings and create an interconnected corridor along Madison St from 5th to 14th Streets.	Lake Merritt Station Area Plan DEIR (2014)	$132,000
381	Oak Street/10th Street	Optimize signal timings and create an interconnected corridor along Oak St from 5th to 14th Streets.	Lake Merritt Station Area Plan DEIR (2014)	$132,000
382	Jackson Street/8th Street	Optimize signal timings and coordinate timings with adjacent intersections.	Lake Merritt Station Area Plan DEIR (2014)	$375,000
383	Oak Street/8th Street	Optimize signal timings and create an interconnected corridor along Oak St from 5th to 14th Streets.	Lake Merritt Station Area Plan DEIR (2014)	$132,000
384	Oak Street/7th Street	Optimize signal timings and create an interconnected corridor along Oak St from 5th to 14th Streets.	Lake Merritt Station Area Plan DEIR (2014)	$132,000
			-	-
			Total Cost	**$51,440,000**

Source: Fehr and Peers, based on the source documents listed in the table, and the methodology described in this appendix.

APPENDIX C:
INVENTORY OF EXISTING PUBLIC FACILITIES

This appendix in the following tables provides a detailed listing of the City's current inventory of public facilities, as defined in Chapter IV:

- **Table C-1**: Existing Fire Facilities Inventory
- **Table C-2**: Existing Fire Department Vehicle Fleet
- **Table C-3**: Existing Police Facilities Inventory
- **Table C-4**: Existing Police Department Vehicle Fleet
- **Table C-5**: Existing Improved Parks
- **Table C-6**: Existing Open Space
- **Table C-7**: Existing Parks and Recreation Facilities Inventory
- **Table C-8**: Existing Library Facilities Inventory
- **Table C-9**: Existing Library Collection

Table C-1: Existing Fire Facilities Inventory

	Building Use	Building Type	Facility Address	Building (sq. ft.)	Parcel (sq. ft.)
Fire Station 01	Fire Station /a/	Essential Service	1603 MLK, Jr Way	16,689	35,465
Fire Station 01	Fire Station /a/	Essential Service	1605 MLK, Jr Way		16,600
Fire Station 02 /b/	Training	Essential Service	29 Jack London Sq.	NA	NA
Fire Station 03	Fire Station	Essential Service	1445 14th St	10,295	37,314
Fire Station 04	Fire Station	Essential Service	1235 East 14th St	6,686	7,000
Fire Station 05	Fire Station	Essential Service	934 34th St	4,264	251
Fire Station 06	Fire Station	Essential Service	7080 Colton Blvd	3,717	13,331
Fire Station 07	Fire Station	Essential Service	1006 Amito Dr	3,958	10,439
Fire Station 08	Fire Station	Essential Service	463 51st St	4,293	10,950
Fire Station 10	Fire Station	Essential Service	172 Santa Clara Ave	3,437	12,000
Station 10 Garage	Utility	Utility	172 Santa Clara Ave	255	
Fire Station 12	Fire Station	Essential Service	822 Alice St	3,787	12,500
Fire Station 13	Fire Station	Essential Service	1225 Derby St	4,392	12,954
Fire Station 14 /c/	Fire Station	Essential Service	3459 Champion St	NA	NA
Station 14 Storage /c/	Utility	Utility	3459 Champion St	NA	NA
Fire Station 15	Fire Station	Essential Service	455 27th St / 404 26th St	7,670	18,472
Fire Station 16	Fire Station	Essential Service	3600 13th Ave	3,951	13,723
Fire Station 17	Fire Station	Essential Service	3344 High St	4,639	15,000
Fire Station 18	Utility	Utility	1700 50th Ave	174	7,097
Fire Station 19	Fire Station	Essential Service	5776 Miles Ave	3,755	14,650
Fire Station 20	Fire Station	Essential Service	1401 98th Ave	11,190	32,574
Fire Station 21	Fire Station	Essential Service	13150 Skyline Blvd	4,184	22,834
Station 21 Pump House	Utility	Utility	13150 Skyline Blvd	32	
Fire Station 22 /b/	Fire Station	Essential Service	1 Airport Dr	NA	NA
Fire Station 23	Fire Station	Essential Service	7100 Foothill Blvd	3,035	8,413
Fire Station 25	Fire Station	Essential Service	2795 Butters Dr	3,305	291,852
Station 25 Exercise	Utility	Utility	2795 Butters Dr	252	12,779
Fire Station 26	Fire Station	Essential Service	2611 98th Ave	6,707	5,630
Fire Station 27	Fire Station	Essential Service	8501 Pardee Dr	4,576	24,089
Fire Station 28	Fire Station	Essential Service	4615 Grass Valley Rd	4,130	19,540
Fire Station 29	Fire Station	Essential Service	1016 66th Ave	3,863	10,950
Station 29 Garage	Utility	Utility	1016 66th Ave	702	
Urban Search & Rescue	Fire Station	Essential Service	5050 Coliseum Way	2,200	?
OFD Training Center Trailer (3 buildings)	Office	Utility	250 Victory Ct	2,959	101,059
OFD Training Center Drill Tower	Utility	Utility	250 Victory Ct	2,140	

	Building Use	Building Type	Facility Address	Building (sq. ft.)	Parcel (sq. ft.)
OFD Training Center-Main Bldg.	Office	Civic	250 Victory Ct	5,359	
Fire Services	Office	Civic	7101 Edgewater Dr	5,838	NA /d/
Fire Prevention Bureau	Office	Civic	Suite ?, 250 Frank Ogawa Pl	6,962	NA /d/
Fire Administration	Fire Station	Utility	Suite 3354, 150 Frank Ogawa Pl	2,578	NA /d/
			Total	**159,656**	**767,466**

/a/ Includes emergency operations center.

/b/ Provides services to and funded by Port of Oakland.

/c/ Facility not in use.

/d/ Building used by multiple city departments so land area not included for purposes of the nexus analysis.

Sources: City of Oakland.

Table C-2: Existing Fire Department Vehicle Fleet

Make	Model	Model Year	Description	Replacement Cost
AMERICAN LAFRANCE	EAGLE	2002	AERIAL LADDER 100 FT	$1,100,000
AMERICAN LAFRANCE	EAGLE	2002	AERIAL LADDER 100 FT	1,100,000
AMERICAN LAFRANCE	EAGLE	2004	LADDER TRUCK	1,100,000
AMERICAN LAFRANCE	EAGLE	2004	LADDER TRUCK	1,100,000
CHEVROLET	3500	1990	TANK WAGON	250,000
CHEVROLET	CAPRICE	1987	SEDAN 4D MARKED FIRE COPA	NA
CHEVROLET	TAHOE LT 4X4	2012	CHEVROLET TAHOE 4X4 (SSV)FIRE	110,000
CHEVROLET	TAHOE LT 4X4	2012	CHEVROLET TAHOE 4X4 (SSV)FIRE	110,000
FORD	2001	2001	2001 FIRE SHOP STEPVAN	200,000
FORD	CF-8000	1994	HOSE TENDER HOSE	250,000
FORD	CF-8001	1994	HOSE TENDER 4X2	250,000
FORD	CF-8002	1994	HOSE TENDER 4X2	250,000
FORD	CF-8003	1994	HOSE TENDER 4X2	250,000
FORD	CLUB WAGON	1994	VAN 8 PASSENGER 1T FIRE	70,000
FORD	CLUB WAGON	1994	VAN 8 PASSENGER 1T FIRE	70,000
FORD	CROWN VICTORIA	2003	FIRE CHIEF - UNMARKED	70,000
FORD	CROWN VICTORIA	2002	UNMARKED FIRE	35,000
FORD	CROWN VICTORIA	2002	UNMARKED FIRE	35,000
FORD	E-150	2001	VAN CARGO FIRE	50,000
FORD	E-350	2008	FIRE BOTTLE VAN	45,000
FORD	E-350	2001	VAN 12 PASSENGER UNL	70,000
FORD	ESCAPE	2008	2008 FORD ESCAPE HYBRID	45,000
FORD	EXPEDITION	2001	WAGON MARKED FIRE	110,000
FORD	EXPEDITION	2001	WAGON UNMARKED FIRE	110,000
FORD	EXPEDITION	2003	WAGON UNMARKED FIRE	110,000
FORD	EXPEDITION	2009	WAGON UNMARKED FIRE	110,000
FORD	EXPLORER	2001	4X2 FIRE NURSE	45,000
FORD	EXPLORER	2010	FIRE STAFF VEHICLE	70,000
FORD	EXPLORER	2010	FIRE STAFF VEHICLE	70,000
FORD	EXPLORER	2010	FIRE STAFF VEHICLE	70,000
FORD	EXPLORER	2010	FIRE STAFF VEHICLE	70,000
FORD	F-150	2002	PICKUP	70,000
FORD	F-150	1992	PICKUP 4X4 1/2T 4 WHEEL DRIVE	70,000
FORD	F-250	2003	PICKUP	70,000
FORD	F-350	2008	SUPER DUTY 4X4 CREW CAB	70,000
FORD	F-350	2010	SUPER DUTY 4X4 CREW CAB	70,000
FORD	F-350	2012	4X4 CREWCAB (RED)	70,000
FORD	F-350	1992	PICKUP 4X2 1T W/BODY U/BODY	70,000
FORD	F-350	1993	WAGON 4X4 XL TANK	250,000
FORD	F-450	2003	FLAT BED TRUCK	85,000
FORD	F-550	2013	CREW W/ HAZMAT UTILITY BODY	150,000
FORD	F-550	1999	WAGON 4X6 TANK	250,000
FORD	F-550	1999	WAGON 4X6 TANK	250,000
FORD	F-550	1999	WAGON 4X6 TANK	250,000
FORD	F-550	1999	WAGON 4X6 TANK	250,000
FORD	F-550	1999	WAGON 4X6 TANK	250,000
FORD	FOCUS	2000	4DSW OF 11/00	35,000
FORD	FOCUS	2000	4DSW OFD 11/00	35,000
FORD	FOCUS	2000	WAGON 4D SE	35,000
FORD	FOCUS	2000	WAGON 4D SE	35,000
FORD	FOCUS	2000	WAGON 4D SE	35,000
FORD	FOCUS	2000	WAGON 4D SE	35,000

Make	Model	Model Year	Description	Replacement Cost
FORD	FOCUS	2000	WAGON 4D SE	35,000
FORD	FOCUS	2000	WAGON 4D SE	35,000
FORD	FOCUS	2000	WAGON 4D SE	35,000
FORD	FOCUS	2000	WAGON 4D SE	35,000
FORD	TAURUS	2003	SEDAN 4DR	35,000
FORD	TAURUS	2003	STAFF CAR	35,000
FORD	TAURUS	2003	STAFF CAR	35,000
FORD	TAURUS	2003	STAFF CAR	35,000
FORD	TAURUS	2002	UNMARKED FIRE	35,000
FREIGHTLINER	FL70	2003	TRUCK COMPRESSED AIR UNIT FIRE	500,000
FREIGHTLINER	MT55	2009	MOBILE FIRE COMMAND CTR	500,000
GENERAL MOTORS	3500	1998	PICKUP 1/2T 4X4 PATROL	70,000
GENERAL MOTORS	3500	1998	PICKUP 1/2T 4X4 PATROL	70,000
INTERNATIONAL	1652SC 4X2	1994	COMMAND POST HAZARDOUS MATERIAL	250,000
INTERNATIONAL	4800 4X4 PUMPER	1994	PUMPER TYPE 3 FIRE	350,000
INTERNATIONAL	4800 4X4 PUMPER	1994	PUMPER TYPE 3 FIRE	350,000
INTERNATIONAL	4800 4X4 PUMPER	1994	PUMPER TYPE 3 FIRE	350,000
ISUZU	NRR	2013	MOUNTED MEDICAL REHAB BODY	200,000
JOHN DEERE	GATOR XUV	2007	UTILITY VEHICLE	35,000
LDV	SS23RR-10CC	2011	LDV (GMC) MMR HI-CUBE VAN	200,000
PIERCE	QUANTUM 1500	1997	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	1997	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	1997	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	1997	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	1997	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	1997	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	1997	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	1998	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	1998	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	1999	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	1999	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2002	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2002	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2002	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2002	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2002	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2002	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2003	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2003	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2003	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2003	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2008	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2008	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2008	QUANTUM CUSTOM FIRE PUMPER	650,000
PIERCE	QUANTUM 1500	2009	QUANTUM PUMPER (FLATLAND RIG)	650,000
PIERCE	QUANTUM 1500	2009	QUANTUM PUMPER (FLATLAND RIG)	650,000
PIERCE	QUANTUM 1500	2014	QUANTUM PUMPER (FLATLAND RIG)	650,000
PIERCE	QUANTUM 1500	2014	QUANTUM PUMPER (FLATLAND RIG)	650,000
PIERCE	QUANTUM 1500	2014	QUANTUM PUMPER (FLATLAND RIG)	650,000
PIERCE	QUANTUM 1500	2009	QUANTUM PUMPER (HILL RIG)	650,000
PIERCE	QUANTUM AERIAL	2012	AERIAL LADDER 100 FT H/DUTY	1,100,000
PIERCE	QUANTUM AERIAL	1998	AERIAL LADDER 100FT	1,100,000
PIERCE	QUANTUM AERIAL	1999	AERIAL LADDER 100FT	1,100,000
PIERCE	QUANTUM AERIAL	1999	AERIAL LADDER 100FT	1,100,000

Make	Model	Model Year	Description	Replacement Cost
PIERCE	QUANTUM AERIAL	1999	AERIAL LADDER 100FT	1,100,000
PIERCE	QUANTUM AERIAL	2014	AERIAL LADDER 10O FT HEAVY DUT	1,100,000
PIERCE	QUANTUM HDR	2011	HEAVY DUTY RESCUE	500,000
SAFE	29T-T SAFE BOAT	2009	MARITIME RESCUE BOAT	500,000
VNP	VP300	1967	PUMPER (SPECIAL EVENT UNIT)	NA
	Average model year	**2002**	**Total Vehicle Fleet Replacement Cost**	**$40,050,000**
			Total Number of Vehicles	**111**
			Average Cost per Vehicle	**$360,811**

Source: City of Oakland.

Table C-3: Existing Police Facilities Inventory

Facility Name	Building Use	Building Type[1]	Facility Address	Building Area (sq. ft.)	Parcel Area (sq. ft.)
Emergency (911) Dispatch Center	911 Dispatch	Civic	7101 Edgewater Dr	7,001	NA /a/
Hall of Justice /b/	Police Administration	Essential Service	455 7th St	237,122	180,000
Eastmont Mall Police Station /c/	Police Station	NA	2701 73rd Ave	NA	NA
			Total	**244,123**	**180,000**

/a/ Building used by multiple city departments and share of land area not included for purposes of the nexus analysis.

/b/ In addition to police administration building (147,905 sq. ft. at 455 7th St.), building area includes former Alameda County offices and courts (63,053 sq. ft. at 600 Washington Street) that have been vacated by the County. The Police Department is renovating and moving into the building as additional space is needed. Building area also includes former jail (26,164 sq. ft. at 611 Broadway) used for storage. Building area excludes parking structure at Jefferson and 7th Streets. Parcel area includes three blocks between Broadway and Jefferson Streets and 6th and 7th Streets.

/c/ Facility leased and not owned by City.

Sources: City of Oakland.

Table C-4: Existing Police Department Vehicle Fleet

Make	Model	Model Year	Description	Quantity	Unit Replacement Cost	Total Cost
CHEVROLET	ASTRO	1990	VAN 7 PASSENGER (ASTRO)	1	$49,000.00	$49,000.00
CHEVROLET	ASTRO	1991	VAN SURVEILLANCE VICE	1	$49,000.00	$49,000.00
CHEVROLET	CAPRICE	1995	UNMARKED POLICE SCHOOL (CAPRICE)	1	$63,000.00	$63,000.00
CHEVROLET	CAVALIER	1991	SEDAN 4D WAGON POLICE	5	$32,000.00	$160,000.00
CHEVROLET	CM10905 ASTRO	1991	POL.PRIS.VAN SDU	1	$49,000.00	$49,000.00
CHEVROLET	GEO PRIZM	1991	SEDAN 4D GSI NUMI DONATED DARE	2	$32,000.00	$64,000.00
CHEVROLET	GEO PRIZM	1991	SEDAN 4D LSI NUMI DONATION DARE	1	$32,000.00	$32,000.00
CHEVROLET	GEO TRACKER	2001	PARKING ENFORCEMENT	5	$32,000.00	$160,000.00
CHEVROLET	LUMINA	1998	SEDAN 4D UNMARKED POLICE	5	$40,000.00	$200,000.00
CHEVROLET	METRO	1905	VAN H/CUB SWAT UPS DONATION	1	$83,606.00	$83,606.00
CHEVROLET	P30	1990	VAN STP SWAT POLICE	1	$104,409.00	$104,409.00
CHEVROLET	TAHOE	2011	2011 CHEVROLET TAHOE POLICE PURSUIT	6	$71,000.00	$426,000.00
CHEVROLET	TAHOE	2013	2013 CHEVROLET TAHOE POLICE PURSUIT	3	$71,000.00	$213,000.00
DODGE	B-353	2009	CARAVAN PARKING ENFORCEMENT	3	$49,524.00	$148,572.00
DODGE	CHARGER	2013	DODGE CHARGER PPV UNMARKED	8	$40,000.00	$320,000.00
DODGE	RAM	2002	2002 DGE RAM1500 CREWCAB (COVERT)	1	$45,317.00	$45,317.00
FORD	CROWN VICTORIA	2009	CHARGEBACK MARKED POLICE ORA	3	$63,000.00	$189,000.00
FORD	CROWN VICTORIA	2009	CHARGEBACK MARKED POLICE PSO SLICK TOP	12	$69,000.00	$828,000.00
FORD	CROWN VICTORIA	2007	CHARGEBACK SLICK MARKED POLICE	18	$63,000.00	$1,134,000.00
FORD	CROWN VICTORIA	2009	CHARGEBACK UNMARKED POLICE ORA	2	$40,000.00	$80,000.00
FORD	CROWN VICTORIA	2000	CROWN VICTORIA	1	$69,000.00	$69,000.00
FORD	CROWN VICTORIA	2000-2010	MARKED POLICE	187	$69,000.00	$12,903,000.00
FORD	CROWN VICTORIA	1997	MARKED POLICE - TRAINER	2	$69,000.00	$138,000.00
FORD	CROWN VICTORIA	2000	MARKED POLICE K9	3	$75,000.00	$225,000.00
FORD	CROWN VICTORIA	2000	MARKED POLICE SCHOOL	2	$69,000.00	$138,000.00
FORD	CROWN VICTORIA	2000	MARKED RANGER	2	$69,000.00	$138,000.00
FORD	CROWN VICTORIA	1997-2003	UNMARKED POLICE	103	$40,000.00	$4,120,000.00
FORD	CROWN VICTORIA	1998-2001	UNMARKED POLICE SCHOOL	4	$63,000.00	$252,000.00
FORD	E-150	2001	VAN CARGO UNL	3	$47,959.00	$143,877.00
FORD	E-250	2001	VAN CARGO (FORD 250)	1	$47,959.00	$47,959.00
FORD	E-350	2000	15 PASSENGER VAN	1	$47,959.00	$47,959.00
FORD	E-350	2013	2013 E350 15 PASS VAN (SWAT CUSTOM)	1	$69,524.00	$69,524.00
FORD	E-350	2003	PRISONER TRANSPORT MARKED	4	$77,270.00	$309,080.00
FORD	E-350	2001	VAN 12 PASSENGER	1	$47,959.00	$47,959.00
FORD	E-350	2001	VAN 15 PASSENGER UNL	1	$47,959.00	$47,959.00
FORD	E-350	2001	VAN 15 PASSENGER VAN UNL	1	$47,959.00	$47,959.00
FORD	E-350	2001	VAN CARGO	1	$47,959.00	$47,959.00
FORD	E-350	2002	VAN HI-CUBE	3	$83,606.00	$250,818.00
FORD	E-450	2002	VAN HI-CUBE 4X2 C/CAB	1	$83,606.00	$83,606.00
FORD	ESCORT	1996	SEDAN 4DR	2	$32,000.00	$64,000.00
FORD	ESCORT	1998	SEDAN 4DR LX	5	$32,000.00	$160,000.00
FORD	ESCORT	1997	SEDAN 4DR LX PARKING ENFORCEMENT	1	$32,000.00	$32,000.00
FORD	ESCORT	1993	WAGON 4DR LX	1	$32,000.00	$32,000.00
FORD	ESCORT	1998	WAGON 4DR LX PARKING ENFORCEMENT	3	$32,000.00	$96,000.00
FORD	EXCURSION	2001	WAGON	2	$69,524.00	$139,048.00
FORD	EXPEDITION	1998	UNMARKED 4X4 POLICE	1	$69,524.00	$69,524.00
FORD	EXPEDITION	2000	USED 4X4 12/00	1	$69,524.00	$69,524.00

Make	Model	Model Year	Description	Quantity	Unit Replacement Cost	Total Cost
FORD	EXPEDITION	2007	UTILITY VEHICLE	2	$69,524.00	$139,048.00
FORD	EXPEDITION	2000	WAGON (EXPEDITION)	2	$69,524.00	$139,048.00
FORD	EXPLORER	2006	2006 FORD EXPLORER XLT COVERT	1	$55,000.00	$55,000.00
FORD	EXPLORER	2002	UNMARKED	4	$55,000.00	$220,000.00
FORD	EXPLORER	2001	UNMARKED 4X4 POLICE AIRPORT	4	$55,000.00	$220,000.00
FORD	F-250	1994	DUMP 4X2 S/CAB PARKING ENFORCEMENT	1	$44,500.00	$44,500.00
FORD	F-250	2003	PICKUP	2	$58,582.00	$117,164.00
FORD	F-250	2001	PICKUP 4X2 W/BODY 3/4T	5	$58,582.00	$292,910.00
FORD	F-350	2001	PICKUP 4X2 1T C/CAB MOUNTED PATROL	1	$58,582.00	$58,582.00
FORD	F-350	2007	PICKUP CREW CAB SHORT BED	1	$58,582.00	$58,582.00
FORD	F-350	1992	TRUCK 1T SURVEY BODY	1	$58,582.00	$58,582.00
FORD	F-450	2012	2012 FORD F450 LARIAT OPD MARKED	1	$71,500.00	$71,500.00
FORD	F-450	2003	FLATBED TRUCK	1	$63,582.00	$63,582.00
FORD	F-59 CHASSIS	2011	FMD F-59 CHASSIS LDV BUILT HNT VAN	1	$292,000.00	$292,000.00
FORD	FOCUS	2002	4DR POLICE	5	$32,000.00	$160,000.00
FORD	FOCUS	2000	WAGON 4D SE	16	$32,000.00	$512,000.00
FORD	FOCUS	2000	WAGON 4D SE PARKING ENFORCEMENT	3	$32,000.00	$96,000.00
FORD	FUSION	2008	SEDAN 4DR PST CARS	2	$40,000.00	$80,000.00
FORD	INTERCEPTOR UT.	2013	INTERCEPTOR UTILITY(PPV) EXPLORER	25	$69,000.00	$1,725,000.00
FORD	LMT	2006	2006 FORD ESCAPE COVERT	1	$32,668.00	$32,668.00
FORD	MSTNG 2D	2000	UM/COVERT	1	$44,826.00	$44,826.00
FORD	SEL	2007	2007 FORD FREESTYLE COVERT	1	$49,000.00	$49,000.00
FORD	THUNDERBIRD	1995	2D COVERT	1	$40,856.00	$40,856.00
FORD	WINDSTAR	1998-2002	VAN 7 PASSENGER	3	$49,000.00	$147,000.00
FORD	WINDSTAR	2001	VAN 7 PASSENGER POLICE	3	$49,000.00	$147,000.00
FORD	WINDSTAR	2001	VAN 7 PASSENGER UNMARKED	1	$49,000.00	$49,000.00
FORD	WINDSTAR	1998	VAN PASSENGER	2	$49,000.00	$98,000.00
FREIGHTLINER	FL70	2006	VAN 6X2 2.5T	1	$265,717.00	$265,717.00
FREIGHTLINER	MT55	2010	CHARGEBACK MOBILE OPD/OFD COMMAND CTR	1	$785,000.00	$785,000.00
GENERAL MOTORS	P3500	1996	VAN HI CUBE POLICE HOSTAGE	1	$180,213.00	$180,213.00
GENERAL MOTORS	SAFARI	1999	VAN POLICE TM11005 TECH	2	$49,000.00	$98,000.00
GENERAL MOTORS	SUBURBAN	1996	UNMARKED COVERT (SUBURBAN)	1	$69,524.00	$69,524.00
HARLEY-DAVIDSON	FLHP	2000-2007	MOTORCYCLE POLICE	28	$31,344.00	$877,632.00
HONDA	CIVIC	2002	SEDAN GX 4DR NGV	8	$32,000.00	$256,000.00
HONDA	CIVIC NGV 4DRGX	2000	SEDAN 4DR (HONDA)	1	$32,000.00	$32,000.00
HONDA	CIVIC NGV 4DRGX	2000	SEDAN 4DR PARKING ENFORCEMENT	8	$32,000.00	$256,000.00
HONDA	CIVIC NGV 4DRGX	2000	SEDAN 4DR PARKING ENFORCEMENT POOL	1	$32,000.00	$32,000.00
HONDA	TRX450FE2	2002	ATV POLICE	1	$18,340.00	$18,340.00
IHC	6X2 26` MBL STA	1998	COMMAND POST WEED AND SEED	1	$321,695.00	$321,695.00
JEEP	LIBERTY	2003-2004	PARKING ENFORCEMENT (JEEP)	6	$32,000.00	$192,000.00
LENCO	4333	2008	CBRNE INCIDENT RESPONSE ARMORED VEHICLE	1	$290,906.00	$290,906.00
MERCURY	XR7 COUPE 2D	1996	UNMARKED COVERT	1	$40,856.00	$40,856.00
MON	SP240 PATIO	1900	BOAT PATIO 32FT DONATION ADD 11	1	$103,545.00	$103,545.00
POLARIS	RANGER XP 800	2013	POLARIS RANGER XP 800 ATV (OPD)	2	$51,642.00	$103,284.00
SUZUKI	DR650SEK7	2007-2009	DUAL PURPOSE OFF-ROAD BIKE POLICE	11	$11,922.00	$131,142.00
TOYOTA	CAMRY	2009	09 CAMRY UNMARKED COVERT	1	$5,856.00	$5,856.00
TOYOTA	CAMRY	2006	2006 TOYOTA CAMRY 4DR (COVERT)	1	$35,856.00	$35,856.00

Make	Model	Model Year	Description	Quantity	Unit Replacement Cost	Total Cost
TOYOTA	COROLLA LE	1991	SEDAN 4DR NUMI DONATED DARE	2	$32,000.00	$64,000.00
TOYOTA	PRIUS	2012	TOYOTA PRIUS C HYBRID FOR PARKING ENFORC	16	$32,000.00	$512,000.00
TOYOTA	SEQUOIA	2002	UNMARKED POLICE (TOYOTA)	1	$69,524.00	$69,524.00
XXX	P31442	2003	VAN POLICE DUI WORKHORSE P31442	1	$83,606.00	$83,606.00
					Total Vehicle Fleet Replacement Cost	**$34,020,000**
					Total Number of Vehicles	**607**
					Average Cost per Vehicle	**$56,046**

Source: City of Oakland.

Table C-5: Existing Improved Parks

Park Type & Name	Address	Parcel (sq. ft.)	Parcel (acres)
Community Parks			
Allendale Park	3711 Suter Street	127,783	2.9
Arroyo Viejo Park	7701 Krause Avenue	818,977	18.8
Brookdale Park	2535 High Street	185,517	4.3
Bushrod Park	569 59th Street	445,034	10.2
DeFremery Park	1651 Adeline Street	410,577	9.4
Dimond Park	3860 Hanly Road	623,937	14.3
Eastshore Park	550 El Embarcadero	192,895	4.4
Estuary Park	Embarcadero	476,837	10.9
Francis Marion Smith	1969 Park Boulevard	68,062	1.6
Franklin Park	1010 East 15th Street	89,595	2.1
Golden Gate Park	1075 62nd Street	159,618	3.7
Jefferson Square	618 Jefferson Street	60,114	1.4
Joaquin Miller Park (improved area)	3300 Joaquin Miller Road	1,306,800	30.0
Josie de la Cruz Park	1637 Fruitvale Avenue	90,593	2.1
Lakeside Park (excludes open water)	400 Grand Avenue	3,267,000	75.0
Lincoln Square Park	261 11th Street	60,359	1.4
Manzanita Park	2701 22nd Avenue	38,370	0.9
Montclair Park	6300 Moraga Avenue	284,973	6.5
Mosswood Park	3612 Webster Street	473,932	10.9
Poplar Park	3130 Peralta Street	87,393	2.0
Rainbow Park	5800 International	105,771	2.4
Redwood Heights Park	3731 Redwood Road	109,919	2.5
San Antonio Park	1701 East 19th Street	462,494	10.6
Sheffield Village Park	247 Marlow Drive	109,014	2.5
Tassafaronga Park	975 85th Avenue	113,414	2.6
Verdese Carter Park	9600 Sunnyside Street	134,333	3.1
William Patterson Park (formerly Brookfield)	525 Jones Avenue	689,614	15.8
Neighborhood Parks			
Athol Plaza Park	1700 Lakeshore Avenue	43,936	1.0
Avenue Terrace Park	4369 Bennett Place	40,377	0.9
Bella Vista Park	1025 East 28th Street	45,247	1.0
Bertha Port Park	1756 Goss Street	9,513	0.2
Cesar Chavez (Foothill Meadows Park)	3705 Foothill Boulevard	72,704	1.7
Clinton Square Park	1230 6th Avenue	86,541	2.0
Columbian Gardens Park (& Annex)	9920 Empire Road	102,751	2.4
Cypress Freeway Memorial Park	14th Street & Mandela	43,143	1.0
Fitzgerald Park	Fitzgerald Street	7,410	0.2
FROG Park	Cavour / Clifton Street	15,002	0.3
Garfield Park	2260 Foothill Boulevard	65,889	1.5
Gateway Gardens Park	Caldecott Lane/Tunnel Road	20,343	0.5
Glen Echo Creek Park	3020 Richmond Blvd.	43,685	1.0
Grove Shafter Park 1	550 34th Street	88,662	2.0
Grove Shafter Park 2	MLK Jr. Way / 36th Street	59,457	1.4
Grove Shafter Park 3	625 37th Street	104,293	2.4
Hardy Park	491 Hardy Street	67,173	1.5

Park Type & Name	Address	Parcel (sq. ft.)	Parcel (acres)
Henry J. Kaiser Park	19th St. btw. San Pablo & Telegraph	23,958	0.6
Lion Creek Park	66th Avenue/Olmsted	217,873	5.0
Marston Campbell Park	17th Street / West Street	130,198	3.0
Martin Luther King Jr Plaza (Dover Park)	5707 Dover Street	49,502	1.1
Maxwell Park	4618 Allendale Avenue	54,526	1.3
Officer Willie Wilkins Park	9700 C Street	87,611	2.0
Peralta Oaks Park	10750 Peralta Oaks	18,753	0.4
Peralta Park	94 E. 10th Street	211,454	4.9
Snow Park	19th Street / Harrison Street	179,761	4.1
South Prescott Park	3rd Street/Chester	182,472	4.2
Splash Pad Park	Grand Avenue / Lakepark	48,052	1.1
Union Point Park (Cryer Site)	1899 Dennison St.	60,857	1.4
Union Point Park	2311 Embarcadero	311,576	7.2
William D. Wood Park	2920 McKillop Street	149,191	3.4
Athletic Fields			
Burckhalter Park	4062 Edwards Avenue	150,062	3.4
Caldecott Park	6900 Broadway	602,519	13.8
Central Reservoir Park	2506 East 29th Street	139,270	3.2
Chabot Park	6850 Chabot Road	156,078	3.6
Concordia Park	3000 62th Avenue	151,156	3.5
Curt Flood Field	Coolidge & School	144,677	3.3
Grass Valley Field	4650 Dunkirk Avenue	42,231	1.0
Greenman Field	1309 66th Avenue	289,478	6.6
Hellman Park	3400 Malcolm Avenue	132,440	3.0
Lazear Field	29th Avenue	57,180	1.3
Lowell Park	1180 14th Street	384,288	8.8
Oakport Field	Oakport Rd., North of 66th Ave.	319,557	7.3
Otis Spunkmeyer Field	Doolittle Drive @ Harbor Bay	292,453	6.7
Pinto Park	5000 Redwood Road	145,880	3.3
Raimondi Park	1650 20th Street	420,965	9.7
Shepherd Canyon Park (fields)	Shepherd Canyon Road	174,240	4.0
Sobrante Park	470 El Paseo Drive	205,470	4.7
Stonehurst Park	10315 East Street	161,477	3.7
Wade Johnson Park	1250 Kirkham Street	104,807	2.4
Special Use Parks			
66th Ave Overlook	66th Avenue & Oakport	231,203	5.3
Adams Park (Veteran's Memorial/senior center)	200 Grand Ave	126,234	2.9
Chinese Garden Park	260 6th Street	58,192	1.3
City Stables	13560 Skyline Blvd	324,176	7.4
Cleveland Cascade	Lakeshore Ave. / Cleveland St.	15,031	0.3
Davie Tennis Stadium	198 Oak Road	217,318	5.0
Dunsmuir Estate Park	61 Covington	2,216,753	50.9
Knowland Park Zoo (improved area)	9777 Golf Links Rd	3,484,800	80.0
Lafayette Square Park	635 11th Street	60,299	1.4
Madison Square Park	810 Jackson Street	60,092	1.4
McCrea Park	4460 Shepherd Street	123,583	2.8
Montclair Railroad Trail	Shepherd Canyon Road	335,411	7.7
Morcom Rose Garden	700 Jean Street	310,909	7.1

Park Type & Name	Address	Parcel (sq. ft.)	Parcel (acres)
Peralta Hacienda Park	2500 34th Avenue	179,139	4.1
Pine Knoll Park	Lakeshore Ave. / Hanover Ave.	57,335	1.3
Linear Park			
Channel Park	21 7th Street	651,004	14.9
Courtland Creek	Courtland Avenue	91,225	2.1
Fruitvale Bridge Park	3205 Alameda Avenue	19,498	0.4
Glen Echo Park	Panama Court / Monte Vista Ave.	43,685	1.0
Mandela Parkway	Mandela Boulevard	565,525	13.0
Oak Glen Park	3390 Richmond Boulevard	125,478	2.9
Ostrander Park	6151 Broadway Terrace	103,543	2.4
Mini - Active Parks			
25th St Mini Park (closed)	25th Street / MLK Jr. Way	NA	NA
88th Ave Mini Park	1805 88th Avenue	14,464	0.3
Cesar Chavez (Foothill Meadows Park Extension)	1800 38th Avenue	11,935	0.3
Chester Street Park	327 Chester Street	Sold	
Dolphin Mini Park	1299 73rd Avenue	5,640	0.1
Durant Mini Park	29th Street / MLK Jr. Way	13,932	0.3
Elmhurst Plaza Tennis	1201 98th Ave.	29,663	0.7
Eula Brinson Mini Park	1712 85th Avenue	10,600	0.2
Holly Mini Park	9826 Holly Street	14,990	0.3
Linden Park	998 42st Street	27,444	0.6
McClymond's Mini Park	2528 Linden Street	8,398	0.2
Morgan Plaza Park	2601 Highland Street	16,822	0.4
Nicol Mini Park	Coolidge & Nicol	9,032	0.2
Oak Park	3239 Kempton Avenue	21,244	0.5
Redondo Park	Redondo St. / Clarke St	26,086	0.6
Tyrone Carney Park	10501 Acalanes Drive	Closed	
Mini - Passive Parks			
14th St Pocket Park	Wood Street & 14th Street	40,763	0.9
Ayala Mini Park	57th Street and Ayala	3,652	0.1
Bay Pointe Park	8th Street & Myrtle	10,653	0.2
Colby Park	431 61st Street	13,850	0.3
Kennedy Tract Park	26th Ave. & E. 9th St.	16,553	0.4
Lakeshore at Longridge Mini Park	3450 Lakeshore Ave.	4,356	0.1
Lazear Mini Park	850 29th Avenue (end of E.9th)	3,762	0.1
Mandana Plaza Park	600 Mandana Avenue	18,229	0.4
Park Blvd Plaza Park	2100 Park Boulevard	27,214	0.6
Picardy Park	5800 Picardy Dr	3,171	0.1
Rockridge Park	6090 Rockridge Boulevard	12,183	0.3
Tomas Melero-Smith Park	1461 65th Avenue	6,000	0.1
Vantage Point Park	1198 13th Avenue	27,313	0.6
Willow Mini Park	14th Street / Willow Street	39,762	0.9
Plazas			
Bishop Begin Plaza	2070 San Pablo Avenue	19,512	0.4
Brooklyn Plaza / Cleveland Cascades	Brooklyn Ave. / Wesley Ave.	49,901	1.1
Frank Ogawa Plaza	Broadway / 14th Street	46,790	1.1
Collins Plaza Park	West Grand / San Pablo Ave.	3,732	0.1
Driver Plaza	5650 Adeline Street	20,566	0.5

Park Type & Name	Address	Parcel (sq. ft.)	Parcel (acres)
Franklin Fountain	418 22nd Street	4,508	0.1
Fruitvale Plaza Park	1412 35th Avenue	3,533	0.1
Helen McGregor Plaza	5210 West Street	9,650	0.2
Latham Square	Broadway / 15th Street	2,629	0.1
Piedmont Plaza	4182 Piedmont Avenue	2,375	0.1
St. Andrews Park	34th Street / San Pablo Avenue	3,659	0.1
Union Plaza	3399 Peralta Street	11,596	0.3
	Total Before Deducting Land Area Associated With Other Facilities	27,725,658	635.9
Parkland Associated With Other Facilities	**Building Area**		
Park Buildings (see Table C.7)	336,135	1,344,540	30.9
Libraries (see Table C.8)	6,497	25,988	0.6
	Total Improved Parkland	**26,355,130**	**604.4**

Note: Excludes open space (see Table C.6). Excludes Middle Harbor Shoreline Park (38 acres) that is built, owned, and operated by the Port of Oakland.

Sources: City of Oakland.

Table C-6: Existing Open Space

Name	Location	Parcel (sq. ft.)	Parcel (acres)
23rd Ave Overpass	23rd Ave	36,637	0.8
Lake Merritt (water)	Harrison/Grand/Lakeshore/12th	6,188,504	142.1
Beaconsfield Canyon	End of Beaconsfield	180,879	4.2
Butters Land Trust	3502 Butters Dr	74,842	1.7
Castle Canyon	Castle Dr	393,478	9.0
Dimond Canyon	3860 Hanly Rd	2,654,055	60.9
Dunsmuir Open Space	Revere Street	6,250,860	143.5
Dunsmuir Addition (2009 purchase)	Malcolm Ave./Kerrigan Dr./Lochard St.	2,805,264	64.4
Garber Park	Alvarado Road / Fish Camp Rd	602,117	13.8
Glen Daniels Park	8501 Fontaine Street	3,372,264	77.4
Grizzly Peak Open Space	Grizzly Peak Blvd.	2,920,972	67.1
Joaquin Miller Park (unimproved)	3300 Joaquin Miller Road	17,429,427	400.1
Knowland Park (unimproved)	Golf Links Rd	17,271,077	396.5
Lake Chabot Golf Course /a/	11450 Golf Links Road	5,908,034	135.6
Leona Heights	4444 Mountain Blvd	2,247,232	51.6
Marjorie Saunders Park	5750 Ascot Drive	87,216	2.0
Panoramic Hill	Derby Street	3,653	0.1
Redwood Creek Open Space	Balmoral	1,011,518	23.2
Richmond Blvd	3020 Richmond Blvd	16,416	0.4
Santa Rita Land Trust	Santa Rita / Ransom	36,145	0.8
Shepherd Canyon Park (unimproved)	Shepherd Canyon Rd	2,094,562	48.1
	Total	**71,585,152**	**1,643.3**

/a/ Nexus analysis includes Lake Chabot and Montclair golf courses as open space only because improvement and expansion is financed with user fees that would increase with new development. Montclair Golf Course is assumed to be included in Dimond Canyon acreage. Metropolitan Golf Course not included because it is the responsibility of the Port of Oakland.

Sources: City of Oakland.

Table C-7: Existing Parks & Recreation Facilities Inventory

Building Use & Facility Name	Building Type	Facility Address	Building (sq. ft.)	Parcel Size (acres) or Park Name /a/
Community Centers				
Chinese (Garden) Community Center	Civic	640 Harrision Street	4,356	Chinese Garden
Columbian Gardens - Community Building	Civic	Koford Road	12,589	Columbia Gardens
Davie Tennis Stadium Clubhouse	Civic	198 Oak Rd, Piedmont	2,864	Davie Tennis
Jack London Aquatic Center	Civic	115 Embarcadero	17,658	Estuary Park
Joaquin Miller Community Center	Civic	3594 Sanborn Drive	7,426	Joaquin Miller
Lakeside Park - Garden Center	Civic	666 Bellevue Ave	16,970	Lakeside
Leona Lodge	Civic	4444 Mountain Blvd	4,031	Leona Heights
Sequoia Lodge	Civic	2666 Mountain Blvd	3,304	8.80
Cultural & Special Use				
Oakland Asian Cultural Center	Civic	388 9th St., Suite 290	/c/	/c/
Dunsmuir House - Carriage House	Civic	2960 Peralta Oaks Ct	3,794	Dunsmuir Estate
Dunsmuir House - Dinkelspiel House	Civic		3,375	
Dunsmuir House - Mansion	Civic		21,600	
Children's Fairyland	Civic	699 Bellevue Ave.	/b/	Lakeside
Junior Center of Art and Science	Civic	558 Bellevue Ave	3,614	
Lake Chalet	Civic	1520 Lakeside Dr.	/b/	
Lakeside Park - Sailboat Classrooms	Civic	Bellevue Ave	4,907	
Lakeside Park - Sailboat House	Civic		7,492	
Rotary Nature Center	Civic	568 Bellevue Ave	2,752	
Golf Course Clubhouse - Lake Chabot	Civic	11450 Golf Links Rd.	/b/	Lake Chabot
Golf Course Clubhouse - Metropolitan	Civic	10505 Doolittle Dr.	/b/	Port of Oakland
Golf Course Clubhouse - Montclair	Civic	2477 Monterey Blvd.	/b/	Dimond
Malonga Casquelourd Center for the Arts	Civic	1428 Alice St	73,338	0.42
Oakland Zoo	Civic	9777 Golf Links Rd.	/b/	Knowland Park
Peralta Hacienda Coolidge House	Civic	2496 Coolidge Ave.	/b/	Peralta Hacienda
Peralta Hacienda Historical House	Civic	2465 34th Ave.	/b/	
Studio One	Civic	365 -371 45th St	17,932	0.94
Recreation Centers				
Allendale Recreation Center	Civic	3711 Suter St	3,206	Allendale
Arroyo Viejo Recreation Center	Civic	7701 Krause Ave	11,569	Arroyo Viejo
Brookdale Recreation Center	Civic	2535 High St	2,418	Brookdale
Bushrod Recreation Center	Civic	560 59th St	8,698	Bushrod
DeFremery Recreation Center	Civic	1651 Adeline St	8,261	DeFremery
Dimond Recreation Center	Civic	3860 Hanly Rd	4,448	Dimond
Discovery Center	Civic	2521 High St	804	Brookdale
East Oakland Multipurpose Senior Center	Civic	9255 Edes Ave	12,461	Brookfield
East Oakland Sports Center	Civic	9161 Edes Ave	25,978	
Francis M. Smith Recreation Center	Civic	1969 Park Blvd	3,608	F.M. Smith
Franklin Recreation Center	Civic	1010 East 15th St	4,046	Franklin
Charles Porter Golden Gate Recreation Center	Civic	1075 62nd St	3,180	Golden Gate
Ira Jenkins Recreation Center	Civic	9175 Edes Ave	14,990	Brookfield
Jefferson Square Recreation Center	Civic	645 7th St	2,177	Jefferson Sq.
Lincoln Square Recreation Center	Civic	250 10th St	6,910	Lincoln Sq.
Manzanita Recreation Center	Civic	2701 22nd Ave	5,946	Manzanita
Montclair Recreation Center	Civic	6300 Moraga Ave	4,499	Montclair

Building Use & Facility Name	Building Type	Facility Address	Building (sq. ft.)	Parcel Size (acres) or Park Name /a/
Mosswood Recreation Center	Civic	3612 Webster St	7,557	Mosswood
Rainbow Recreation Center	Civic	5800 International Blvd	9,368	Rainbow
Rainbow Teen Center	Civic	5818 International Blvd	3,344	
Redwood Annex Recreation Center	Civic	3731 Redwood Rd	1,805	Redwood Heights
Redwood Heights Recreation Center	Civic	3883 Aliso Ave	5,196	
San Antonio Recreation Center	Civic	1701 East 19th St	1,987	San Antonio
Sanborn (Carmen Flores) Recreation Center	Civic	1637 Fruitvale Ave	1,824	Josie de la Cruz
Sheffield Village Recreation Center	Civic	247 Marlow Dr	938	Sheffield Village
Tassafargona Recreation Center	Civic	975 85th Ave	13,574	Tassafargona
Verdese Carter Recreation Center	Civic	9600 Sunnyside St	2,292	Verdese
West Oakland Teen Center	Civic	3233 Market St	NA	[Closed]
Willie Keyes (Poplar) Recreation Center	Civic	3131 Union St	11,179	Poplar
Senior Centers				
North Oakland Senior Center	Civic	5714 MLK, Jr. Way	13,048	6.20
Veteran's Memorial Hall - Senior Center	Civic	200 Grand Ave	30,196	Adams
West Oakland Senior Center	Civic	1724 Adeline St	12,354	0.30
Pools				
Defremery Pool (incl. dressing, mech. rooms)	Civic	1269 18th St.	10,599	Defremery
Fremont Pool (incl. dressing, mech. rooms)	Civic	4559 Foothill Blvd	10,360	0.65
Lion's Pool	Civic	3830 Hanly Rd	3,680	Dimond
Live Oak Pool	Civic	1055 MacArthur Blvd	9,281	[OUSD Property]
Temescal Pool (incl. dressing, mech. rooms)	Civic	365 -371 45th St	10,150	0.94
		Total Square Feet	**489,933**	
		Subtotal Facilities On Separate Parcels (land area shown in table)	140,486	18.25
		Subtotal Facilities in Parks (land area deducted in Table C.5) /a/	336,135	30.87
		Subtotal Facilities in Open Space (land area deducted in Table C.6) /a/	4,031	0.37
		Subtotal Facilities on non-City properties (land excluded)	9,281	NA
		Total Land Area (acres)		49.49
		Total Land Area (sq. ft.)		**2,155,634**

Note: Table does not include ancillary facilities such as maintenance buildings, pools, restrooms, and various other amenities because these improvements are included in the value of improved park land (see Table C.5).

/a/ If park name indicated then land area associated with facility is deducted from either improved park land (Table C.5) or open space (Table C.6). Land area for facilities estimated based on 0.25 floor-area ratio.

/b/ Facilities not maintained by City are not included in the facility standard for the nexus analysis.

/c/ Facility is a business condominium leased to a nonprofit organization.

Sources: City of Oakland.

Table C-8: Existing Library Facilities Inventory

Facility Name	Building Use	Building Type	Facility Address	Building (sq. ft.)	Parcel Size (sq. ft.) or Park Name /a/
81st Avenue Library	Library	Civic	1021 81st Ave	21,000	/b/
African-American Museum & Library	Library	Civic	659 14th St	17,500	15,000
Asian Library	Library	Civic	388 9th St, #190	7,556	/c/
Brookfield Library	Library	Civic	9255 Edes Ave	3,022	Brookfield
Cesar Chavez Library	Library	Civic	3301 E 12th St	/d/	
Dimond Library	Library	Civic	3565 Fruitvale Ave	9,592	19,200
Eastmont Library	Library	Civic	7200 Bancroft Ave, #211	/d/	
Elmhurst Library	Library	Civic	1427 88th Ave	3,155	8,000
Golden Gate Library	Library	Civic	5606 San Pablo Ave	5,501	12,430
Lakeview Library[2]	Library	Civic	550 El Embarcadero	3,475	Lakeside
Main Library	Library	Civic	125 14th St	81,705	60,000
Martin Luther King, Jr. Library	Library	Civic	6833 International Blvd	3,077	13,068
Melrose Library	Library	Civic	4805 Foothill Blvd	10,196	10,850
Montclair Library	Library	Civic	1687 Mountain Blvd	3,206	9,515
Piedmont Avenue Library	Library	Civic	80 Echo Ave	/d/	
Rockridge Library	Library	Civic	5366 College Ave	12,841	24,411
Temescal Library	Library	Civic	5205 Telegraph Ave	5,656	13,362
West Oakland Library	Library	Civic	1801 Adeline St	20,620	30,986
			Subtotal Facilities on Separate Parcels (land area shown in table)	201,605	216,822
			Subtotal Facilities in Parks (land area deducted in Table C.5) /a/	6,497	25,988
			Total	**208,102**	**242,810**

/a/ If park name indicated then parcel is included with improved park land (Table C.5). Land area estimated based on 0.25 floor-area ratio and deducted from Table C.5.

/b/ Parcel owned by Oakland Unified School District.

/c/ Facility is a business condominium.

/d/ Facility leased and therefore not a City capital asset.

Sources: City of Oakland.

Table C-9: Existing Library Collection

Type	Amount	Unit Replacement Cost	Replacement Value
Books	1,065,241	$47	$50,070,000
Documents	352,175	15	5,280,000
Databases	57	NA	NA
E-Books	31,131	60	1,870,000
Audio	58,089	20	1,160,000
Video	80,153	25	2,000,000
Periodicals	2,054	20	40,000
Total	**1,588,900**	**$38**	**$60,420,000**

Sources: City of Oakland; California State Library.

APPENDIX D: INVENTORY OF EXISTING UTILITY INFRASTRUCTURE

On the following pages is a memorandum explaining the assumptions and approach used to develop estimates of existing utility infrastructure replacement costs that are used in Chapter IV.

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REGISTERED PROFESSIONAL ENGINEER
EDWARD W. BOSCACCI JR.
No. C 034369
EXP. 9-30-17
CIVIL
STATE OF CALIFORNIA
3-4-16

MEMORANDUM

Date:	March 4, 2016	**BKF No.:**	20140189-10
Deliver To:	Robert Spencer		
Company:	Hausrath Economics Group		
From:	Ed Boscacci, PE Jake Taylor, EIT		
Subject:	City of Oakland Impact Fee Nexus Storm Drainage, Trash Capture, and Sanitary Sewer System Inventory and Cost Analysis Technical Memorandum (TM No. 1)		

IMPROVEMENT FEES

ASSET CONDITION

The following information is provided to support an improvement fee for the Oakland Nexus Study. The improvement fee is based on a depreciated value of the replacement cost of the storm drainage, sanitary sewer, trash capture, and green infrastructure systems within the City. The objective of this approach is to allow use of fee revenues for rehabilitation of existing assets as one strategy to accommodate additional service demands from new development.

Replacement cost is the current cost of a similar new asset having the nearest equivalent utility. The depreciation of infrastructure uses a straight-line depreciation from 100 percent for facilities constructed after 2014 to 30 percent for facilities constructed prior to 1985 (30 years ago). This is equivalent to a 2.3% depreciation rate per year. A pipeline installed prior to 1985 is assigned a present day worth at 30% of the replacement cost and will not depreciate further. Facilities constructed prior to 1985, have received on-going maintenance that has allowed them to continue to function and maintain a base depreciated value.

Mechanical equipment is evaluated in a similar manner but with a shorter service life. For instance, a trash boom depreciates for 20 years before retaining its baseline worth (30% of the replacement cost) due to ongoing maintenance. Regenerative air street sweepers will depreciate over 7 years and maintain a value of 30% of the replacement cost due to on-going maintenance. Mechanical street sweepers will depreciate over 5 years due to more moving parts, but will also maintain its baseline worth.

STORM DRAINAGE

The following presents the information used to establish a depreciated replacement value for the City of Oakland (City) storm drainage system. System information is developed from an inventory of the City's existing storm drain system that was provided by the City. BKF has used this information to confirm the size, location, and age of pipes installed. The findings of the existing system inventory were used to develop a replacement cost for the subsurface piping of the drainage system. Constructed open channel sections are generally owned and maintained by the Alameda County Flood Control District and are not a part of this study. Port of Oakland facilities that are limited to serving maritime and airport operations are not a part of this study. The study focuses on assets owned and maintained by the City.

1. Inventory and Capital Improvements

The City's storm drainage system includes about 400 miles of pipeline and six pump stations. Much of the system was constructed about 60 to 70 years ago and few upgrades have taken place since then.

Table 1: City Wide Pipe Diameter Distribution

Location	Diameter	Pipe Count	Total Length (Feet)	Total Length (Miles)
Urban	12 inches and less	5,197	384,572	73
	12 to 18 inches	4,067	474,047	90
	18 to 24 inches	1,775	275,347	52
	24 to 36 inches	1,574	314,115	59
	36 to 48 inches	396	66,607	13
	> 48 inches	888	114,964	22
	Totals	13,897	1,629,652	309
Hills	12 inches and less	801	99,703	19
	12 to 18 inches	1,305	189,050	36
	18 to 24 inches	409	68,645	13
	24 to 36 inches	347	70,117	13
	36 to 48 inches	99	22,008	4
	> 48 inches	177	29,685	6
	Totals	3,138	479,207	91
City Totals		17,035	2,108,859	399

2. Unit Costs for System Replacement

Unit construction costs for system replacement were derived from the Storm Drain Master Plan. The unit costs consider open cut trenching, manhole, inlet, Closed Circuit Television (CCTV) review, survey, traffic control, pavement, curb & gutter, striping, landscaping, and contingency costs. The unit costs include a project delivery cost of 35% that includes administrative and engineering work. A summary table of these costs is provided in the following:

Table 2: Storm Drain Installation Cost per Linear Foot (2014)

Diameter (in)	Unit Cost ($/LF)	Diameter (in)	Unit Cost ($/LF)
6	$ 235	78	$ 1,234
12	$ 295	84	$ 1,331
18	$ 374	90	$ 1,447
24	$ 444	96	$ 1,562
30	$ 523	102	$ 1,657
36	$ 608	108	$ 1,752
42	$ 706	114	$ 1,851
48	$ 800	120	$ 1,950
54	$ 918	126	$ 2,054
60	$ 1,010	132	$ 2,158
66	$ 1,074	138	$ 2,267
72	$ 1,137	144	$ 2,376

BKF received GIS data of the City's storm drain piping, which was used to identify pipe diameters and lengths in order to apply the unit costs for system replacement. Depreciation rates were then incorporated to account for asset condition. Note that costs are for replacement with a pipe of similar hydraulic capacity. The system improvement value will change over time based on rates of replacement and the rate of depreciation.

3. Depreciated Replacement Value

The City GIS data includes about 400 miles of storm drain lines that are owned and operated by the City of Oakland. See Appendix A for further discussion regarding the use of the GIS data. Adjusting for errors in length, the entire system piping yields a replacement cost of $953 million and a depreciated value of $286 million.

SANITARY SEWER

The following presents the information used to establish a depreciated replacement value for the City of Oakland (City) sanitary sewer system. System information is developed from an inventory of the City's existing sanitary sewer system that was provided by the City. BKF has used this information to confirm the size, location, and age of pipes installed. The findings of the existing system inventory were used to develop a replacement cost for the subsurface piping of the sanitary sewer system. Major transmission facilities that convey flows from neighboring Cities to the East Bay Municipal Utilities District (EBMUD) regional wastewater treatment plant are owned and maintained by EBMUD and are not a part of this study. Port of Oakland facilities that strictly serve maritime and airport operations are excluded from this study.

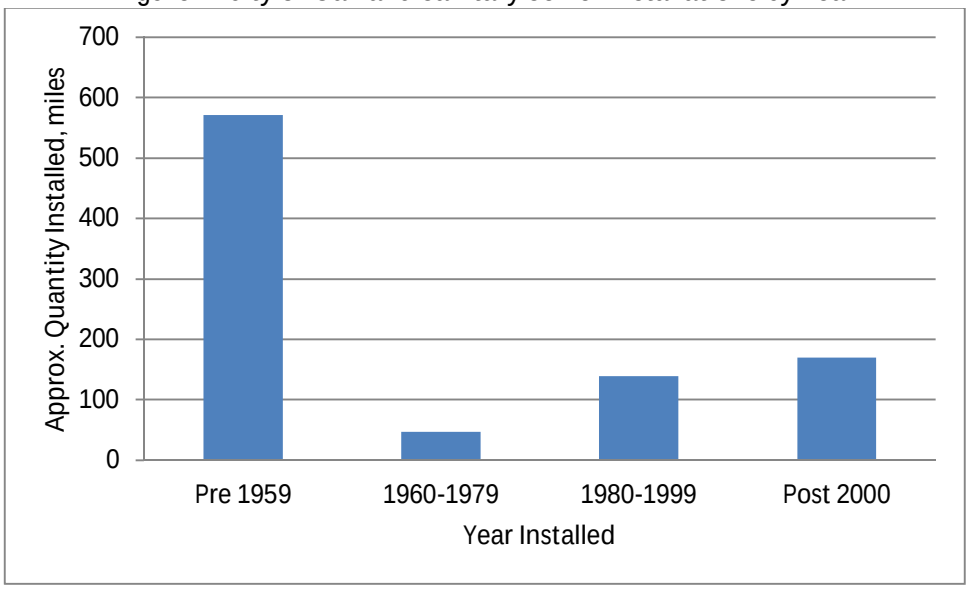
The Cities that are served by EBMUD, including Oakland, received a cease and desist order from the State of California San Francisco Bay Region Regional Water Quality Control Board (RWQCB) regarding the infiltration and inflow to their system in 1986. Subsequently, the City adopted a 25-year program to

reduce infiltration and inflows (I/I). The program was completed in 2014, but in order to remove the cease and desist order, the City agreed to continue rehabilitation under the Consent Decree. Under this agreement, the City will rehabilitate 12 mile of sewer mains each year from specified sub-basins and an additional mile elsewhere in the City.

1. Inventory and Capital Improvements

According to the 2014 Sanitary Sewer Collection System Annual Report, the City has completed rehabilitating 75 sewer basins and has added flow capacity at over 120 locations at a cost of about $300 million. Altogether, the City has rehabilitated approximately 260 of its 928 miles (28%) of sewer pipe since 1985 and replaced 50 miles (5%).

Figure 1: City of Oakland Sanitary Sewer Installations by Year



The following data is shown for the urban versus hill areas of the City to facilitate allocation of costs based on development density (see Appendix C). Of the 928 total miles of sewer pipe installed, 716 miles of pipe are located within the urban area and 211 miles of pipe are located within the hill area, representing 77% and 23% of the total length respectively.

Table 3: Size and Distribution of Sewer Main Pipes

Location	Pipe Diameter (inches)	Length (feet)	Length (miles)
Urban	Under 8 inches	348,047	66
	8 to 12 inches	2,803,281	531
	12 to 15 inches	222,781	42
	15 to 18 inches	91,406	17
	18 to 21 inches	96,419	18
	21 to 24 inches	75,595	14
	24 to 30 inches	58,126	11
	30 to 36 inches	28,685	5
	36 to 42 inches	25,369	5
	42 to 48 inches	7,682	1
	48 to 54 inches	10,672	2
	54 to 60 inches	2,325	0
	60 to 66 inches	9,650	2
	Over 66 inches	2,585	0
	Totals	3,782,622	716
Hills	Under 8 inches	40,159	8
	8 to 12 inches	993,887	188
	12 to 15 inches	36,210	7
	15 to 18 inches	12,752	2
	18 to 21 inches	17,198	3
	21 to 24 inches	11,344	2
	24 to 30 inches	2,832	1
	30 to 36 inches	1,393	0
	36 to 42 inches	-	-
	Over 42 inches	356	0
	Totals	1,116,131	211
City Totals		4,907,490	928

2. Unit Costs

Unit construction costs for sewer lines were not provided in the Sanitary Sewer Master Plan. For this evaluation, the cost for replacement of sewer lines will be similar to that used for the storm drain system. Unit replacement costs derived from the Storm Drain Master Plan are used with corrections made for a lack of inlets and pipe-bursting costs, where applicable. The unit costs also considered deeper installation for sewer lines to meet City requirements. The sewer unit costs consider manhole, CCTV, survey, traffic control, pavement, curb & gutter, striping, and contingency costs. The unit costs also include 35% for project delivery that includes administrative and engineering work. For replacement construction, the unit costs use open cut trenching costs. For sewer lines within the rehabilitation program, a pipe-bursting cost

of $250 per linear foot was applied to lines 10-inches and smaller. A summary table of the replacement costs is provided below:

Table 4: Sanitary Sewer Installation Cost per Linear Foot

Diameter (in)	Construction Unit Cost ($/LF)	Diameter (in)	Construction Unit Cost ($/LF)
6	$ 263	78	$ 1,374
12	$ 357	84	$ 1,478
18	$ 443	90	$ 1,601
24	$ 520	96	$ 1,724
30	$ 609	102	$ 1,826
36	$ 703	108	$ 1,927
42	$ 811	114	$ 2,034
48	$ 914	120	$ 2,140
54	$ 1,041	126	$ 2,251
60	$ 1,143	132	$ 2,362
66	$ 1,207	138	$ 2,478
72	$ 1,270	144	$ 2,594

BKF received GIS data of the City's sewer piping, which was used to identify pipe diameters and lengths in order to apply these unit costs. Depreciation rates were then applied to account for aging facilities.

3. Depreciated Replacement Value

The 928 miles of pipe have a total replacement cost of $1.5 billion. For the 618 miles of sewer pipe installed before 1985, the depreciated value is $312 million. The 310 miles rehabilitated or replaced since 1986 (260 miles and 50 miles respectively) has a depreciated replacement value of $289 million. See Appendix A for further discussion of the GIS data use. Altogether the sewer system has a current worth of $601 million for depreciated replacement value.

TRASH CAPTURE

The following presents the information used to establish a depreciated replacement value for the City of Oakland (City) trash capture system. System information is developed from an inventory of the City's existing trash capture system that was provided by the City. BKF has used this information to confirm the size, location, and age of trash capture facilities installed. The findings of the existing system inventory were used to develop a replacement cost for the trash capture system. Port of Oakland facilities that are limited to serving maritime and airport operations are not a part of this study.

Trash generation refers to the rate at which trash is produced on the surface and potentially available for transportation in the storm drainage system. For the Long-Term Trash Reduction Plan and Progress Assessment Strategy published in 2014, trash generation was estimated based on land use, while also considering population density where applicable. The City adopted the trash generation rates set forth by the BATCD and created a corresponding map of the City. This information was reviewed by City staff

to incorporate individual knowledge regarding the issue. The City also conducted field verification trips. The final figure is shown as Appendix B.

In 1999, Oakland's Lake Merritt was the first waterway in the State to be listed as an impaired waterway for trash. Since then, the weight of trash found in Lake Merritt has been reduced by over 50%. Additionally, 928 acres of the City is served by full trash capture facilities including gross linear solids removal devices (GRSD), hydrodynamic separators (CDS), and connector pipe screens (CPS). The City is served by partial trash capture devices including auto-retractable screens (ARS) and trash booms. BKF has investigated the quantity and type of these trash capture facilities and also conducted asset evaluation of these measures.

1. Inventory and Capital Improvements

The Municipal Regional Permit (November 2015, Order No. R2-2015-0049) (2015 MRP) requires a long-term trash reduction plan to attain a 70% trash load reduction by July 1, 2017 and 80% by July 1, 2019. The State of California has adopted the Inland Surface Waters, Enclosed Bays, and Estuaries of California (ISWEBE Plan). The State is awaiting final approval by the Environmental Protection Agency prior to officially adopting this Plan. In general, the ISWEBE Plan will be consistent with the 2015 MRP. As part of the 2015 MRP and prior permits, the City has installed the following trash capture devices:

Full Trash Capture
- 2 GRSD's
- 10 CDS units
- 11 CPS units

Partial Trash Capture
- 7 trash booms on Lake Merritt
- 2 pump station trash racks
- 8 ARS's

Vehicles
- 13 mechanical street sweepers
- 4 regenerative air street sweepers
- 3 vacuum trucks

2. Unit Costs

Unit costs were determined from City records, BKF construction projects and relevant studies. Caltrans conducted a GRSD pilot study on Linear Radial Devices which includes associated material and installation costs. The Bay Area-wide Trash Capture Demonstration Project (BATCD) was completed in 2014 and offers costs for various trash capture devices. A summary table of unit costs is available below:

Table 5: Trash Capture Installation Cost

Trash Capture Devices	Cost (including installation)
Hydrodynamic Separators	$ 407,500
Linear Radial Devices	$ 149,000
Trash Booms	$ 43,000
Mechanical Street Sweepers	$ 318,000
Regenerative Air Street Sweepers	$ 273,000
Vacuum Trucks	$ 330,000
Auto Retractable Screens	$ 800
Connector Pipe Screens	$ 1,500

Costs involving maintenance were not considered. BKF reviewed information regarding the year of installation to apply depreciation rates.

3. Depreciated Replacement Value

The 23 full trash capture devices, 7 trash booms, 8 ARS, and 20 trash capture vehicles have a replacement cost of $10.1 million. Since the first device was installed in 2002, the depreciation has been very minimal. The present day worth of the trash capture system is approximately $7.75 million. This value does not include any costs associated with maintenance.

GREEN INFRASTRUCTURE

The City plans to install green infrastructure to treat storm water through natural processes and enhance community space. Green infrastructure refers to low impact development, which incorporates swales, flow through planters, permeable pavement, green bulb outs, and etc. into roadway designs. There is not currently sufficient green infrastructure within the City to justify inclusion in this Nexus Fee Study. The City should monitor green infrastructure to evaluate whether inclusion in future updates is warranted.

MITIGATION OF INCREASED FLOWS

APPROACH

The following information is provided to support mitigation measures including additional fees for the Oakland Nexus Study. BKF has investigated the impact of new development on the storm, trash capture, and sanitary sewer systems and proposed its associated requirements to mitigate additional stress. Developers will not be financially responsible for capital improvement projects necessary to accommodate an increase in storm, trash capture, or sanitary sewer demand. Developers will instead be responsible for mitigation to match pre-development and post-development flows. The project team has worked with City staff to research and evaluate priority programs to accomplish this task. For storm water, reduction to pre-development flows requires storm water detention. For trash capture, the City is preparing conditions of approval for development projects to mitigate increased trash generation. For sanitary sewer, an equivalent reduction of infiltration and inflow (I/I) is proposed.

STORM DRAINAGE

Parameters for documenting reductions in storm flows associated with development are detailed in the City's storm drainage design standards (see Appendix E). Specifically, detention basins shall be designed to delay urban runoff from new development so that the post-project discharge rate does not exceed the flow rate associated with the site in a natural condition. The City uses the Modified Rational Method to conduct this analysis. For development projects that disturb 50 acres of soil but less than 640 acres, the developer must reduce the existing 100-year peak discharge to establish a baseline flow. Detention volume shall be calculated per Section 3.6.1 of the City's design guidelines.

Trash Capture

To accommodate increased flows from new development the City is preparing a Standard Condition of Approval for development project that may require, for example, installation of inlet screens/baskets in high/very high trash areas.

SANITARY SEWER

With the proposed mitigation, new development will not increase sanitary sewer system flows. All flow capacity deficiencies will be addressed as part of the Master Plan. Therefore, evaluation of specific impact areas for sewer will not be necessary. The effect of future development on existing system deficiencies is not addressed as a part of this study because these deficiencies will be addressed as a part of the proposed Master Plan improvements.

The City currently has no adopted procedure for documenting reduction in I/I to off-set increased sewer generation. Various methods are available for use. The following summarizes potential methods that can be adopted by the City:

Document Daily Pre-Project Sewer Generation:

Daily Pre-Project Sewer Generation at a site can be documented using various methods including:

Indoor Use:

1. Water Bills reduced by 10 percent
2. Typical usage rates for development type as listed in the Sanitary Sewer Design Standards

Outside Use / Infiltration and Inflow:

1. Site specific flow monitoring
2. I/I per acre (typically taken from the Master Plan and typical for the Sewershed)

The daily Pre-Project sewer generation can be established only for the period within 10 years of the project application date. No credit is provided for uses that occurred prior to the 10-year date.

Document Daily Proposed Sewer Generation:

Base sewer generation from the project on generation rates presented in the Sanitary Sewer Design Standards. Include an allowance of 1,000 gallons per day per acre for I/I.

If the daily proposed sewer generation is greater than the pre-project sewer generation, the developer must offset the difference by either offsite improvements or contribution to a City-wide fee that will be used to mitigate for development projects.

The project team has estimated the extent to which replacement of sewer lines may result in a reduction in infiltration and inflow. From 2006 to 2011, rain fall dependent infiltration and inflow in Oakland was reduced by 6.4 MGD according to EBMUD studies. For each linear foot of pipe rehabilitated or replaced during that time period, approximately 25.6 gallons per day of I/I is mitigated. With 70% pipe-burst and 30% replacement for a 12-inch line, a $282 (2015 dollars) rehabilitation cost per

linear foot yields a mitigation fee of $10.94 per gallons per day for new development. This fee applies to all unmitigated flows in the City of Oakland. Unmitigated flows are flows in excess of the existing flows.

The City's sanitary sewer design standards provide average daily flow rates by specified developments. By attributing appropriate average daily generation rates to existing and proposed conditions, the developer can receive credit for existing flows and properly evaluate mitigation needs.

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APPENDICIES

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APPENDIX A

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Applying City of Oakland GIS Data

STORM DRAINAGE

The City Storm Drain Master Plan states that there are 402 miles of installed pipe. About 3 miles of this total are within the Port of Oakland and are not considered in this study. The City therefore owns and maintains 399 miles of storm drain piping. We concur with the City that the Master Plan data is more accurate for miles of installed pipe while the GIS database is helpful for identifying pipe characteristics. The City GIS provided 418 miles of storm drain pipe owned by the City and Port of Oakland. We believe that the length of 418 miles may be high because of possible double-counting and incorrect lengths being input. Of the 418 miles available, no length of pipe had a corresponding date of installation. However since the City's storm drainage was installed in its entirety before 1985, the year installed is irrelevant for our depreciated replacement value analysis. Because no improvements have been made since the pipes were originally installed, anything that pre-dates 1985 has a depreciated value of 30% of its replacement cost. The replacement cost was applied using the unit costs of the 335 miles that have diameters listed. That cost was then adjusted to the approximate 399 miles of storm drain piping that has been installed in the City of Oakland by using the same percentage of pipe size for the remaining 64 miles as from the known 335 miles.

Table 1: City Wide Pipe Diameter Distribution (Includes Port of Oakland)
City of Oakland Master Plan Report – 2006)

Diameter	Total Length (Feet)	Total Length (Miles)	% of Total
12 inches and less	407,389	77	19%
12 to 18 inches	560,002	106	26%
18 to 24 inches	290,355	55	14%
24 to 36 inches	571,033	108	27%
36 to 48 inches	91,464	17	4%
> 48 inches	204,322	39	10%
Totals	2,124,565	402	100%

The following data is shown for the urban versus hill areas of the City to facilitate allocation of costs based on development density (see Appendix C), and excludes data from the Port of Oakland facilities that are limited to serving maritime and airport operations.

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Table 2: GIS Data - City Wide Pipe Diameter Distribution

GIS Data					*GIS Data Adjusted for Length*				
	Diameter	Pipe Count	Total Length (Feet)	Total Length (Miles)		Diameter	Pipe Count	Total Length (Feet)	Total Length (Miles)
Urban	< 12”	4,075	322,769	61	Urban	< 12”	5,197	384,572	73
	12”-18”	3,185	397,457	75		12”-18”	4,067	474,047	90
	18”-24”	1,392	231,142	44		18”-24”	1,775	275,347	52
	24”-36”	1,234	263,313	50		24”-36”	1,574	314,115	59
	36”-48”	310	55,696	11		36”-48”	396	66,607	13
	> 48”	696	96,059	18		> 48”	888	114,964	22
	Totals	**10,892**	**1,366,436**	**259**		**Totals**	**13,897**	**1,629,652**	**309**
Hills	< 12”	629	83,753	16	Hills	< 12”	801	99,703	19
	12”-18”	1,024	158,806	30		12”-18”	1,305	189,050	36
	18”-24”	321	57,663	11		18”-24”	409	68,645	13
	24”-36”	272	58,900	11		24”-36”	347	70,117	13
	36”-48”	78	18,487	4		36”-48”	99	22,008	4
	> 48”	139	24,937	5		> 48”	177	29,685	6
	Totals	**2,463**	**402,546**	**76**		**Totals**	**3,138**	**479,207**	**91**
City Totals		**13,355**	**1,768,982**	**335**	**City Totals**		**17,035**	**2,108,859**	**399**

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Table 3A: Urban Area Depreciated Replacement Value (1”-44”) – Adjusted GIS Data

Diameter (in)	Length (ft)	Unit Cost ($/LF)	Replacement Cost ($)	Depreciation	Depreciated Replacement Value ($)
1	451	$ 185	$ 83,450	30%	$ 25,035
2	1,676	$ 195	$ 326,845	30%	$ 98,054
3	226	$ 205	$ 46,299	30%	$ 13,890
4	4,646	$ 215	$ 998,790	30%	$ 299,637
5	1,594	$ 225	$ 358,634	30%	$ 107,590
6	29,742	$ 235	$ 6,989,465	30%	$ 2,096,840
7	430	$ 245	$ 105,378	30%	$ 31,614
8	38,077	$ 255	$ 9,709,514	30%	$ 2,912,854
9	9	$ 265	$ 2,408	30%	$ 722
10	97,700	$ 275	$ 26,867,624	30%	$ 8,060,287
11	45	$ 285	$ 12,784	30%	$ 3,835
12	209,353	$ 295	$ 61,759,193	30%	$ 18,527,758
13	811	$ 308	$ 249,815	30%	$ 74,945
14	16,043	$ 321	$ 5,149,761	30%	$ 1,544,928
15	188,985	$ 333	$ 62,931,983	30%	$ 18,879,595
16	14,002	$ 347	$ 4,858,857	30%	$ 1,457,657
18	253,018	$ 374	$ 94,628,806	30%	$ 28,388,642
19	368	$ 386	$ 142,121	30%	$ 42,636
20	2,143	$ 398	$ 852,847	30%	$ 255,854
21	113,137	$ 409	$ 46,273,207	30%	$ 13,881,962
22	870	$ 421	$ 366,206	30%	$ 109,862
24	158,474	$ 444	$ 70,362,361	30%	$ 21,108,708
25	730	$ 457	$ 333,384	30%	$ 100,015
26	281	$ 470	$ 132,219	30%	$ 39,666
27	54,140	$ 484	$ 26,203,904	30%	$ 7,861,171
29	175	$ 510	$ 89,135	30%	$ 26,740
30	57,313	$ 523	$ 29,974,682	30%	$ 8,992,404
31	848	$ 537	$ 455,334	30%	$ 136,600
32	390	$ 552	$ 215,301	30%	$ 64,590
33	33,160	$ 566	$ 18,768,788	30%	$ 5,630,636
34	1,215	$ 580	$ 704,532	30%	$ 211,360
36	165,015	$ 608	$ 100,328,839	30%	$ 30,098,652
38	-	$ 641	$ -	30%	$ -
39	14,760	$ 657	$ 9,697,579	30%	$ 2,909,274
40	148	$ 674	$ 99,994	30%	$ 29,998
42	25,152	$ 706	$ 17,757,392	30%	$ 5,327,218
43	-	$ 722	$ -	30%	$ -
44	-	$ 738	$ -	30%	$ -

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Table 3B: Urban Area Depreciated Replacement Value (45”-192”) – Adjusted GIS Data

Diameter (in)	Length (ft)	Unit Cost ($/LF)	Replacement Cost ($)	Depreciation	Depreciated Replacement Value ($)
45	10,885	$ 753	$ 8,196,578	30%	$ 2,458,974
48	14,235	$ 800	$ 11,387,690	30%	$ 3,416,307
49	258	$ 820	$ 211,818	30%	$ 63,545
51	3,380	$ 859	$ 2,903,223	30%	$ 870,967
54	18,246	$ 918	$ 16,749,814	30%	$ 5,024,944
55	282	$ 933	$ 262,878	30%	$ 78,863
57	6,487	$ 964	$ 6,253,002	30%	$ 1,875,901
58	3,916	$ 979	$ 3,833,443	30%	$ 1,150,033
60	20,192	$ 1,010	$ 20,393,603	30%	$ 6,118,081
63	9,226	$ 1,042	$ 9,613,198	30%	$ 2,883,959
65	267	$ 1,063	$ 283,592	30%	$ 85,077
66	15,227	$ 1,074	$ 16,353,346	30%	$ 4,906,004
69	3,181	$ 1,106	$ 3,517,795	30%	$ 1,055,338
72	8,368	$ 1,137	$ 9,514,072	30%	$ 2,854,221
73	60	$ 1,153	$ 68,624	30%	$ 20,587
75	4,123	$ 1,186	$ 4,890,186	30%	$ 1,467,056
78	8,504	$ 1,234	$ 10,493,774	30%	$ 3,148,132
84	8,026	$ 1,331	$ 10,682,248	30%	$ 3,204,674
87	708	$ 1,389	$ 983,153	30%	$ 294,946
92	154	$ 1,485	$ 228,490	30%	$ 68,547
94	-	$ 1,524	$ -	30%	$ -
96	3,934	$ 1,562	$ 6,144,160	30%	$ 1,843,248
108	536	$ 1,752	$ 939,598	30%	$ 281,879
121	29	$ 1,967	$ 57,822	30%	$ 17,347
192	-	$ 3,340	$ -	30%	$ -
City Totals	**1,625,348**		**$ 741,799,538**		**$ 222,539,861**

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Table 4A: Hill Area Depreciated Replacement Value (1”-44”) – Adjusted GIS Data

Diameter (in)	Length (ft)	Unit Cost ($/LF)	Replacement Cost ($)	Depreciation	Depreciated Replacement Value ($)
1	-	$ 185	$ -	30%	$ -
2	747	$ 195	$ 145,593	30%	$ 43,678
3	100	$ 205	$ 20,515	30%	$ 6,154
4	1,186	$ 215	$ 254,949	30%	$ 76,485
5	532	$ 225	$ 119,750	30%	$ 35,925
6	23,869	$ 235	$ 5,609,310	30%	$ 1,682,793
7	-	$ 245	$ -	30%	$ -
8	17,345	$ 255	$ 4,422,984	30%	$ 1,326,895
9	-	$ 265	$ -	30%	$ -
10	17,009	$ 275	$ 4,677,470	30%	$ 1,403,241
11	-	$ 285	$ -	30%	$ -
12	38,930	$ 295	$ 11,484,318	30%	$ 3,445,295
13	149	$ 308	$ 45,762	30%	$ 13,729
14	619	$ 321	$ 198,635	30%	$ 59,590
15	76,238	$ 333	$ 25,387,305	30%	$ 7,616,192
16	688	$ 347	$ 238,658	30%	$ 71,597
18	111,385	$ 374	$ 41,657,829	30%	$ 12,497,349
19	-	$ 386	$ -	30%	$ -
20	1,682	$ 398	$ 669,458	30%	$ 200,837
21	22,082	$ 409	$ 9,031,558	30%	$ 2,709,467
22	-	$ 421	$ -	30%	$ -
24	44,891	$ 444	$ 19,931,453	30%	$ 5,979,436
25	112	$ 457	$ 51,179	30%	$ 15,354
26	30	$ 470	$ 14,159	30%	$ 4,248
27	11,713	$ 484	$ 5,669,283	30%	$ 1,700,785
29	-	$ 510	$ -	30%	$ -
30	26,495	$ 523	$ 13,856,753	30%	$ 4,157,026
31	100	$ 537	$ 53,494	30%	$ 16,048
32	-	$ 552	$ -	30%	$ -
33	5,905	$ 566	$ 3,342,380	30%	$ 1,002,714
34	-	$ 580	$ -	30%	$ -
36	25,772	$ 608	$ 15,669,497	30%	$ 4,700,849
38	83	$ 641	$ 53,046	30%	$ 15,914
39	3,575	$ 657	$ 2,348,645	30%	$ 704,593
40	-	$ 674	$ -	30%	$ -
42	3,972	$ 706	$ 2,804,568	30%	$ 841,370
43	59	$ 722	$ 42,543	30%	$ 12,763
44	54	$ 738	$ 39,640	30%	$ 11,892

Table 4B: Hill Area Depreciated Replacement Value (45”-192”) – Adjusted GIS Data

Diameter (in)	Length (ft)	Unit Cost ($/LF)	Replacement Cost ($)	Depreciation	Depreciated Replacement Value ($)
45	-	$ 753	$ -	30%	$ -
48	14,269	$ 800	$ 11,414,801	30%	$ 3,424,440
49	-	$ 820	$ -	30%	$ -
51	2,751	$ 859	$ 2,362,851	30%	$ 708,855
54	6,864	$ 918	$ 6,300,925	30%	$ 1,890,278
55	-	$ 933	$ -	30%	$ -
57	1,340	$ 964	$ 1,292,192	30%	$ 387,658
58	-	$ 979	$ -	30%	$ -
60	3,686	$ 1,010	$ 3,723,158	30%	$ 1,116,947
63	-	$ 1,042	$ -	30%	$ -
65	-	$ 1,063	$ -	30%	$ -
66	2,663	$ 1,074	$ 2,859,643	30%	$ 857,893
69	296	$ 1,106	$ 327,093	30%	$ 98,128
72	4,210	$ 1,137	$ 4,786,989	30%	$ 1,436,097
73	-	$ 1,153	$ -	30%	$ -
75	-	$ 1,186	$ -	30%	$ -
78	1,001	$ 1,234	$ 1,235,823	30%	$ 370,747
84	5,622	$ 1,331	$ 7,482,831	30%	$ 2,244,849
87	-	$ 1,389	$ -	30%	$ -
92	-	$ 1,485	$ -	30%	$ -
94	868	$ 1,524	$ 1,323,050	30%	$ 396,915
96	-	$ 1,562	$ -	30%	$ -
108	389	$ 1,752	$ 680,825	30%	$ 204,248
121	-	$ 1,967	$ -	30%	$ -
192	-	$ 3,340	$ -	30%	$ -
City Totals	**479,279**		**$ 211,630,917**		**$ 63,489,275**

SANITARY SEWER

The City Sanitary Sewer Master Plan states that there are 929 miles of installed sewer pipe. About 1 mile of this total is within the Port of Oakland and is not considered in this study. The City therefore owns and maintains 928 miles of sanitary sewer piping. We concur with the City that the Master Plan data is more accurate for miles of installed pipe while the GIS database is helpful for identifying pipe characteristics. The City GIS database shows a total of 886 miles of sanitary sewer pipe city-wide, which is 96% of the 928 miles of sanitary sewer piping. Of the 928 miles total installed pipe, 385 miles of sanitary sewer pipe are within rehabilitated sewersheds and all 385 miles have diameters listed in the GIS database. City of Oakland staff has stated that a total of 310 miles of sewer pipe were rehabilitated or replaced within those sewersheds or 81% of the total 385 miles of pipe. Based on discussion with City staff and review of cost information, the 310 miles of sewer pipe consist of about 260 miles of pipe that were rehabilitated and 50 miles of pipe (10” and under) that were replaced. The percentage of pipe size from the known 385 miles

was used to estimate the pipe size for the 310 miles of pipe rehabilitated and replaced. Depreciated replacement value was calculated based on the date of rehabilitation or replacement.

The length of pipeline installed prior to 1985 is 928 miles less the 310 miles rehabilitated or replaced, or a total of 618 miles. See Table 9 for sewer pipe totals. Of the 886 total miles in the City GIS database, 860 miles of pipe do not have either a date of installation listed or have a date of installation that is prior to 1985. Of those 860 miles of pipe, all 860 miles have diameters listed. The percentage of pipe size from the known 860 miles was used for the 618 miles of pipe installed prior to 1985. Anything that pre-dates 1985 has a depreciated replacement value of 30% of its replacement cost.

Table 5: Size and Distribution of Sewer Main Pipes (Includes Port of Oakland)
(City of Oakland Master Plan Report – 2014)

Pipe Diameter (in)	Length (ft)	Length (miles)	% of System(2)	Pipe Diameter (in)	Length (ft)	Length (miles)	% of System(2)
Under 8	328,831	62.3	6.7%	33	7,749	1.5	0.2%
8(1)	3,730,065	706.5	76.0%	35	658	0.1	0.0%
9	457	0.1	0.0%	36	16,441	3.1	0.3%
10	266,996	50.6	5.4%	39	3,310	0.6	0.1%
12	183,640	34.8	3.7%	42	4,801	0.9	0.1%
14	30,484	5.8	0.6%	45	1,437	0.3	0.0%
15	54,735	10.4	1.1%	48	6,101	1.2	0.1%
16	31,867	6.0	0.6%	51	276	0.1	0.0%
18	86,783	16.4	1.8%	57	2,275	0.4	0.0%
20	3,051	0.6	0.1%	58	347	0.1	0.0%
21	66,263	12.5	1.4%	60	1,504	0.3	0.0%
22	852	0.2	0.0%	63	1,005	0.2	0.0%
24	48,627	9.2	1.0%	66	5,437	1.0	0.1%
27	6,198	1.2	0.1%	Larger than 66	2,990	0.6	0.1%
30	14,310	2.7	0.3%	**Totals**	**4,907,490**	**929**	**100%**

(1) Includes 132 miles of pipe with unknown diameter
(2) Percentage by length

The following data is shown for the urban versus hill areas of the City to facilitate allocation of costs based on development density (see Appendix C), and excludes data from the Port of Oakland facilities that are limited to serving maritime and airport operations.

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Table 6: GIS Data - Size and Distribution of Sewer Main Pipes

GIS Data				*GIS Data Adjusted for Length*			
Location	Pipe Diameter (in)	Length (ft)	Length (miles)	Location	Pipe Diameter (in)	Length (ft)	Length (miles)
Urban	Under 8 inches	332,517	63	Urban	Under 8 inches	348,047	66
	8 to 12 inches	2,678,201	507		8 to 12 inches	2,803,281	531
	12 to 15 inches	212,841	40		12 to 15 inches	222,781	42
	15 to 18 inches	87,328	17		15 to 18 inches	91,406	17
	18 to 21 inches	92,117	17		18 to 21 inches	96,419	18
	21 to 24 inches	72,222	14		21 to 24 inches	75,595	14
	24 to 30 inches	55,532	11		24 to 30 inches	58,126	11
	30 to 36 inches	27,405	5		30 to 36 inches	28,685	5
	36 to 42 inches	24,237	5		36 to 42 inches	25,369	5
	42 to 48 inches	7,339	1		42 to 48 inches	7,682	1
	48 to 54 inches	10,196	2		48 to 54 inches	10,672	2
	54 to 60 inches	2,221	0		54 to 60 inches	2,325	0
	60 to 66 inches	9,219	2		60 to 66 inches	9,650	2
	Over 66 inches	2,470	0		Over 66 inches	2,585	0
	Totals	**3,613,845**	**684**		**Totals**	**3,782,622**	**716**
Hills	Under 8 inches	38,370	7	Hills	Under 8 inches	40,159	8
	8 to 12 inches	949,619	180		8 to 12 inches	993,887	188
	12 to 15 inches	34,597	7		12 to 15 inches	36,210	7
	15 to 18 inches	12,184	2		15 to 18 inches	12,752	2
	18 to 21 inches	16,432	3		18 to 21 inches	17,198	3
	21 to 24 inches	10,839	2		21 to 24 inches	11,344	2
	24 to 30 inches	2,706	1		24 to 30 inches	2,832	1
	30 to 36 inches	1,331	0		30 to 36 inches	1,393	0
	36 to 42 inches	-	-		36 to 42 inches	-	-
	Over 42 inches	340	0		Over 42 inches	356	0
	Totals	**1,066,418**	**202**		**Totals**	**1,116,131**	**211**
City Totals		**4,687,775**	**888**	**City Totals**		**4,907,490**	**928**

Table 7: Urban Area Depreciated Replacement Value - Adjusted GIS Data

Year Completed	Pipe Length 10" and Less (ft)	Pipe Length Greater than 10" (ft)	Estimated Pipe Rehabilitated in Sewersheds Completed (ft)	Estimated Pipe Rehabilitated in Undesignated Sewersheds (ft)	Total Estimated Pipe Rehabilitated (mi)	Estimated Pipe Replaced in Sewersheds Completed (ft)	Estimated Pipe Replaced in Undesignated Sewersheds (ft)	Estimated Pipe Replaced (mi)	Rehabilitation Cost ($2015)	Replacement Cost ($2015)	Rehabilitation / Replacement Cost ($2015)	Rehabilitation / Replacement Cost (Nominal $)	Total Depreciated Value ($2015)
Pre-1985	2,202,685	433,670							$ -	$ 850,061,443	$ 850,061,443		$ 255,018,433
1987	30,300	1,009	30,300	14,259	8.4	1,009	10,201	2.1	$ 11,128,566	$ 4,560,223	$ 15,688,789	$ 6,917,779	$ 5,804,852
1988	36,606	607	36,606	12,196	9.2	607	16,000	3.1	$ 12,188,424	$ 5,932,198	$ 18,120,622	$ 8,194,986	$ 7,127,445
1989	97,158	23,581	44,693		8.5	14,149		2.7	$ 11,161,997	$ 8,761,570	$ 19,923,566	$ 9,201,774	$ 8,301,486
1990	4,400	1,835	4,400	43,975	9.2	1,835	10,055	2.3	$ 12,081,564	$ 5,105,709	$ 17,187,273	$ 8,139,252	$ 7,562,400
1991	5,251	696	5,251	23,360	5.4	696	5,000	1.1	$ 7,145,564	$ 6,873,619	$ 14,019,184	$ 6,783,471	$ 6,495,555
1992	20,114	4,345	20,114	23,608	8.3	4,345	11,548	3.0	$ 10,919,565	$ 7,199,095	$ 18,118,660	$ 9,039,076	$ 8,817,748
1993	31,782	11,649	26,379		5.0	6,640		1.3	$ 6,588,170	$ 2,734,577	$ 9,322,747	$ 4,860,875	$ 4,754,601
1994	83,403	12,677	45,038	7,000	9.9	12,677		2.4	$ 12,996,396	$ 7,166,471	$ 20,162,867	$ 10,912,437	$ 10,753,529
1995	-	-	-	-	-	-	-	-	$ -	$ -	$ -	$ -	$ -
1996	27,304	-	27,304	14,921	8.0	-	7,414	1.4	$ 10,545,715	$ 2,892,852	$ 13,438,567	$ 7,558,264	$ 7,794,369
1997	203	-	102		0.0	-		-	$ 25,350	$ -	$ 25,350	$ 14,780	$ 15,294
1998	400	-	400	452	0.2	-	-	-	$ 212,836	$ -	$ 212,836	$ 126,096	$ 133,377
1999	67,312	14,175	20,194	11,191	5.9	14,175		2.7	$ 7,838,257	$ 7,166,518	$ 15,004,775	$ 9,098,363	$ 9,753,104
2000	17,161	2,005	17,161	23,088	7.6	2,005	10,000	2.3	$ 10,052,239	$ 4,288,314	$ 14,340,553	$ 8,928,097	$ 9,655,972
2001	42,274	4,528	42,274	6,000	9.1	4,528	2,000	1.2	$ 12,056,432	$ 4,027,703	$ 16,084,134	$ 10,195,500	$ 11,205,280
2002	30,131	5,423	30,131	13,000	8.2	5,423	5,000	2.0	$ 10,771,967	$ 4,950,841	$ 15,722,808	$ 10,287,452	$ 11,320,422
2003	31,882	2,532	31,882	18,000	9.4	2,532	5,000	1.4	$ 12,458,030	$ 3,130,528	$ 15,588,557	$ 10,443,978	$ 11,587,494
2004	39,640	1,041	39,640	12,000	9.8	1,041	3,000	0.8	$ 12,897,090	$ 1,443,488	$ 14,340,578	$ 10,210,985	$ 10,994,443
2005	17,576	522	17,576	27,000	8.4	522	5,000	1.0	$ 11,132,856	$ 2,318,153	$ 13,451,009	$ 10,023,272	$ 10,626,297
2006	46,398	1,146	34,335		6.5	1,146	1,833	0.6	$ 8,575,046	$ 1,063,996	$ 9,639,042	$ 7,608,738	$ 7,839,754
2007	44,876	3,547	37,247		7.1	3,547	3,000	1.2	$ 9,302,458	$ 2,681,131	$ 11,983,589	$ 10,255,406	$ 10,026,269
2008	25,750	-	25,750	13,320	7.4	-	5,000	0.9	$ 9,757,733	$ 2,047,603	$ 11,805,335	$ 10,100,188	$ 10,152,588
2009	852	-	852	2,731	0.7	-	-	-	$ 894,931	$ -	$ 894,931	$ 775,611	$ 790,522
2010	93,006	39,125	37,202		7.0	5,869		1.1	$ 9,291,299	$ 2,649,556	$ 11,940,856	$ 10,698,127	$ 10,826,376
2011	80,686	15,617	12,103		2.3	3,123		0.6	$ 3,022,699	$ 1,473,361	$ 4,496,060	$ 4,126,826	$ 4,181,336
2012	17,652	2,072	3,530		0.7	2,072		0.4	$ 881,717	$ 740,141	$ 1,621,858	$ 1,527,703	$ 1,546,171
2013	20,655	13,773	20,655	23,000	8.3	0	-	0.0	$ 10,902,836	$ -	$ 10,902,836	$ 10,548,692	$ 10,648,437
2014[(1)]	189,363	18,690		58,057	11.0	-	-	-	$ 7,987,780	$ -	$ 7,987,780	$ 7,943,094	$ 7,987,780
1985-2014 Totals	**1,102,135**	**180,595**	**611,118**	**347,158**	**181**	**87,941**	**100,051**	**36**	**$ 232,817,517**	**$ 89,207,645**	**$ 322,025,162**	**$ 204,520,825**	**$ 206,702,902**
Total													**$ 461,721,335**

(1) Total cost derived from 2014 Sanitary Sewer Collection System Annual Report

Table 8: Hill Area Depreciated Replacement Value - Adjusted GIS Data

Year Completed	Pipe Length 10" and Less (ft)	Pipe Length Greater than 10" (ft)	Estimated Pipe Rehabilitated in Sewersheds Completed (ft)	Estimated Pipe Rehabilitated in Undesignated Sewersheds (ft)	Total Estimated Pipe Rehabilitated (mi)	Estimated Pipe Replaced in Sewersheds Completed (ft)	Estimated Pipe Replaced in Undesignated Sewersheds (ft)	Estimated Pipe Replaced (mi)	Rehabilitation Cost ($2015)	Replacement Cost ($2015)	Rehabilitation / Replacement Cost ($2015)	Rehabilitation / Replacement Cost (Nominal $)	Total Depreciated Value ($2015)
Pre-1985	583,797	42,540							$ -	$ 188,859,075	$ 188,859,075		$ 56,657,723
1987	16,450	178	16,450	7,741	4.6	178	1,799	0.4	$ 6,041,746	$ -	$ 6,105,330	$ 2,692,070	$ 2,258,972
1988	14,417	-	14,417	4,804	3.6	-	-	-	$ 4,800,320	$ -	$ 4,800,320	$ 2,170,928	$ 1,888,126
1989	33,167	896	15,257		2.9	538		0.1	$ 3,810,391	$ 192,036	$ 4,002,427	$ 1,848,536	$ 1,667,678
1990	803	720	803	8,025	1.7	720	3,945	0.9	$ 2,204,885	$ -	$ 2,484,553	$ 1,176,592	$ 1,093,203
1991	5,314	-	5,314	23,640	5.5	-	-	-	$ 7,231,295	$ -	$ 7,231,295	$ 3,499,011	$ 3,350,500
1992	5,446	170	5,446	6,392	2.2	170	452	0.1	$ 2,956,545	$ 299,547	$ 3,256,093	$ 1,624,406	$ 1,584,632
1993	31,336	4,759	26,009		4.9	2,713		0.5	$ 6,495,718	$ 1,291,406	$ 7,787,124	$ 4,060,202	$ 3,971,433
1994	-	-	-	-	-	-		-	$ -	$ -	$ -	$ -	$ -
1995	35,282	1,934	35,282	16,000	9.7	1,934	8,000	1.9	$ 12,807,680	$ 3,875,875	$ 16,683,555	$ 9,134,570	$ 9,287,179
1996	3,765	-	3,765	5,079	1.7	-	2,586	0.5	$ 2,208,768	$ 1,008,774	$ 3,217,541	$ 1,809,644	$ 1,866,174
1997	85,310	11,027	42,655		8.1	11,027		2.1	$ 10,632,482	$ 5,130,861	$ 15,763,343	$ 9,190,764	$ 9,510,550
1998	18,176	7,601	18,176	20,548	7.3	7,601	10,000	3.3	$ 9,671,270	$ 7,278,056	$ 16,949,326	$ 10,041,693	$ 10,621,578
1999	22,912	4,943	6,874	3,809	2.0	4,943		0.9	$ 2,668,026	$ 1,765,692	$ 4,433,718	$ 2,688,449	$ 2,881,917
2000	1,421	-	1,421	1,912	0.6	-	-	-	$ 832,366	$ -	$ 832,366	$ 518,212	$ 560,460
2001	-	-	-	-	-	-	-	-	$ -	$ -	$ -	$ -	$ -
2002	-	-	-	-	-	-	-	-	$ -	$ -	$ -	$ -	$ -
2003	-	-	-	-	-	-	-	-	$ -	$ -	$ -	$ -	$ -
2004	-	-	-	-	-	-	-	-	$ -	$ -	$ -	$ -	$ -
2005	-	-	-	-	-	-	-	-	$ -	$ -	$ -	$ -	$ -
2006	13,774	730	10,193		1.9	730	1,167	0.4	$ 2,543,794	$ 677,763	$ 3,221,557	$ 2,542,990	$ 2,620,200
2007	-	-	-		-	-	-	-	$ -	$ -	$ -	$ -	$ -
2008	-	-	-	-	-	-	-	-	$ -	$ -	$ -	$ -	$ -
2009	13,033	1,478	13,033	21,589	6.6	1,478	4,000	1.0	$ 8,646,768	$ 1,956,800	$ 10,603,568	$ 9,189,814	$ 9,366,485
2010	-	-	-		-	-		-	$ -	$ -	$ -	$ -	$ -
2011	162,855	10,494	24,428		4.6	2,099		0.4	$ 6,093,912	$ 827,106	$ 6,921,019	$ 6,352,638	$ 6,436,547
2012	123,570	10,228	24,714		4.7	10,228		1.9	$ 6,161,333	$ 3,695,427	$ 9,856,760	$ 9,284,541	$ 9,396,778
2013	-	-	-	-	-	-	-	-	$ -	$ -	$ -	$ -	$ -
2014[(1)]	96,911	11,957		29,712	5.6	-	-	-	$ 4,087,936	$ -	$ 4,087,936	$ 4,065,066	$ 4,087,936
1985-2014 Totals	683,942	67,115	264,236	149,251	78	44,358	31,949	14	$ 99,895,233	$ 27,999,346	$ 128,237,830	$ 81,890,126	$ 82,450,347
Total													$ 139,108,070

(1) Total cost derived from 2014 Sanitary Sewer Collection System Annual Report

Table 9: Sewer Installation by Year - Adjusted GIS Data

	Core			Hills			
Year Completed	Estimated Pipe Rehabilitated (mi)	Estimated Pipe Installed (mi)	Total Pipe (mi)	Estimated Pipe Rehabilitated (mi)	Estimated Pipe Installed(mi)	Total Pipe (mi)	City-wide Total Pipe (mi)
Pre-1985	0.0	499.3	499.3	0.0	118.6	118.6	617.9
1987	8.4	2.1	10.6	4.6	0.4	5.0	15.5
1988	9.2	3.1	12.4	3.6	0.0	3.6	16.0
1989	8.5	2.7	11.1	2.9	0.1	3.0	14.1
1990	9.2	2.3	11.4	1.7	0.9	2.6	14.0
1991	5.4	1.1	6.5	5.5	0.0	5.5	12.0
1992	8.3	3.0	11.3	2.2	0.1	2.4	13.7
1993	5.0	1.3	6.3	4.9	0.5	5.4	11.7
1994	9.9	2.4	12.3	0.0	0.0	0.0	12.3
1995	0.0	0.0	0.0	9.7	1.9	11.6	11.6
1996	8.0	1.4	9.4	1.7	0.5	2.2	11.6
1997	0.0	0.0	0.0	8.1	2.1	10.2	10.2
1998	0.2	0.0	0.2	7.3	3.3	10.7	10.8
1999	5.9	2.7	8.6	2.0	0.9	3.0	11.6
2000	7.6	2.3	9.9	0.6	0.0	0.6	10.5
2001	9.1	1.2	10.4	0.0	0.0	0.0	10.4
2002	8.2	2.0	10.1	0.0	0.0	0.0	10.1
2003	9.4	1.4	10.9	0.0	0.0	0.0	10.9
2004	9.8	0.8	10.5	0.0	0.0	0.0	10.5
2005	8.4	1.0	9.5	0.0	0.0	0.0	9.5
2006	6.5	0.6	7.1	1.9	0.4	2.3	9.4
2007	7.1	1.2	8.3	0.0	0.0	0.0	8.3
2008	7.4	0.9	8.3	0.0	0.0	0.0	8.3
2009	0.7	0.0	0.7	6.6	1.0	7.6	8.3
2010	7.0	1.1	8.2	0.0	0.0	0.0	8.2
2011	2.3	0.6	2.9	4.6	0.4	5.0	7.9
2012	0.7	0.4	1.1	4.7	1.9	6.6	7.7
2013	8.3	0.0	8.3	0.0	0.0	0.0	8.3
2014	11.0	0.0	11.0	5.6	0.0	5.6	16.6
1985-2014 Totals	**181.5**	**35.6**	**217.1**	**78.3**	**14.5**	**92.8**	**309.9**
Total							**928**

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APPENDIX B

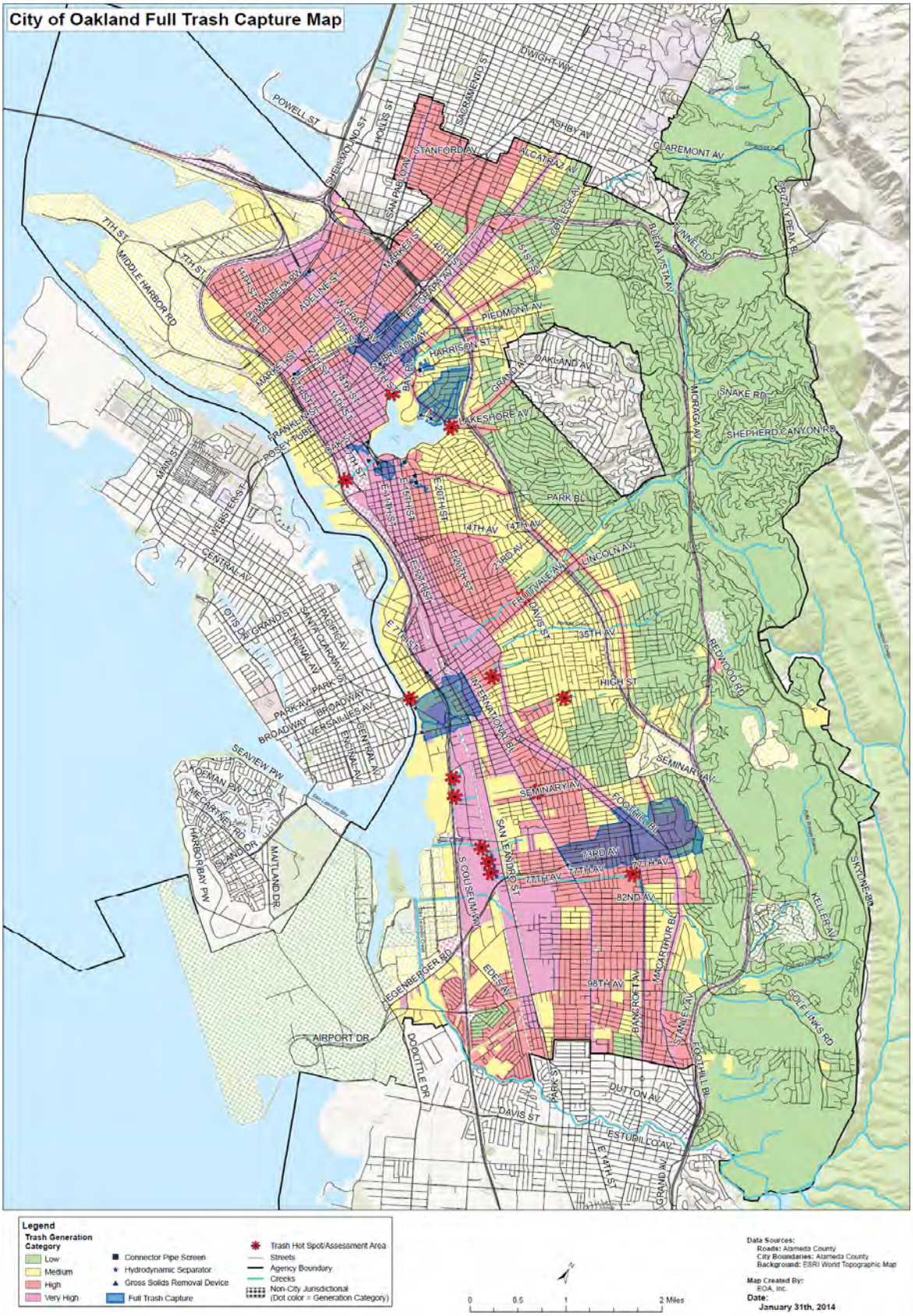

Figure 3.2 Full Trash Capture Devices

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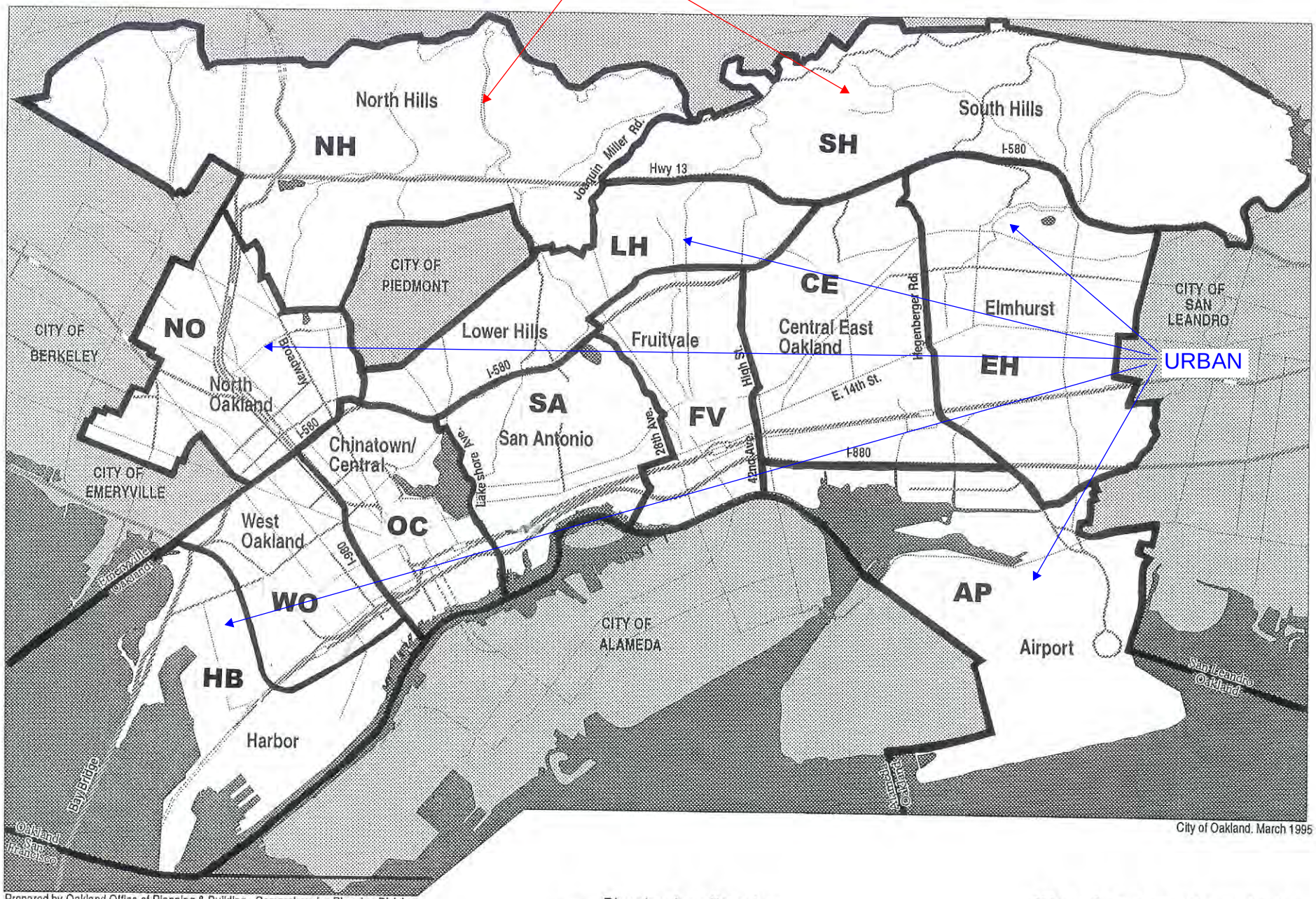
APPENDIX C



Planning Area Boundaries

Map I-1

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APPENDIX D

Table 10 - Average Flow Rate on Specific Developments

Development	Ave Daily Flow, gpd/unit	Unit
Auditorium	5	Seat
Automobile parking	25	1000 Gross square feet
Automobile repair garage	100	1000 Gross square feet
Bakery	300	1000 Gross square feet
Bar	20	Seat
Cafeteria	50	Seat
Carwash – coin operated	206	Stall
Carwash – in bay	412	5 gallons per minute (peak)
Church – fixed seat	5	Seat
Commercial	100	1000 Gross square feet
Community center	5	Occupant
Gymnasium	300	1000 Gross square feet
Hospital - Convalescent	85	Bed
Hospital – dog and cat	300	1000 Gross square feet
Hospital – non-profit	85	Bed
Hospital - surgical	500	Bed
Industrial	412	Gallons per minute (peak)
Jail	85	Inmate
Dog kennel / open	100	1000 Gross square feet
Laboratory - commercial	300	1000 Gross square feet
Laundromat - industrial	412	Gallons per minute (peak)
Laundromat	220	Washer
Manufacturing - industry	100	1000 Gross square feet
Medical building	300	1000 Gross square feet
Motel	150	Room
Office building	200	1000 Gross square feet
Dormitory – college or residential	85	Student
Residential – townhouses, set grade	330	Dwelling unit
Residential – bachelor/single	100	Dwelling unit
Residential – 1 bedroom apartment or condominium	150	Dwelling unit
Residential – 2 bedrooms apartment or condominium	200	Dwelling unit
Residential – 3 bedrooms apartment of condominium	250	Dwelling unit
Residential – boarding house	85	Bed
Residential - duplex	300	Dwelling unit
Residential – mobile home	200	Home space
Residential – single family dwelling	330	Dwelling unit
Residential – artist dwelling (2/3 area)	300	1000 Gross square feet
Residential – artist dwelling	100	Dwelling unit

Table 10 - Average Flow Rate on Specific Developments (cont'd)

Development	Ave Daily Flow, gpd/unit	Unit
Residential – guest house with kitchen	330	Dwelling unit
Rest home	85	Bed
Restaurant – fixed seat	50	Seat
Restaurant – take out	300	1000 Gross square feet
Retail area	100	1000 Gross square feet
School – day care center	10	Child
School – elementary / junior high	10	Student
School – high school	15	Student
School - kindergarten	10	35 Gross square feet
Theater – fixed seat	5	Seat

Conversion Factors:

cfs = 449 gpm

MGD = 1.55 cfs = 695 gpm

cu ft = 7.48 gal

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APPENDIX E

3.5. Retention Facilities

Retention facilities do not have surface outflow and rely instead on percolation and/or evaporation to dispose runoff. The facility shall be designed such that the water surface returns to its original elevation within 48 hours, after the cessation of a 100-year, 24-hour rainstorm over the contributory watershed. The volume of storm water shall be calculated as follows:

$$V_w = 0.021\ (P)(A) \qquad (19)$$

where:

V_w = volume of water to be stored (acre-feet)
P = annual precipitation at the center of gravity of the watershed basin (inches)
A = drainage area (acres)

One foot of freeboard is required for all retention basins.

3.6. Detention Facilities

The City's drainage system may not have the required capacity to handle additional storm water. In most cases, and to the extent possible, the City requires that developments shall detain storm water.

Detention facilities are those facilities designed to reduce the rate of discharge from a drainage area into a receiving waterway. One of the common uses for a detention facility is limiting the discharge rate. Private parties such as developments or project owners are responsible for detention facilities. The following suggested development features may be utilized as detention basins:

1. Parking lot detention for industrial/business development. Using this method requires the filing of notice with the beneficiaries of the improvement and the City. Parking lots shall provide pedestrian access through the ponded areas. Depths of ponding shall not exceed four (4) inches.

2. Conduit storage can be utilized by oversizing the underground drainage facilities. Care should be taken to prevent siltation problems.

3. Channel storage can be utilized by oversizing. Care should be taken to prevent siltation problems, and allowances must be made for minimum capacity at maximum silt buildup.

4. Multi-purpose facilities can be used as detention facilities such as park areas, tennis courts, parking areas, and landscaped areas. Existing ponds and wetland areas may not be suitable to receive additional storm water or change in the flow of storm water due to existing ecological balance. Additional studies may be needed to add storm water to an existing pond or wetland.

The detention pond shall be designed such that the water surface returns to its base or starting elevation within 24 hours after the cessation of a 24-hour, 100-year storm.

3.6.1- Design Procedure

Detention basins shall be designed to delay the flow of urban runoff from the development site such that post-project discharge rate would not exceed the pre-project flow rate. In addition, to the maximum extent possible, the existing peak discharge may be reduced by a factor of 25%. This goal may be achieved by including commonly used post construction and best management practice features that are proposed in the Alameda County-wide Clean Water Program (C.3 Requirements) and other resources listed in the Reference section of these Standards.

Procedures stated below are common in planning and designing detention systems and shall incorporate the aforementioned post construction best management practices for water quality control, pervious ground cover, and runoff attenuation.

1. For single-family homes and single lot improvements, builders and developers are encouraged to employ concepts of bio-retention, swales, pervious pavers, rain barrels, cisterns, tree wells, and other commonly used features listed in the Reference section of these Standards to treat the storm water and reduce the peak flow. The Modified Triangular Hydrograph Method with the method described in Section 6.1 of these Standards can be used to calculate the detentions volume.

2. For commercial and multi-unit development projects 50 acres and less, use the Modified Triangular Hydrograph Method with the method described in Section 6.1 of these Standards to calculate the detentions volume.

3. For development projects, grading, and alterations to ground cover exceeding 50 acres but less than 640 acres, calculate the existing 15- and 100-year peak discharges using the methods described in Section 6.1 of these Standards to establish a baseline (existing conditions) hydrograph. Create a new hydrograph using the same Standards to represent the development or changes in the ground cover and topography.

   Compare the new 100-year hydrograph with the baseline 100-year hydrograph for any increase in the flow. A continuous base flow of 7 cubic feet per second for the 15-year hydrograph and 10 cubic feet per second for the 100-year hydrograph may be considered. Detention volume shall be calculated by subtracting the baseline 100-year hydrograph from the new 100-year hydrograph multiplied by a factor of three.

Size the discharge outlet using the 15-year baseline flow in a manner that at least two feet of freeboard is provided from the water level in the detention facility to the crest of the overflow spillway. Design an overflow spillway to pass the 100-year baseline flow in a manner that at least two feet of freeboard is provided from the water surface over the spillway to the top of the dike protecting the detention facility. Be certain that the detention basin returns to the starting elevation within 24 hours of the end of the 100-year storm event.