



**OAKLAND AFFORDABLE HOUSING IMPACT FEE
NEXUS ANALYSIS**

Prepared for
CITY OF OAKLAND

This Report Prepared by
VERNAZZA WOLFE ASSOCIATES, INC.
and
HAUSRATH ECONOMICS GROUP

March 10, 2016

TABLE OF CONTENTS

I.	EXECUTIVE SUMMARY	iv
II.	INTRODUCTION AND APPROACH	1
III.	NEXUS ANALYSIS METHODOLOGY	3
IV.	NEXUS ANALYSIS CALCULATIONS.....	4
	Step 1: Residential Development Prototypes.....	5
	Step 2: Household Incomes of Buyers and Renters.....	7
	Job Growth, Demand for Affordable Housing, and Maximum Legal Affordable Housing Impact Fees	11
	Steps 3, 4, and 5: Household Consumer Spending and Job Growth.....	11
	Steps 6 and 7: New Worker Households and Household Incomes.....	11
	Steps 8 and 9: Demand for Affordable Housing and The Affordability Gap.....	12
	Step 10: Maximum Legal Affordable Housing Impact Fees	12
	Steps 3-10: Nexus Calculations for Housing Development Prototypes	12
V.	IMPACT FEE PROGRAM AND POLICY CONSIDERATIONS.....	22
	Economic Feasibility Considerations	22
	Consideration of Transportation and Capital Facilities Fees in Addition.....	22
	Fee Revenue Deposited in Affordable Housing Trust Fund.....	22
	On-Site Affordable Housing Option Possible.....	22
	Affordable Housing Impact Fees as Part of Broader Housing Equity Strategy and Initiatives in Oakland.....	23
VI.	ADMINISTRATIVE ISSUES	23
	APPENDIX A: IMPLAN METHODOLOGY AND INDUCED JOBS AND WAGES	A-1
	Multiplier Impact Analysis Methodology Overview	A-1
	Summary Tables of Induced Employment Impacts.....	A-2
	APPENDIX B: HOUSING AFFORDABILITY GAP ANALYSIS	B-1
	Estimating Affordable Rents and Sales Prices.....	B-1
	Estimating Housing Development Costs	B-6
	Calculating the Housing Affordability Gap.....	B-7

LIST OF TABLES

Table 1	Summary of Maximum Legal Affordable Housing Impact Fees	v
Table 2	For-Sale Housing Prototypes: Characteristics and Assumptions.....	6
Table 3	Rental Housing Prototypes: Characteristics and Assumptions.....	7
Table 4	Household Income Calculations for Prototype For-Sale Homes	8
Table 5	Household Income Calculations for Prototype Rental Housing Development	9
Table 6	Household Income Distributions Used in IMPLAN3 Analysis of For-Sale Prototypes	10
Table 7	Household Income Distributions Used in IMPLAN3 Analysis of Rental Prototypes.....	10
Table 8	Summary of Job Growth and Affordable Housing Impacts Linked to New Residential Development	13
Table 9	Calculations of Affordability Gap and Maximum Legal Affordable Housing Impact Fees; Prototype H-1A: Single-Family Detached Homes-Urban .	15
Table 10	Calculation of Affordability Gap and Maximum Legal Affordable Housing Impact Fees; Prototype H-1B: Single-Family Detached Homes-Hills ..	16
Table 11	Calculation of Affordability Gap and Maximum Legal Affordable Housing Impact Fees; Prototype H-2A: Townhomes/Row Houses-Urban	17
Table 12	Calculation of Affordability Gap and Maximum Legal Affordable Housing Impact Fees; Prototype H-2B: Townhomes/Row Houses-Hills.....	18
Table 13	Calculation of Affordability Gap and Maximum Legal Affordable Housing Impact Fees; Prototype H-3: Lower/Mid-Rise Rental Apartments.....	19
Table 14	Calculation of Affordability Gap and Maximum Legal Affordable Housing Impact Fees; Prototype H-4: Mid-Rise Rental Apartments	20
Table 15	Calculation of Affordability Gap and Maximum Legal Affordable Housing Impact Fees; Prototype H-5: High-Rise Rental Apartments	21

LIST OF FIGURES

Figure 1	Maximum Legal Affordable Housing Impact Fees Nexus Analysis	2
----------	---	---

LIST OF APPENDIX TABLES

Table A-1	Summary of Induced Employment Impacts by Occupation, Prototype H-1A: Single-Family Detached Homes-Urban	A-3
Table A-2	Summary of Induced Employment Impacts by Occupation, Prototype H-1B: Single-Family Detached Homes-Hills.....	A-4
Table A-3	Summary of Induced Employment Impacts by Occupation, Prototype H-2A: Townhomes/Row Houses-Urban	A-5
Table A-4	Summary of Induced Employment Impacts by Occupation, Prototype H-2B: Townhomes/Row Houses-Hills.....	A-6
Table A-5	Summary of Induced Employment Impacts by Occupation, Prototype H-3: Lower/Mid-Rise Rental Apartments	A-7
Table A-6	Summary of Induced Employment Impacts by Occupation, Prototype H-4: Mid-Rise Rental Apartments	A-8
Table A-7	Summary of Induced Employment Impacts by Occupation, Prototype H-5: High-Rise Rental Apartments	A-9
Table B-1	Unit Types and Household Sizes Used in Housing Affordability Gap Analysis.....	B-2
Table B-2	Income Assumptions by Tenure Used in Affordability Gap Analysis	B-2
Table B-3	City of Oakland Income Limits By Tenure for Affordability Gap Analysis	B-3
Table B-4	Affordable Rent Calculations by Income Level and Unit Type	B-4
Table B-5	Affordable Sales Price Calculations by Income Level and Unit Type	B-5
Table B-6	Unit Types, Sizes, and Costs Used in Housing Affordability Gap Analysis	B-7
Table B-7	Rental Housing Affordability Gap Calculations.....	B-9
Table B-8	For-Sale Housing Affordability Gap Calculations	B-10
Table B-9	Combined Average Affordability Gap by Income Group	B-11

EXECUTIVE SUMMARY

The City of Oakland seeks to adopt affordable housing impact fees on new market-rate residential development to fund affordable housing development. In order to establish impact fees, nexus studies are required under California law (the Mitigation Fee Act). Nexus studies must establish the reasonable relationship or connection between new development and the impact fee charged. In the case of affordable housing impact fees, the nexus analysis establishes the link between new market-rate residential development, the growth of employment associated with the consumer expenditures of new residents, and the demand for affordable housing to accommodate the new worker households. The impact fee calculations quantify the cost per new market-rate unit to fund the gap between what moderate- and lower-income worker households can pay for housing and the cost to produce that housing.

The peer-validated methodology for an affordable housing nexus analysis is based on generally accepted economic impact modelling techniques. Major steps in the analysis include the following:

- Define housing prototype projects for new market-rate residential development in Oakland.
- Estimate household income distributions of new market-rate owner and renter households in Oakland, their consumer expenditures, and the employment growth in Oakland supported by their increased spending on services and retail goods.
- Estimate the number of new households associated with this job growth (worker households) and their associated household incomes.
- Estimate the number of new worker households that are moderate income or below.
- Calculate the gap between the cost to develop affordable housing and the ability of moderate- and lower-income households to afford that housing (affordability gap).
- Calculate the maximum legal impact fee per market rate housing unit based on the affordability gap for new worker households associated with that unit.

This report describes the nexus analysis methodology and assumptions and presents the nexus calculations. Table 1 summarizes the results of the study; it identifies the **maximum legal affordable housing impact fees** calculated for the different types of housing development in Oakland. Based on the nexus analysis, the City Council can adopt fees at or below the maximum legal fee amounts identified.

Table 1
Summary of Maximum Legal
Affordable Housing Impact Fees

Type of Residential Development in Oakland	Maximum Legal Impact Fee Per Dwelling Unit
Single-Family Homes - Urban	\$34,833
Single-Family Homes - Hills	\$81,729
Townhomes - Urban	\$44,693
Townhomes - Hills	\$53,258
Multi-Family - Lower/Mid-Rise	\$35,172
Multi-Family - Mid-Rise	\$39,887
Multi-Family - High-Rise	\$50,804

After reviewing the results of nexus analyses and considering the broad range of local policy goals, decision-makers can adopt fees up to the maximum justified by the nexus analysis. Economic feasibility considerations typically result in adopted fees at levels below the maximum legal amounts to avoid affecting the amount and pace of new housing development. To support development of housing for all income levels, impact fee proposals seek to balance the need for more affordable housing with not impeding the construction of new market-rate housing.

Oakland has already adopted a Jobs-Housing Impact Fee which became effective July 1, 2005 on office and warehouse development for developers to contribute to mitigating the increased demand for affordable housing generated by these types of non-residential development. The adoption of a city-wide affordable housing impact fee program for residential development is one of a number of new initiatives and strategies underway to support new affordable housing production and address a range of housing affordability needs in Oakland.

Revenue from new affordable housing impact fees would be deposited into the City's Affordable Housing Trust Fund. The Trust Fund also collects funds from other sources such as the existing Jobs-Housing Impact Fee and the 25 percent allocation of former redevelopment tax increment funds set aside for affordable housing (i.e., "boomerang funds"). Through the Affordable Housing Trust Fund, the City provides funding to affordable housing projects. Through the Trust Fund, fee revenue can be leveraged by a factor of more than 3:1 to produce more affordable units. It is also possible to provide on-site and/or off-site affordable housing development options as alternatives to payment of the impact fee.

CITY OF OAKLAND

AFFORDABLE HOUSING IMPACT FEE NEXUS ANALYSIS

INTRODUCTION AND APPROACH

The City of Oakland seeks to adopt city-wide affordable housing impact fees on new market-rate residential development to fund affordable housing development. The intent of the fees would be for developers to contribute to producing affordable housing to offset the impacts of an increase in demand for affordable housing due to increases in consumer spending and employment associated with new market-rate residential development. Oakland has already adopted a Jobs-Housing Impact Fee effective July 1, 2005 which is based on the demand for affordable housing due to employment growth associated with new office and warehouse/distribution developments.

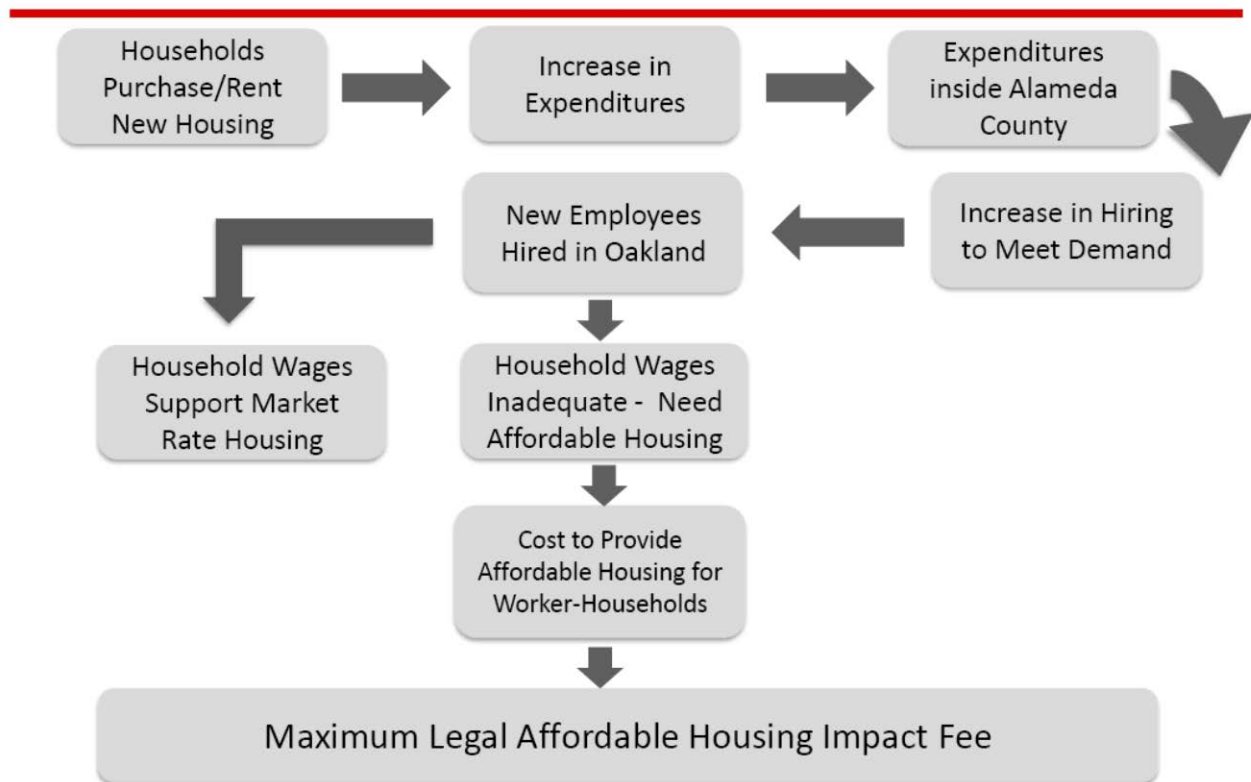
In order to establish impact fees, nexus studies are required under California law (the Mitigation Fee Act). Nexus studies must establish the reasonable relationship or connection between new development and the impact fee that is charged. In the case of residential development, a nexus study establishes and quantifies a reasonable relationship between new market-rate residential development, the growth of employment associated with the consumer expenditures of new residents, and the demand for affordable housing to accommodate the new worker households. Nexus studies for school impact fees, transportation impact fees, and capital facilities fees are common. Although nexus studies for housing impact fees are less common, a peer-validated methodology exists that establishes a connection between the development of market rate housing and the need to expand the supply of affordable housing. This study is based on this methodology.

The approach for this nexus study is to first quantify the household income and spending of the households moving into new market-rate housing developed in Oakland, and then to estimate the number of new workers at various wage levels hired in Oakland as a result of this increase in economic activity in the City. Many of the new jobs will be at lower-wage rates in retail trade and services. Since many lower-wage households cannot reasonably afford to pay for market rate rental and for-sale housing in Oakland, a housing impact fee can be justified to bridge the difference or “gap” between what the new worker households can afford to pay and the costs of developing new housing units for them. This difference is referred to in this study as the “affordability gap.”

Figure 1 presents a diagram of the nexus connection between the development of new market-rate housing in Oakland and the associated demand for additional affordable housing.

Figure 1

Maximum Legal Affordable Housing Impact Fee Nexus Analysis



NEXUS ANALYSIS METHODOLOGY

The nexus methodology requires a series of linked calculations that are undertaken in four stages. The *first stage* defines the prototypes for new market-rate housing development in Oakland and develops estimates of household incomes for the buyers and renters of the new units. The *second stage* estimates expenditures for retail goods and services by households in the new market-rate housing. The *third stage* estimates the multiplier effects that this new consumer demand would create in terms of employment and labor income within the County, a portion of which can be allocated to the City of Oakland. The *fourth stage* is to estimate the costs of providing housing that is affordable to new worker households in Oakland that are moderate-income and below. The maximum legal affordable housing impact fees are based on those costs.

The ten step-by-step calculations of the four stages are summarized below and detailed in the rest of this report.

Stage I: New Housing, Households, and Incomes

- STEP 1. Define *prototypes for new market-rate residential development* in Oakland. Seven prototypes span a range of building types and market areas. Unit sizes and sales prices and rents are based on recent projects in Oakland.
- STEP 2. Estimate the *household income distributions* of owner and renter households in new market-rate housing development in Oakland. These incomes are based on current market-rate sales prices and rents and assumptions about the relationship between housing costs and household income.

Stage II: Household Consumer Expenditures

- STEP 3. After adjustments to gross household incomes to account for the payment of income taxes and savings, compute total *consumer expenditures of buyer and renter households* for each prototype. The economic model used in this study to forecast induced employment impacts (IMPLAN3) provides consumer expenditure estimates within all of Alameda County, not just the City of Oakland.^{1,2}

¹ The multiplier calculations use IMPLAN3, an input-output economic model developed for the national economy that is customized for a regional and county economy as well. It is assumed that buyers of new housing units and renters of new apartment units in the City of Oakland increase demand for goods and services within Alameda County. This demand is based on the projected incomes of these new buyers and renters. IMPLAN3 translates the increased demand to “induced” job growth.

² If the multiplier analysis tried to focus only on the City of Oakland, results would not be as accurate. The IMPLAN3 model can provide estimates of expenditures for zip codes. However, zip codes do not accurately conform to Oakland’s boundaries and the results is less accurate at the smaller, zip code level.

Stage III: Multiplier Effects of New Consumer Demand

- STEP 4. Estimate the number of *new jobs supported by the increase in spending* on services and retail goods. The IMPLAN3 model generates an estimate of the number of jobs (direct and induced) by worker income categories that are associated with the spending of resident households for each housing development prototype.¹ The nexus analysis focuses on the induced jobs—those jobs supported by the increase in spending on services and retail goods.
- STEP 5. Identify the *new jobs to be located in Oakland* as a share of the increase in induced jobs as calculated for Alameda County.
- STEP 6. Estimate the number of *new households associated with the induced job growth in Oakland* by dividing the number of new jobs by the average number of workers per household with workers in Oakland.
- STEP 7. Estimate the *household incomes of new worker households*. This calculation assumes the additional worker’s income is the same as the initial worker’s income defined by the IMPLAN3 model.

Stage IV: Cost to Provide Affordable Housing and Maximum Legal Fees

- STEP 8. Estimate the number of *new worker households that are moderate-income or below* whose affordable housing needs should be accommodated in Oakland. Since the focus of this housing impact fee analysis is on affordable housing needs, new worker households above moderate income are not carried forward into the final impact calculations.
- STEP 9. Calculate the “*affordability gap*” for households in the different housing affordability categories (moderate-income, low-income, and very low-income). The affordability gap is defined as the difference between the cost to produce new modest housing units and what households with very-low, low-, and moderate- incomes can afford to pay for housing.
- STEP 10. Then, calculate the *maximum legal affordable housing impact fee per unit* by Oakland prototype by dividing the total aggregate affordability gap for a typical project of each prototype by the number of units assumed for that project.

NEXUS ANALYSIS CALCULATIONS

The following sections describe the nexus analysis calculations, identify assumptions, and present the results. They are ordered according to steps listed above. As identified, Appendix A and Appendix B provide more detailed background on aspects of the analysis.

STEP 1: Residential Development Prototypes

The residential development prototypes establish the types of market rate housing development that are occurring or are expected to occur in Oakland that could potentially be subject to affordable housing impact fees. The prototypes also identify the rents and prices for each expected housing type. While these prototypes are based on actual and proposed developments, they are not intended to represent specific development projects. Instead, they illustrate the types of projects and typical characteristics of new residential development likely to be built in Oakland in the near future.

Based on recent and proposed development, market data, and developer interviews, the Consultant Team constructed rental and for-sale housing prototypes. The for-sale housing prototypes include single-family detached homes and townhomes, with higher and lower market prices depending on submarket and location within the city. The rental housing prototypes include multi-family housing developments at different densities and locations, representing lower/mid-rise, mid-rise, and high-rise apartment developments. Tables 2 and 3 that follow identify the housing prototypes and present the assumptions for unit mix, rents, and prices as of the time of the analysis (mid-2015).

The four single-family detached and townhome development prototypes are described in Table 2.

- ◆ For the *single-family detached* developments, one prototype reflects in-fill homes in the lower price ranges, primarily built in East Oakland. A second prototype consists of larger, more expensive homes built in the Oakland Hills and in Rockridge.
- ◆ For the *townhome* developments, one prototype represents new townhome developments in the lower/mid-level price ranges, primarily being built in West Oakland and nearby parts of North Oakland. The second prototype includes more expensive townhomes built in the North and South Hills.

Table 2
For-Sale Housing Prototypes: Characteristics and Assumptions

Housing Type and Location	Percentage by Unit Type / Size	Bedrooms/ Bathrooms	Unit Size (sq. ft.)	Sales Prices (mid-2015)
H-1A: Single-Family Detached Homes Urban Infill/East Oakland primarily	100%	3 BR/3 BA	1,600	\$405,000
H-1B: Single-Family Detached Homes North/South/Lower Hills, Rockridge	100%	4 BR/3 BA	3,000	\$1,240,000
H-2A: Townhomes / Row Houses Urban Infill/West Oakland and parts of North Oakland	25%	2 BR/2 BA	1,185	\$490,000
	65%	2 BR/2.5 BA	1,370	\$520,000
	<u>10%</u>	<u>3 BR/3 BA</u>	<u>1,550</u>	<u>\$575,000</u>
	100%	<i>Weighted Avg:</i>	1,340	\$518,000
H-2B: Townhomes / Row Houses North Hills, South Hills	10%	2 BR/2.5 BA	1,500	\$630,000
	10%	3 BR/3 BA	1,750	\$740,000
	30%	3 BR/3 BA	2,050	\$775,000
	35%	3+ BR/3 BA	2,200	\$800,000
	<u>15%</u>	<u>4 BR/3 BA</u>	<u>2,500</u>	<u>\$850,000</u>
	100%	<i>Weighted Avg:</i>	2,085	\$777,000

Note: Additional description of the residential development prototypes, including examples of recent and proposed projects, is provided in the Economic Feasibility Study Report.

Source: Hausrath Economics Group

The rental housing development prototypes also vary by building type and location, as described in Table 3.

- ◆ The *lower/mid-rise apartment developments* (three to four floors over podium) typically occur in West Oakland, parts of North Oakland, and East Oakland. Apartment rents are generally lower for this prototype than for the higher density multi-family apartment developments.
- ◆ *Mid-rise apartment developments* (typically five to six floors over podium) are being developed in the Greater Downtown (Downtown, Jack London, and Broadway Valdez), parts of North Oakland, and parts of the Estuary Waterfront. This development prototype typically obtains higher rents than the lower/mid-rise prototype described above.
- ◆ *High-rise developments* in prime locations obtain the highest rents. They are primarily located along/near Lake Merritt, along/near the Estuary, and along Broadway in Downtown and the Jack London District.

Table 3
Rental Housing Prototypes: Characteristics and Assumptions

Housing Type and Location	Percentage by Unit Type/Size	Bedrooms/ Bathrooms	Unit Size (sq. ft.)	Monthly Rents (mid-2015)
H-3: Lower- and Mid-Rise Apartments	15%	Studio	400	\$1,500
(3-4 floors over podium)	45%	1 BR/1 BA	700	\$2,350
West Oakland/ East Oakland/ parts of North Oakland/a/	32%	2 BR/2 BA	900	\$2,900
	8%	<u>3 BR/2 BA</u>	<u>1,200</u>	<u>\$4,000</u>
	100%	<i>Weighted Avg:</i>	760	\$2,530
H-4: Mid-Rise Apartment Development	17%	Studio	550	\$2,350
(5-6 floors over podium)	50%	1 BR/1 BA	740	\$2,750
Downtown/Jack London/ Broadway Valdez/ parts of North Oakland/a/	30%	2 BR/2 BA	1,080	\$3,900
	3%	<u>2+ BR/2 BA</u>	<u>1,200</u>	<u>\$4,400</u>
	100%	<i>Weighted Avg:</i>	825	\$3,080
H-5: High-Rise Apartment Development	24%	Studio	550	\$2,700
(Prime Sites)	50%	1 BR/1 BA	840	\$3,700
Downtown/Jack London/Broadway Valdez/ parts of Estuary Waterfront	25%	2 BR/2 BA	1,100	\$5,200
	1%	<u>3 BR Penthouse</u>	<u>1,800</u>	<u>\$7,200</u>
	100%	<i>Weighted Avg:</i>	845	\$3,870

Note: Additional description of the residential development prototypes, including examples of recent and proposed projects, is provided in the Economic Feasibility Study Report.

/a/ North Oakland includes several different areas which serve different sub-markets. H-3 developments are occurring in the westerly parts of North Oakland near Emeryville and West Oakland. The H-4 developments are being planned in Rockridge and at 51st and Broadway, oriented for a higher-rent consumer.

Source: Hausrath Economics Group

It should be noted that the slowdown in new residential development that characterized both the state and the nation also impacted the City of Oakland. There was very little, new market-rate residential construction in Oakland during the period 2008-2014, and the housing market recently began showing signs of recovery in 2013-2015.

STEP 2: Household Incomes of Buyers and Renters

The sales prices and rents of the new single-family homes, townhomes, and apartment units are used to estimate the potential incomes of buyers and renters who would move into new units in each of the prototype housing projects. Threshold incomes needed to purchase or rent units are based on standards used in the housing industry. Tables 4 and 5 present information on the estimated household incomes of buyers of single-family detached homes, buyers of townhomes, and renters of apartment units. Income information is estimated for each prototype development.

Table 4
Household Income Calculations for Prototype For-Sale Homes

	H-1: Single-Family Detached		H-2: Townhomes / Row Houses					
	A. Urban Infill/ East Oakland primarily	B. North, South, Lower Hills, Rockridge	A. Urban Infill/West Oakland and parts of North Oakland		B. North Hills, South Hills			
Unit Type	3 BR/3BA	4 BR/3BA	2 BR/ 2 BA	2 BR/ 2.5 BA	3 BR/ 3 BA	3 BR/ 3 BA	3+ BR/ 3 BA	4 BR/ 3 BA
Sales Prices (mid-2015)	\$405,000	\$1,240,000	\$490,000	\$520,000	\$575,000	\$740,000	\$775,000	\$850,000
Down Payment/a/	\$81,000	\$248,000	\$98,000	\$104,000	\$115,000	\$148,000	\$155,000	\$170,000
Loan Amount	\$324,000	\$992,000	\$392,000	\$416,000	\$460,000	\$592,000	\$620,000	\$680,000
Monthly Debt Service/b/	\$1,570	\$4,594	\$1,900	\$2,016	\$2,229	\$2,869	\$3,005	\$3,296
Annual Debt Service	\$18,843	\$55,129	\$22,798	\$24,194	\$26,753	\$34,430	\$36,058	\$39,547
Annual Property Taxes/c/	\$4,788	\$14,658	\$5,792	\$6,147	\$6,797	\$8,748	\$9,161	\$10,048
Annual Maintenance Costs/d/	\$4,050	\$12,400	\$5,750	\$5,900	\$6,175	\$8,200	\$8,375	\$8,750
Fire and Hazard Insurance/e/	\$1,418	\$4,340	\$1,715	\$1,820	\$2,013	\$2,590	\$2,713	\$2,975
Annual Costs	\$29,098	\$86,527	\$36,055	\$38,061	\$41,737	\$53,967	\$56,307	\$61,320
Household Income/f/	\$96,994	\$288,424	\$120,184	\$126,869	\$139,124	\$179,890	\$187,689	\$204,401

/a/ 20% downpayment assumed. Market rate buyers are assumed to finance 80% of the sales prices.

/b/ 30-year loan at 4.125% annual interest rate for all for-sale prototypes except single-family homes in the Hills/Rockridge areas – for which a lower Jumbo loan rate of 3.750% applies. (August 21, 2015 Wells Fargo Website - FNMA Loan <https://www.wellsfargo.com/mortgage/rates/>)

/c/ 1.35% of sales price (based on the average property tax rate across all tax rate areas in the City of Oakland).

/d/ Annual maintenance and repair allowance estimated at 1% of sales price.

/e/ Annual fire and hazard insurance estimated at 0.35% of sales price.

/f/ Assumes 30% of gross annual household income allocated to housing costs.

Sources: Vernazza Wolfe Associates Inc. and Hausrath Economics Group.

Table 5
Household Income Calculations for Prototype Rental Housing Development

Unit Type	Studio	1 BR/1 BA	2 BR/2 BA	3 BR/2 BA
H-3: Lower- and Mid-Rise Apartments				
(West Oakland/East Oakland/ parts of North Oakland)				
Average Monthly Rent (mid-2015)	\$1,500	\$2,350	\$2,900	\$4,000
Annual Housing Rent	\$18,000	\$28,200	\$34,800	\$48,000
Household Income^{/a/}	\$60,000	\$94,000	\$116,000	\$160,000
H-4: Mid-Rise Apartment Developments				
(Downtown/Jack London/Broadway Valdez/ parts of North Oakland)				
Average Monthly Rent (mid-2015)	\$2,350	\$2,750	\$3,900	\$4,400
Annual Housing Rent	\$28,200	\$33,000	\$46,800	\$52,800
Household Income^{/a/}	\$94,000	\$110,000	\$156,000	\$176,000
H-5: High-Rise Developments				
(Downtown/Jack London/Broadway Valdez/ parts of Estuary Waterfront)				
Average Monthly Rent (mid-2015)	\$2,700	\$3,700	\$5,200	\$7,200
Annual Housing Rent	\$32,400	\$44,400	\$62,400	\$86,400
Household Income^{/a/}	\$108,000	\$148,000	\$208,000	\$288,000

/a/ Assumes 30% of gross annual household income allocated to rent.

Sources: Vernazza Wolfe Associates Inc. and Hausrath Economics Group

The IMPLAN3 Model that was used to generate household expenditure estimates and associated induced jobs requires input in terms of household income categories or ranges. The average household income results for the Oakland development prototypes are in Tables 4 and 5. These fall into the IMPLAN3 Model income categories as shown in Tables 6 and 7.

Table 6
Household Income Distributions Used in IMPLAN3 Analysis of For-Sale Prototypes

Household Income Level	H-1: Single-Family Detached Homes		H-2: Townhomes/Row Houses	
	A. Urban Infill/ East Oakland primarily	B. North, South, Lower Hills/ Rockridge	A. Urban Infill/West Oakland and parts of North Oakland	B. North Hills, South Hills
	Distribution of Households by Income Level Categories			
Less than \$10,000	0%	0%	0%	0%
\$10,000-\$15,000	0%	0%	0%	0%
\$15,000-\$25,000	0%	0%	0%	0%
\$25,000-\$35,000	0%	0%	0%	0%
\$35,000-\$50,000	0%	0%	0%	0%
\$50,000-\$75,000	0%	0%	0%	0%
\$75,000-\$100,000	100%	0%	0%	0%
\$100,000-\$150,000	0%	0%	100%	0%
Over \$150,000	0%	100%	0%	100%
Total	100%	100%	100%	100%

Sources: Vernazza Wolfe Associates Inc. and Hausrath Economics Group

Table 7
Household Income Distributions Used in IMPLAN3 Analysis of Rental Prototypes

Household Income Level	H-3: Lower/Mid-Rise Apts.	H-4: Mid-Rise Apts.	H-5: High-Rise Apts.
	West Oakland/East Oakland/parts of North Oakland	Downtown/Jack London/Broadway Valdez/parts of North Oakland	Downtown/Jack London/Broadway Valdez/parts of Estuary Waterfront
	Distribution of Households by Income Level Categories		
Less than \$10,000	0%	0%	0%
\$10,000-\$15,000	0%	0%	0%
\$15,000-\$25,000	0%	0%	0%
\$25,000-\$35,000	0%	0%	0%
\$35,000-\$50,000	0%	0%	0%
\$50,000-\$75,000	15%	0%	0%
\$75,000-\$100,000	45%	17%	0%
\$100,000-\$150,000	32%	50%	74%
Over \$150,000	8%	33%	26%
Total	100%	100%	100%

Sources: Vernazza Wolfe Associates Inc. and Hausrath Economics Group

Job Growth, Demand for Affordable Housing, and Maximum Legal Affordable Housing Impact Fees

STEPS 3, 4, and 5: Household Consumer Spending and Job Growth

The growth of household consumer expenditures by new buyer and renter households (based on their household incomes in the prior step) are estimated and translated into induced job growth via the IMPLAN3 input-output model. The model uses economic data specific to Alameda County to estimate the multiplier effects of additional spending and jobs deriving from the demand for goods and local services (including government) that households in the new housing would generate. These multiplier effects are referred to as “induced” growth. The model simultaneously accounts for all purchases and expenditures throughout the county’s economy and is useful in defining economic impacts from exogenous changes, such as growth in expenditures associated with new residential developments.³

A portion of the countywide job growth estimated by the model is allocated to Oakland. According to the Association of Bay Area Governments (ABAG), the City of Oakland currently accounts for 28 percent of the total employment in Alameda County, and this share is projected to remain the same through 2025⁴. Consequently, this nexus study allocates 28 percent of the induced worker impacts (predicted by the IMPLAN3 Model for Alameda County) to the City of Oakland.

STEPS 6 and 7: New Worker Households and Household Incomes

Next, the analysis includes two calculations to convert from additional workers to a focus on worker households so as to be able to consider their housing demand. First, the number of induced jobs in Oakland is converted to the number of new households that they represent by dividing the number of new workers holding the new jobs by the average number of workers per household for Oakland households with workers (1.48 from the U. S. Census Bureau).⁵ Second, worker incomes (based on the IMPLAN3 model analysis) are adjusted to estimate worker household incomes, assuming that the income of other workers in the household is similar to the income of the induced worker.⁶

³ In economics, an input–output model is a quantitative economic technique that represents the interdependencies between different industries and sectors of the economy. Use of the IMPLAN3 Model for this analysis is further described in **Appendix A**, summarizing the IMPLAN methodology, defining induced growth, and presenting tables summarizing the induced employment impacts from development of each new housing prototype.

⁴ ABAG, *Projections 2013* shows that jobs in Oakland account for 28 percent of total employment in Alameda County in both 2015 and 2025.

⁵ The adjustment factor used in this study is 1.48, from the U. S. Census Bureau., 2009-2013 American Community Survey 5-Year Estimate of the number of workers per household for Oakland households with workers. This factor is appropriate for this analysis as it is calculated for households with workers and excludes households without workers.

⁶ It is assumed that the income of other workers is the same as the induced worker in the household, so income results from the IMPLAN3 Model are weighted by 1.48, to reflect the number of workers per household.

STEPS 8 and 9: Demand for Affordable Housing and the Affordability Gap

Some of the new households will require affordable housing, particularly since the increase in jobs is generally in the lower-wage-paying sectors, such as retail sales and services. The distribution of new households among household income categories is used to identify households with demand for affordable housing based on those with incomes in the moderate, low, and very low income categories (using City of Oakland definitions). Since the focus of the nexus study is on increases in the need for affordable housing, new worker households above moderate income are not carried forward into the final calculations.

Separately, analysis is done to calculate the “affordability gap” for households in the different housing affordability categories (moderate-income, low-income, and very low-income).⁷ The affordability gap is defined as the difference between the cost to produce new, modest housing units and what households with very-low, low, and moderate incomes can afford to pay for housing.

STEP 10: Maximum Legal Affordable Housing Impact Fees

Having calculated the affordability gap at different income levels (see above) and having estimated the number of worker households requiring affordable housing, it is possible to calculate the total funds needed to bridge the gap between the costs of developing new affordable housing and what new lower- and moderate-income households can afford to pay.⁸ This total gap figure is calculated for representative housing projects for each market-rate housing prototype. Then the total gap amount for the project is divided by the number of new housing units to identify the average affordability gap per new market-rate unit built. The average affordability gap per unit identifies the maximum fee amount per unit that can be justified on the basis of the nexus calculations.

STEPS 3 – 10: Nexus Calculations for Housing Development Prototypes

The nexus calculations (Steps 3-10) completed for each housing development prototype are presented on the pages that follow. For each prototype, the calculations are done for a representative development project in terms of number of units built (20 to 220 units depending on the prototype). Table 8 on the next page summarizes the job growth and affordable housing impacts that can be linked to new housing development. The bottom row in the table presents the results of the calculations for each housing development prototype, in terms of the **maximum legal housing impact fee per unit** that can be justified by the nexus analysis.

⁷ **Appendix B** defines the Affordability Gap and presents the assumptions and calculations for rental and for-sale housing affordability gaps by household income group.

⁸ The aggregate affordability gap is computed by multiplying the number of households requiring affordable housing in each of three income categories (very low-, low- and moderate-income) by the corresponding gap calculation for each income group. There are no extremely low-income worker households projected by the nexus analysis model.

Table 8
Summary of Job Growth and Affordable Housing Impacts
Linked to New Residential Development

	Single-Family Homes			Townhomes		Multi-Family Apartments		
	Urban H-1A	Hills H-1B	Urban H-2A	Hills H-2B	Lower/Mid-Rise H-3	Mid-Rise H-4	High-Rise H-5	
Number Units in Project	20	100	30	30	120	180	220	
Impacts of Project:								
Job Growth in Oakland	4.77	56.94	9.20	11.13	28.98	49.52	77.05	
Worker Households in Oakland	3.22	38.47	6.22	7.52	19.58	33.46	52.06	
Demand from Very Low-, Low-, and Moderate-Income Worker Households	2.52	29.99	4.87	5.86	15.31	26.15	40.71	
Total Affordability Gap	\$696,653	\$8,172,932	\$1,340,802	\$1,597,744	\$4,220,650	\$7,179,697	\$11,176,967	
Average Affordability Gap per Unit	\$34,833	\$81,729	\$44,693	\$53,258	\$35,172	\$39,887	\$50,804	
Maximum Legal Affordable Housing Impact Fee per Unit	\$34,833	\$81,729	\$44,693	\$53,258	\$35,172	\$39,887	\$50,804	

Note: The numbers shown are not rounded, to retain consistency among the different measures of impacts and consistency with the calculations in Tables 9 through 15.
Source: Tables 9-15

The nexus calculations for each housing development prototype are presented in Tables 9-15 that follow. The calculations in each table show the following:

- Induced job growth in Oakland supported by increases in spending by new residents of new market-rate housing (columns 2, 3, and 5 in the tables).
- New worker households associated with induced job growth, and worker household incomes (columns 4 and 6 in the tables).
- Affordable housing demand from new worker households, by affordability group (columns 7 and 8).
- The funds needed to bridge the affordability gap between the costs of developing new affordable housing and what lower- and moderate-income households can afford to pay (total affordability gap in column 9).
- **Maximum legal affordable housing impact fee per unit** that can be justified by the nexus calculations (column 10).

Table 9
Calculations of Affordability Gap and Maximum Legal Affordable Housing Impact Fees
Prototype H-1A: Single-Family Detached Homes in Urban Infill Locations, East Oakland primarily

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Worker Wage Category	Total Induced Jobs for Project of 20 units/a/	Jobs Accommodated in Oakland/b/	Oakland Worker Households/c/	Average Worker Wages/d/	Worker Household Income/e/	Demand from New Very Low-, Low- and Moderate-income Households	Affordability Group/f/	Total Affordability Gap/g/	Maximum Legal Affordable Housing Impact Fee per Unit/h/
Less than \$10,000	0.00	0	0	n/a	n/a				
\$10,000-\$15,000	0.00	0	0	n/a	n/a				
\$15,000-\$25,000	2.28	0.64	0.43	\$23,778	\$35,191	0.43	Very Low-Income	\$182,233	
\$25,000-\$35,000	1.84	0.52	0.35	\$29,501	\$43,661	0.35	Low-Income	\$132,580	
\$35,000-\$50,000	6.71	1.88	1.27	\$44,218	\$65,442	1.27	Moderate-Income	\$278,673	
\$50,000-\$75,000	2.49	0.70	0.47	\$58,405	\$86,440	0.47	Moderate-Income	\$103,167	
\$75,000-\$100,000	1.20	0.34	0.23	\$87,463	\$129,445				
\$100,000-\$150,000	2.51	0.70	0.48	\$115,656	\$171,171				
Over \$150,000	0.00	0	0	n/a	n/a				
Total	17.03	4.77	3.22	\$55,549	\$82,213	2.52		\$696,653	\$34,833

Assumptions:

- 20** number of units in development project for prototype H-1A
- 28%** percent of Alameda County jobs located in Oakland (current and projected by ABAG Projections 2013)
- 1.48** number of wage earners per household with workers in Oakland (2009 - 2013 American Community Survey, 5-Year Estimates, U.S. Census Bureau)

Notes:

- /a/ Results of IMPLAN3 input-output model. Project assumes development of 20 units of prototype H-1A.
- /b/ Total induced jobs multiplied by the percent of Alameda County jobs located in Oakland.
- /c/ Jobs in Oakland divided by wage earners per household with workers.
- /d/ Results of IMPLAN3 input-output model and analysis of data from the California Labor Market Information Division. (See Appendix A.)
- /e/ Average worker income multiplied by the number of wage earners in households with workers.
- /f/ Demand from Oakland households (earlier column) with incomes in the moderate, low, and very-low income categories based on City of Oakland household income threshold incomes for an average size household of 2.5 persons: Very Low Income (\$39,525), Low Income (\$63,580), and Moderate Income (\$95,370).
- /g/ Number of households multiplied the by average affordability gap for applicable income group. (See Appendix B for background on the affordability gap analysis and calculations.)
- /h/ Total affordability gap divided by number of new units in the project (20 units for prototype H-1A).

Source: Vernazza Wolfe Associates, Inc. and ADE, Inc.

Table 10
Calculations of Affordability Gap and Maximum Legal Affordable Housing Impact Fees
Prototype H-1B: Single-Family Detached Homes in North/South/Lower Hills and Rockridge

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Worker Wage Category	Total Induced Jobs for Project of 100 units/a/	Jobs Accommodated in Oakland/b/	Oakland Worker Households/c/	Average Worker Wages/d/	Worker Household Income/e/	Demand from New Very Low-, Low- and Moderate-income Households	Affordability Group/f/	Total Affordability Gap/g/	Maximum Legal Affordable Housing Impact Fee per Unit/h/
Less than \$10,000	0.00	0	0	n/a	n/a				
\$10,000-\$15,000	0.00	0	0	n/a	n/a				
\$15,000-\$25,000	24.60	6.89	4.65	\$23,778	\$35,191	4.65	Very Low-Income	\$1,968,197	
\$25,000-\$35,000	21.17	5.93	4.00	\$29,551	\$43,736	4.00	Low-Income	\$1,523,885	
\$35,000-\$50,000	80.05	22.41	15.14	\$44,246	\$65,485	15.14	Moderate-Income	\$3,322,789	
\$50,000-\$75,000	32.72	9.16	6.19	\$58,545	\$86,647	6.19	Moderate-Income	\$1,358,061	
\$75,000-\$100,000	15.68	4.39	2.97	\$87,643	\$129,711				
\$100,000-\$150,000	29.13	8.16	5.51	\$115,861	\$171,474				
Over \$150,000	0.00	0	0	n/a	n/a				
Total	203.34	56.94	38.47	\$56,147	\$83,098	29.99		\$8,172,932	\$81,729

Assumptions:

- 100** number of units in development project for prototype H-1B
- 28%** percent of Alameda County jobs located in Oakland (current and projected by ABAG *Projections 2013*)
- 1.48** number of wage earners per household with workers in Oakland (2009 - 2013 American Community Survey, 5-Year Estimates, U.S. Census Bureau)

Notes:

- /a/ Results of IMPLAN3 input-output model. Project assumes development of 100 units of prototype H-1B.
- /b/ Total induced jobs multiplied by the percent of Alameda County jobs located in Oakland.
- /c/ Jobs in Oakland divided by wage earners per household with workers.
- /d/ Results of IMPLAN3 input-output model and analysis of data from the California Labor Market Information Division. (See Appendix A.)
- /e/ Average worker income multiplied by the number of wage earners in households with workers.
- /f/ Demand from Oakland households (earlier column) with incomes in the moderate, low, and very-low income categories based on City of Oakland household income threshold incomes for an average size household of 2.5 persons: Very Low Income (\$39,525), Low Income (\$63,580), and Moderate Income (\$95,370).
- /g/ Number of households multiplied by the average affordability gap for applicable income group. (See Appendix B for background on the affordability gap analysis and calculations.)
- /h/ Total affordability gap divided by number of new units in the project (100 units for prototype H-1B).

Source: Vernazza Wolfe Associates, Inc. and ADE, Inc.

Table 11
Calculations of Affordability Gap and Maximum Legal Affordable Housing Impact Fees
Prototype H-2A: Townhomes/Row Houses in Urban Infill, West Oakland, and parts of North Oakland

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Worker Wage Category	Total Induced Jobs for Project of 30 units/a/	Jobs Accommodated in Oakland/b/	Oakland Worker Households/c/	Average Worker Wages/d/	Worker Household Income/e/	Demand from New Very Low-, Low- and Moderate-income Households	Affordability Group/f/	Total Affordability Gap/g/	Maximum Legal Affordable Housing Impact Fee per Unit/h/
Less than \$10,000	0.00	0	0	n/a	n/a				
\$10,000-\$15,000	0.00	0	0	n/a	n/a				
\$15,000-\$25,000	4.31	1.21	0.82	\$23,778	\$35,191	0.82	Very Low-Income	\$344,968	
\$25,000-\$35,000	3.51	0.98	0.66	\$29,499	\$43,659	0.66	Low-Income	\$252,663	
\$35,000-\$50,000	13.03	3.65	2.47	\$44,237	\$65,471	2.47	Moderate-Income	\$541,004	
\$50,000-\$75,000	4.87	1.36	0.92	\$58,451	\$86,507	0.92	Moderate-Income	\$202,167	
\$75,000-\$100,000	2.35	0.66	0.44	\$87,482	\$129,473				
\$100,000-\$150,000	4.78	1.34	0.90	\$115,662	\$171,180				
Over \$150,000	0.00	0.00	0	n/a	n/a				
Total	32.86	9.20	6.22	\$55,575	\$82,251	4.87		\$1,340,802	\$44,693

Assumptions:

- 30** number of units in development project of prototype H-2A
- 28%** percent of Alameda County jobs located in Oakland (current and projected by ABAG Projections 2013)
- 1.48** number of wage earners per household with workers in Oakland (2009 - 2013 American Community Survey, 5-Year Estimates, U.S. Census Bureau)

Notes:

- /a/ Results of IMPLAN3 input-output model. Project assumes development of 30 units of prototype H-2A.
- /b/ Total induced jobs multiplied by the percent of Alameda County jobs located in Oakland.
- /c/ Jobs in Oakland divided by wage earners per household with workers.
- /d/ Results of IMPLAN3 input-output model and analysis of data from the California Labor Market Information Division. (See Appendix A.)
- /e/ Average worker income multiplied by the number of wage earners in households with workers.
- /f/ Demand from Oakland households (earlier column) with incomes in the moderate, low, and very-low income categories based on City of Oakland household income threshold incomes for an average size household of 2.5 persons: Very Low Income (\$39,525), Low Income (\$63,580), and Moderate Income (\$95,370).
- /g/ Number of households multiplied the by average affordability gap for applicable income group. (See Appendix B for background on the affordability gap analysis and calculations.)
- /h/ Total affordability gap divided by number of new units in the project (30 units for prototype H-2A).

Source: Vernazza Wolfe Associates, Inc. and ADE, Inc.

Table 12
Calculations of Affordability Gap and Maximum Legal Affordable Housing Impact Fees
Prototype H-2B: Townhomes/Row Houses in North Hills/South Hills

(1) Worker Wage Category	(2) Total Induced Jobs for Project of 30 units/a/	(3) Jobs Accommodated in Oakland/b/	(4) Oakland Worker Households/c/	(5) Average Worker Wages/d/	(6) Worker Household Income/e/	(7) Demand from New Very Low-, Low- and Moderate-income Households	(8) Affordability Group/f/	(9) Total Affordability Gap/g/	(10) Maximum Legal Affordable Housing Impact Fee per Unit/h/
Less than \$10,000	0.00	0	0	n/a	n/a				
\$10,000-\$15,000	0.00	0	0	n/a	n/a				
\$15,000-\$25,000	4.81	1.35	0.91	\$23,778	\$35,191	0.91	Very Low-Income	\$384,767	
\$25,000-\$35,000	4.14	1.16	0.78	\$29,551	\$43,736	0.78	Low-Income	\$297,908	
\$35,000-\$50,000	15.65	4.38	2.96	\$44,246	\$65,485	2.96	Moderate-Income	\$649,579	
\$50,000-\$75,000	6.40	1.79	1.21	\$58,545	\$86,647	1.21	Moderate-Income	\$265,490	
\$75,000-\$100,000	3.06	0.86	0.58	\$87,643	\$129,711				
\$100,000-\$150,000	5.70	1.59	1.08	\$115,861	\$171,474				
Over \$150,000	0.00	0.00	0	n/a	n/a				
Total	39.75	11.13	7.52	\$56,147	\$83,098	5.86		\$1,597,744	\$53,258

Assumptions:

- 30** number of units in development projects of prototype H-2B
- 28%** percent of Alameda County jobs located in Oakland (current and projected by ABAG Projections 2013)
- 1.48** number of wage earners per household with workers in Oakland (2009 - 2013 American Community Survey, 5-Year Estimates, U.S. Census Bureau)

Notes:

- /a/ Results of IMPLAN3 input-output model. Project assumes development of 30 units of prototype H-2B.
- /b/ Total induced jobs multiplied by the percent of Alameda County jobs located in Oakland.
- /c/ Jobs in Oakland divided by wage earners per household with workers.
- /d/ Results of IMPLAN3 input-output model and analysis of data from the California Labor Market Information Division. (See Appendix A.)
- /e/ Average worker income multiplied by the number of wage earners in households with workers.
- /f/ Demand from Oakland households (earlier column) with incomes in the moderate, low, and very-low income categories based on City of Oakland household income threshold incomes for an average size household of 2.5 persons: Very Low Income (\$39,525), Low Income (\$63,580), and Moderate Income (\$95,370).
- /g/ Number of households multiplied the by average affordability gap for applicable income group. (See Appendix B for background on the affordability gap analysis and calculations.)
- /h/ Total affordability gap divided by number of new units in the project (30 units for prototype H-2B).

Source: Vernazza Wolfe Associates, Inc. and ADE, Inc.

Table 13
Calculations of Affordability Gap and Maximum Legal Affordable Housing Impact Fees
Prototype H-3: Lower and Mid-Rise Rental Apartments in West Oakland, East Oakland, and Parts of North Oakland

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Worker Wage Category	Total Induced Jobs for Project of 120 units/a/	Jobs Accommodated in Oakland/b/	Oakland Worker Households/c/	Average Worker Wages/d/	Worker Household Income/e/	Demand from New Very Low-, Low- and Moderate-income Households	Affordability Group/f/	Total Affordability Gap/g/	Maximum Legal Affordable Housing Impact Fee per Unit/h/
Less than \$10,000	0	0	0	n/a	n/a				
\$10,000-\$15,000	0	0	0	n/a	n/a				
\$15,000-\$25,000	13.56	3.80	2.57	\$23,778	\$35,191	2.57	Very Low-Income	\$1,085,142	
\$25,000-\$35,000	11.11	3.11	2.10	\$29,506	\$43,668	2.10	Low-Income	\$799,723	
\$35,000-\$50,000	40.93	11.46	7.74	\$44,229	\$65,459	7.74	Moderate-Income	\$1,699,195	
\$50,000-\$75,000	15.34	4.29	2.90	\$58,434	\$86,482	2.90	Moderate-Income	\$636,590	
\$75,000-\$100,000	7.40	2.07	1.40	\$87,486	\$129,479				
\$100,000-\$150,000	15.16	4.24	2.87	\$115,683	\$171,211				
Over \$150,000	0	0	0	n/a	n/a				
Total	103.50	28.98	19.58	\$55,631	\$82,334	15.31		\$4,220,650	\$35,172

Assumptions:

- 120** number of units in development project for prototype H-3
- 28%** percent of Alameda County jobs located in Oakland (current and projected by ABAG *Projections 2013*)
- 1.48** number of wage earners per household with workers in Oakland (2009 - 2013 American Community Survey, 5-Year Estimates, U.S. Census Bureau)

Notes:

- /a/ Results of IMPLAN3 input-output model. Project assumes development of 120 units of prototype H-3.
- /b/ Total induced jobs multiplied by the percent of Alameda County jobs located in Oakland.
- /c/ Jobs in Oakland divided by wage earners per household with workers.
- /d/ Results of IMPLAN3 input-output model and analysis of data from the California Labor Market Information Division. (See Appendix A.)
- /e/ Average worker income multiplied by the number of wage earners in households with workers.
- /f/ Demand from Oakland households (earlier column) with incomes in the moderate, low, and very-low income categories based on City of Oakland household income threshold incomes for an average size household of 2.5 persons: Very Low Income (\$39,525), Low Income (\$63,580), and Moderate Income (\$95,370).
- /g/ Number of households multiplied by the average affordability gap for applicable income group. (See Appendix B for background on the affordability gap analysis and calculations.)
- /h/ Total affordability gap divided by number of new units in the project (120 units for prototype H-3).

Source: Vernazza Wolfe Associates, Inc. and ADE, Inc.

Table 14
Calculations of Affordability Gap and Maximum Legal Affordable Housing Impact Fees
Prototype H-4: Mid-Rise Rental Apartments in Downtown/Jack London/Broadway Valdez/and parts of North Oakland

(1) Worker Wage Category	(2) Total Induced Jobs for Project of 180 units/a/	(3) Jobs Accommodated in Oakland/b/	(4) Oakland Worker Households/c/	(5) Average Worker Wages/d/	(6) Worker Household Income/e/	(7) Demand from New Very Low-, Low- and Moderate-income Households	(8) Affordability Group/f/	(9) Total Affordability Gap/g/	(10) Maximum Legal Affordable Housing Impact Fee per Unit/h/
Less than \$10,000	0	0	n/a	\$0	\$0				
\$10,000-\$15,000	0	0	n/a	\$0	\$0				
\$15,000-\$25,000	22.60	6.33	4.28	\$23,778	\$35,191	4.28	Very Low-Income	\$1,808,313	
\$25,000-\$35,000	18.75	5.25	3.55	\$29,518	\$43,687	3.55	Low-Income	\$1,349,672	
\$35,000-\$50,000	69.90	19.57	13.22	\$44,238	\$65,472	13.22	Moderate-Income	\$2,901,407	
\$50,000-\$75,000	26.99	7.56	5.11	\$58,481	\$86,552	5.11	Moderate-Income	\$1,120,304	
\$75,000-\$100,000	12.99	3.64	2.46	\$87,542	\$129,562				
\$100,000-\$150,000	25.64	7.18	4.85	\$115,734	\$171,287				
Over \$150,000	0	0	0	n/a	n/a				
Total	176.87	49.52	33.46	\$55,783	\$82,259	26.15		\$7,179,696	\$39,887

Assumptions:

- 180** number of units in development project for prototype H-4.
- 28%** percent of Alameda County jobs located in Oakland (current and projected by ABAG Projections 2013)
- 1.48** number of wage earners per household with workers in Oakland (2009 - 2013 American Community Survey, 5-Year Estimates, U.S. Census Bureau)

Notes:

- /a/ Results of IMPLAN3 input-output model. Project assumes development of 180 units of prototype H-4.
- /b/ Total induced jobs multiplied by the percent of Alameda County jobs located in Oakland.
- /c/ Jobs in Oakland divided by wage earners per household with workers.
- /d/ Results of IMPLAN3 input-output model and analysis of data from the California Labor Market Information Division. (See Appendix A.)
- /e/ Average worker income multiplied by the number of wage earners in households with workers.
- /f/ Demand from Oakland households (earlier column) with incomes in the moderate, low, and very-low income categories based on City of Oakland household income threshold incomes for an average size household of 2.5 persons: Very Low Income (\$39,525), Low Income (\$63,580), and Moderate Income (\$95,370).
- /g/ Number of households multiplied by the average affordability gap for applicable income group. (See Appendix B for background on the affordability gap analysis and calculations.)
- /h/ Total affordability gap divided by number of new units in the project (180 units for prototype H-4).

Source: Vernazza Wolfe Associates, Inc. and ADE, Inc.

Table 15
Calculations of Affordability Gap and Maximum Legal Affordable Housing Impact Fees
Prototype H-5: High-rise Rental Apartments on Prime Sites in Downtown/Jack London/Broadway Valdez/parts of Estuary Waterfront

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Worker Wage Category	Total Induced Jobs for Project of 220 units/a/	Jobs Accommodated in Oakland/b/	Oakland Worker Households/c/	Average Worker Wages/d/	Worker Household Income/e/	Demand from New Very Low-, Low- and Moderate-income Households	Affordability Group/f/	Total Affordability Gap/g/	Maximum Legal Affordable Housing Impact Fee per Unit/h/
Less than \$10,000	0	0	n/a	\$0	\$0				
\$10,000-\$15,000	0	0	n/a	\$0	\$0				
\$15,000-\$25,000	35.24	9.87	6.67	\$23,778	\$35,191	6.67	Very Low-Income	\$2,819,597	
\$25,000-\$35,000	29.16	8.17	5.52	\$29,515	\$43,682	5.52	Low-Income	\$2,099,444	
\$35,000-\$50,000	108.90	30.49	20.60	\$44,240	\$65,475	20.60	Moderate-Income	\$4,520,272	
\$50,000-\$75,000	41.86	11.72	7.92	\$58,481	\$86,552	7.92	Moderate-Income	\$1,737,654	
\$75,000-\$100,000	20.15	5.64	3.81	\$87,534	\$129,550				
\$100,000-\$150,000	39.86	11.16	7.54	\$115,723	\$171,270				
Over \$150,000	0	0	0	n/a	n/a				
Total	275.18	77.05	52.06	\$55,751	\$82,511	40.71		\$11,176,967	\$50,804

Assumptions:

- 220** number of units in development project for prototype H-5.
- 28%** percent of Alameda County jobs located in Oakland (current and projected by ABAG Projections 2013)
- 1.48** number of wage earners per household with workers in Oakland (2009 - 2013 American Community Survey, 5-Year Estimates, U.S. Census Bureau)

Notes:

- /a/ Results of IMPLAN3 input-output model. Project assumes development of 220 units of prototype H-5.
- /b/ Total induced jobs multiplied by the percent of Alameda County jobs located in Oakland.
- /c/ Jobs in Oakland divided by wage earners per household with workers.
- /d/ Results of IMPLAN3 input-output model and analysis of data from the California Labor Market Information Division. (See Appendix A.)
- /e/ Average worker income multiplied by the number of wage earners in households with workers.
- /f/ Demand from Oakland households (earlier column) with incomes in the moderate, low, and very-low income categories based on City of Oakland household income threshold incomes for an average size household of 2.5 persons: Very Low Income (\$39,525), Low Income (\$63,580), and Moderate Income (\$95,370).
- /g/ Number of households multiplied the by average affordability gap for applicable income group. (See Appendix B for background on the affordability gap analysis and calculations.)
- /h/ Total affordability gap divided by number of new units in the project (220 units for prototype H-5).

Source: Vernazza Wolfe Associates, Inc. and ADE, Inc.

IMPACT FEE PROGRAM AND POLICY CONSIDERATIONS

The results of the nexus analysis identify the maximum legal affordable housing impact fees that could be charged on new market-rate housing development in Oakland. Based on the nexus analysis, the City Council can adopt affordable housing impact fees at or below the maximum legal fee amounts identified.

After reviewing the results of nexus analyses and considering the broad range of local policy goals, decision-makers can adopt fees up to the maximum justified in the nexus analysis. Economic feasibility considerations typically result in adopted fees at levels below the maximum legal amounts to avoid affecting the amount and pace of new housing development. To support development of housing for all income levels, impact fee proposals seek to balance the need for more affordable housing with not impeding the construction of new market-rate housing.

Economic Feasibility Considerations

As another component of the City's Impact Fee Study, the Consultant Team analyzed the economic feasibility of new development in Oakland. The analysis provides a basis for creating an impact fee program that can be implemented without adversely affecting Oakland's ability to attract new development. The representative housing development prototypes analyzed in this nexus analysis are the same as those analyzed in the economic feasibility analysis. The economic feasibility analysis is presented in a separate report: *Economic Feasibility Study for Oakland Impact Fee Program*.

Consideration of Transportation and Capital Facilities Impact Fees in Addition to Affordable Housing Impact Fees

In addition to the adoption of affordable housing impact fees, Oakland also is considering new impact fees for transportation and capital facilities. It is important that the impacts on development feasibility of affordable housing fee options be considered in combination with the magnitudes of other proposed impact fees also under consideration.

Fee Revenue Deposited in Affordable Housing Trust Fund

Revenue from affordable housing impact fees would be deposited into the City's Affordable Housing Trust Fund. The Trust Fund also collects funds from other sources such as the existing Jobs-Housing Impact Fee and the 25 percent allocation of former redevelopment tax increment funds set aside for affordable housing (i.e., "boomerang funds"). Through the Affordable Housing Trust Fund, the City provides funding for affordable housing. Through the Trust Fund, fee revenue can be leveraged by a factor of more than 3:1 to produce more affordable units.

On-Site Affordable Housing Option Possible

As an alternative to payment of affordable housing impact fees, development projects could be allowed to provide affordable units on-site as a part of the market-rate development. If an on-site option is adopted, the City should establish a policy that specifies the number or share of affordable units and the income targeted for those units.

Comparing the options of (a) payment of an impact fee or (b) development of affordable units on-site, there are advantages of each approach to consider.

- ◆ Advantages of payment of impact fees to fund affordable housing:
 - May produce more total funding for affordable housing by leveraging local housing trust funds to attract outside funding sources.
 - Can serve lower income groups as on-site affordable housing is generally targeted to higher income groups.
 - On-site services to residents are often provided in affordable housing developments (such as computer training, after school programs, etc.).
- ◆ Advantages of on-site development of affordable housing in market-rate projects:
 - Affordable housing is built along with market-rate housing and may be available more quickly.
 - May provide access to more neighborhoods, possibly those with more amenities and better public services.

Affordable Housing Impact Fees As Part of Broader Housing Equity Strategy and Initiatives in Oakland

Adoption of affordable housing impact fees on residential development is one of a number of initiatives and new strategies underway to support affordable housing production and address a range of housing affordability needs in Oakland. In 2015, the City developed the *Oakland Housing Equity Roadmap* to provide a comprehensive action plan and policy framework for addressing Oakland's housing crisis. The Action Plan provides detailed strategies targeted to build new affordable housing, prevent displacement of long-time residents, and improve housing habitability and health while maintaining housing affordability. Adoption of a financially feasible housing impact fee program to increase revenues for building new affordable housing is one of the strategies recommended.

ADMINISTRATIVE ISSUES

The City is advised to adjust the affordable housing impact fees annually. An adjustment mechanism updates the fees to compensate for changes in development costs. Routinely published cost indices are used for these annual adjustments. This adjustment would likely start after the three year phase-in, and the target fee is reached.

The construction cost index or building cost index published in the Engineering News Record (ENR) are the most widely used to update other types of impact fees. The indices measure changes in building material and labor costs (skilled labor for the building cost index and unskilled labor for the construction cost index). ENR publishes a San Francisco cost index, a California cost index, and a national 20-city average index.

In addition to revising the fee annually for inflation, the City is encouraged to update the housing impact nexus study every five years, or at the very least, update the housing affordability gap used in the basic model. The purpose of these updates is to ensure that the fee is still based on a cost-revenue structure that remains applicable to the Oakland housing market. In this way, the fee will more accurately reflect any potential structural changes in the relationships between affordable prices and rents, market-rate prices and rents, and development costs.

APPENDIX A

IMPLAN METHODOLOGY AND INDUCED JOBS AND WAGES

MULTIPLIER IMPACT ANALYSIS METHODOLOGY OVERVIEW

The multiplier analysis to identify induced jobs and wages was done using the IMPLAN3 Model. The IMPLAN model is an economic data set that has been used for over 35 years to measure the economic impacts of new investments and spending using the industrial relationships defined through an Input-Output Model. The IMPLAN model can estimate economic impacts resulting from changes in industry output, employment, income, and other measures. The latest version of this model is referred to as IMPLAN3. For this study, the IMPLAN3 Model's calculations are based on increases in household incomes as a result of new housing development. Before estimating the growth of consumer expenditures by new residents, the model adjusts gross income to account for the payment of income taxes and for savings.

The input/output analysis using the IMPLAN3 Model was conducted by Applied Development Economics (ADE), a Bay Area economics consulting firm, for Vernazza Wolfe Associates. ADE conducted two separate analyses. The first analysis estimated the household demand for retail goods and personal services that would be generated by the growth of households facilitated by development of new market-rate housing. This demand is based on the projected incomes of the new buyers and renters. The second analysis estimated the multiplier effects that this new household demand would create in terms of employment and labor income.

For this analysis, the input-output model used data specific to Alameda County in order to estimate the multiplier effects resulting from the households that rent or buy new housing units in Oakland. In this case, the multiplier effects derive from new demand for goods and local services (including government) that new households would generate within Alameda County. It does not account for economic impacts generated during the construction period, or any economic impacts that would occur outside of the county.

The economic impacts estimated for this study by the model fall into two categories - direct and induced impacts. For this analysis, the direct impacts represent the household income brought into the community by new residents. The Induced impacts represent the potential effects resulting from household spending at local establishments by the new workers hired as a result of increased household expenditures. These impacts affect all sectors of the economy, but primarily affect retail businesses, health services, personal services providers, and government services. The employment estimates provided by the IMPLAN3 Model cover all types of jobs, including full- and part-time jobs.⁹

⁹ Because the direct impacts come from household spending, and not from business activity and the demand for commodities and services from suppliers to business operations, the indirect effects were not calculated for this study.

Analysis to Estimate Household Demand and Increased Consumer Expenditures

The first analysis undertaken by the IMPLAN3 Model estimated the household demand for retail goods and personal services. It is assumed that buyers and renters of new housing units in Oakland increase demand for goods and services within Alameda County. This demand is based on the projected incomes of renters and owners for each prototype. The IMPLAN3 Model's calculations are based on changes in household income, which adjusts the gross income to account for the payment of income taxes and savings.

Analysis to Estimate Multiplier Effects from New Household Demand

The second step in the analysis is to estimate the induced impacts, or multiplier effects of new household spending in terms of jobs and wage income. The jobs and income calculations are focused on the induced jobs that would be created through local spending by the new households. The input-output model estimates the job impacts by detailed industry sector. Then, the analysis took the detailed industry impact estimates and distributed them by occupational category. The occupational employment data used in the analysis came from the California Employment Development Department (EDD) Labor Market Information Division.

Occupational Analysis

After converting the industry level employment data into employment by occupation, the income distribution of new workers was calculated using the occupational wage data for the Oakland-Fremont-Hayward Metropolitan Division that includes Alameda and Contra Costa Counties. The average wage by occupation was used to make this calculation. The 2015 (first quarter) occupational wage data used in the analysis comes from California's EDD.

SUMMARY TABLES OF INDUCED EMPLOYMENT IMPACTS

Tables A-1 through A-7 summarize the induced employment impacts for development projects for each of the housing development prototypes. The tables identify the total number of induced jobs and the number of jobs and mean annual wages per job by occupation.

Table A-1
Summary of Induced Employment Impacts by Occupation
Prototype H-1A:Single-Family Detached Homes in Urban Infill Locations (East Oakland, primarily)

SOC Code	Occupational Title	Mean Annual Wage	Induced Jobs
	Total all occupations		17.03
11-0000	Management Occupations	\$132,921	0.86
13-0000	Business and Financial Operations Occupations	\$85,001	0.89
15-0000	Computer and Mathematical Occupations	\$102,401	0.34
17-0000	Architecture and Engineering Occupations	\$99,815	0.17
19-0000	Life, Physical, and Social Science Occupations	\$88,094	0.15
21-0000	Community and Social Services Occupations	\$55,951	0.39
23-0000	Legal Occupations	\$112,338	0.12
25-0000	Education, Training, and Library Occupations	\$60,666	0.52
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	\$59,672	0.28
29-0000	Healthcare Practitioners and Technical Occupations	\$107,400	1.20
31-0000	Healthcare Support Occupations	\$39,944	0.58
33-0000	Protective Service Occupations	\$57,796	0.42
35-0000	Food Preparation and Serving-Related Occupations	\$23,778	2.28
37-0000	Building and Grounds Cleaning and Maintenance Occupations	\$33,118	0.56
39-0000	Personal Care and Service Occupations	\$27,917	1.27
41-0000	Sales and Related Occupations	\$46,670	2.09
43-0000	Office and Administrative Support Occupations	\$44,134	2.76
45-0000	Farming, Fishing, and Forestry Occupations	\$28,395	0.02
47-0000	Construction and Extraction Occupations	\$62,313	0.28
49-0000	Installation, Maintenance, and Repair Occupations	\$56,039	0.60
51-0000	Production Occupations	\$41,629	0.34
53-0000	Transportation and Material Moving Occupations	\$42,568	0.94

Note: The calculations assume a development project of prototype H-1A with 20 units.

Source: ADE, Inc., data from IMPLAN3 input-output model and California Labor Market Information Division.

Table A-2
Summary of Induced Employment Impacts by Occupation
Prototype H-1B: Single-Family Homes in North/South/Lower Hills and Rockridge

SOC Code	Occupational Title	Mean Annual Wage	Induced Jobs
	Total all occupations		203.34
11-0000	Management Occupations	\$132,921	10.20
13-0000	Business and Financial Operations Occupations	\$85,001	11.27
15-0000	Computer and Mathematical Occupations	\$102,401	4.33
17-0000	Architecture and Engineering Occupations	\$99,815	2.37
19-0000	Life, Physical, and Social Science Occupations	\$88,094	2.03
21-0000	Community and Social Services Occupations	\$55,951	4.65
23-0000	Legal Occupations	\$112,338	1.61
25-0000	Education, Training, and Library Occupations	\$60,666	7.71
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	\$59,672	3.32
29-0000	Healthcare Practitioners and Technical Occupations	\$107,400	13.00
31-0000	Healthcare Support Occupations	\$39,944	6.11
33-0000	Protective Service Occupations	\$57,796	6.06
35-0000	Food Preparation and Serving-Related Occupations	\$23,778	24.60
37-0000	Building and Grounds Cleaning and Maintenance Occupations	\$33,118	6.63
39-0000	Personal Care and Service Occupations	\$27,917	14.33
41-0000	Sales and Related Occupations	\$46,670	24.78
43-0000	Office and Administrative Support Occupations	\$44,134	33.57
45-0000	Farming, Fishing, and Forestry Occupations	\$28,395	0.20
47-0000	Construction and Extraction Occupations	\$62,313	3.82
49-0000	Installation, Maintenance, and Repair Occupations	\$56,039	7.15
51-0000	Production Occupations	\$41,629	4.07
53-0000	Transportation and Material Moving Occupations	\$42,568	11.51

Note: The calculations assume a development project of prototype H-1B with 100 units
Source: ADE, Inc., data from IMPLAN3 input-output model and California Labor Market Information Division.

Table A-3
Summary of Induced Employment Impacts by Occupation
Prototype H-2A: Townhomes/Row Houses
In Urban Infill Locations (West Oakland and Parts of North Oakland)

SOC Code	Occupational Title	Mean Annual Wage	Induced Jobs
	Total all occupations		32.86
11-0000	Management Occupations	\$132,921	1.63
13-0000	Business and Financial Operations Occupations	\$85,001	1.73
15-0000	Computer and Mathematical Occupations	\$102,401	0.66
17-0000	Architecture and Engineering Occupations	\$99,815	0.33
19-0000	Life, Physical, and Social Science Occupations	\$88,094	0.29
21-0000	Community and Social Services Occupations	\$55,951	0.74
23-0000	Legal Occupations	\$112,338	0.23
25-0000	Education, Training, and Library Occupations	\$60,666	1.08
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	\$59,672	0.53
29-0000	Healthcare Practitioners and Technical Occupations	\$107,400	2.26
31-0000	Healthcare Support Occupations	\$39,944	1.08
33-0000	Protective Service Occupations	\$57,796	0.83
35-0000	Food Preparation and Serving-Related Occupations	\$23,778	4.31
37-0000	Building and Grounds Cleaning and Maintenance Occupations	\$33,118	1.06
39-0000	Personal Care and Service Occupations	\$27,917	2.41
41-0000	Sales and Related Occupations	\$46,670	4.10
43-0000	Office and Administrative Support Occupations	\$44,134	5.35
45-0000	Farming, Fishing, and Forestry Occupations	\$28,395	0.03
47-0000	Construction and Extraction Occupations	\$62,313	0.54
49-0000	Installation, Maintenance, and Repair Occupations	\$56,039	1.14
51-0000	Production Occupations	\$41,629	0.66
53-0000	Transportation and Material Moving Occupations	\$42,568	1.84

Note: The calculations assume a development project of prototype H-2A with 30 units.

Source: ADE, Inc., data from IMPLAN3 input-output model and California Labor Market Information Division.

Table A-4
Summary of Induced Employment Impacts by Occupation
Prototype H-2B: Townhomes/Row Houses in North Hills/South Hills

SOC Code	Occupational Title	Mean Annual Wage	Induced Jobs
	Total all occupations		39.75
11-0000	Management Occupations	\$132,921	1.99
13-0000	Business and Financial Operations Occupations	\$85,001	2.20
15-0000	Computer and Mathematical Occupations	\$102,401	0.85
17-0000	Architecture and Engineering Occupations	\$99,815	0.46
19-0000	Life, Physical, and Social Science Occupations	\$88,094	0.40
21-0000	Community and Social Services Occupations	\$55,951	0.91
23-0000	Legal Occupations	\$112,338	0.31
25-0000	Education, Training, and Library Occupations	\$60,666	1.51
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	\$59,672	0.65
29-0000	Healthcare Practitioners and Technical Occupations	\$107,400	2.54
31-0000	Healthcare Support Occupations	\$39,944	1.19
33-0000	Protective Service Occupations	\$57,796	1.19
35-0000	Food Preparation and Serving-Related Occupations	\$23,778	4.81
37-0000	Building and Grounds Cleaning and Maintenance Occupations	\$33,118	1.30
39-0000	Personal Care and Service Occupations	\$27,917	2.80
41-0000	Sales and Related Occupations	\$46,670	4.84
43-0000	Office and Administrative Support Occupations	\$44,134	6.56
45-0000	Farming, Fishing, and Forestry Occupations	\$28,395	0.04
47-0000	Construction and Extraction Occupations	\$62,313	0.75
49-0000	Installation, Maintenance, and Repair Occupations	\$56,039	1.40
51-0000	Production Occupations	\$41,629	0.80
53-0000	Transportation and Material Moving Occupations	\$42,568	2.25

Note: The calculations assume a development project of prototype H-2B with 30 units.

Source: ADE, Inc., data from IMPLAN3 input-output model and California Labor Market Information Division.

Table A-5
Summary of Induced Employment Impacts by Occupation
Prototype H-3: Lower and Mid-Rise Rental Apartments
West Oakland, East Oakland, and Parts of North Oakland

SOC Code	Occupational Title	Mean Annual Wage	Induced Jobs
	Total all occupations		39.75
11-0000	Management Occupations	\$132,921	1.99
13-0000	Business and Financial Operations Occupations	\$85,001	2.20
15-0000	Computer and Mathematical Occupations	\$102,401	0.85
17-0000	Architecture and Engineering Occupations	\$99,815	0.46
19-0000	Life, Physical, and Social Science Occupations	\$88,094	0.40
21-0000	Community and Social Services Occupations	\$55,951	0.91
23-0000	Legal Occupations	\$112,338	0.31
25-0000	Education, Training, and Library Occupations	\$60,666	1.51
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	\$59,672	0.65
29-0000	Healthcare Practitioners and Technical Occupations	\$107,400	2.54
31-0000	Healthcare Support Occupations	\$39,944	1.19
33-0000	Protective Service Occupations	\$57,796	1.19
35-0000	Food Preparation and Serving-Related Occupations	\$23,778	4.81
37-0000	Building and Grounds Cleaning and Maintenance Occupations	\$33,118	1.30
39-0000	Personal Care and Service Occupations	\$27,917	2.80
41-0000	Sales and Related Occupations	\$46,670	4.84
43-0000	Office and Administrative Support Occupations	\$44,134	6.56
45-0000	Farming, Fishing, and Forestry Occupations	\$28,395	0.04
47-0000	Construction and Extraction Occupations	\$62,313	0.75
49-0000	Installation, Maintenance, and Repair Occupations	\$56,039	1.40
51-0000	Production Occupations	\$41,629	0.80
53-0000	Transportation and Material Moving Occupations	\$42,568	2.25

Note: The calculations assume a development project of prototype H-3 with 120 units.

Source: ADE, Inc., data from IMPLAN3 input-output model and California Labor Market Information Division.

Table A-6
Summary of Induced Employment Impacts by Occupation
Prototype H-4: Mid-Rise Rental Apartments
Downtown, Jack London, Broadway-Valdez, and Parts of North Oakland

SOC Code	Occupational Title	Mean Annual Wage	Induced Jobs
	Total all occupations		176.87
11-0000	Management Occupations	\$132,921	8.84
13-0000	Business and Financial Operations Occupations	\$85,001	9.47
15-0000	Computer and Mathematical Occupations	\$102,401	3.62
17-0000	Architecture and Engineering Occupations	\$99,815	1.89
19-0000	Life, Physical, and Social Science Occupations	\$88,094	1.63
21-0000	Community and Social Services Occupations	\$55,951	4.01
23-0000	Legal Occupations	\$112,338	1.28
25-0000	Education, Training, and Library Occupations	\$60,666	6.10
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	\$59,672	2.87
29-0000	Healthcare Practitioners and Technical Occupations	\$107,400	11.90
31-0000	Healthcare Support Occupations	\$39,944	5.66
33-0000	Protective Service Occupations	\$57,796	4.75
35-0000	Food Preparation and Serving-Related Occupations	\$23,778	22.60
37-0000	Building and Grounds Cleaning and Maintenance Occupations	\$33,118	5.76
39-0000	Personal Care and Service Occupations	\$27,917	12.82
41-0000	Sales and Related Occupations	\$46,670	21.83
43-0000	Office and Administrative Support Occupations	\$44,134	28.94
45-0000	Farming, Fishing, and Forestry Occupations	\$28,395	0.17
47-0000	Construction and Extraction Occupations	\$62,313	3.07
49-0000	Installation, Maintenance, and Repair Occupations	\$56,039	6.19
51-0000	Production Occupations	\$41,629	3.55
53-0000	Transportation and Material Moving Occupations	\$42,568	9.92

Note: The calculations assume a development project of prototype H-4 with 180 units.

Source: ADE, Inc., data from IMPLAN3 input-output model and California Labor Market Information Division.

Table A-7
Summary of Induced Employment Impacts by Occupation
Prototype H-5: High-Rise Rental Apartments on Prime Sites
Downtown, Jack London, Broadway-Valdez, and Parts of Estuary Waterfront

SOC Code	Occupational Title	Mean Annual Wage	Induced Jobs
	Total all occupations		275.18
11-0000	Management Occupations	\$132,921	13.72
13-0000	Business and Financial Operations Occupations	\$85,001	14.70
15-0000	Computer and Mathematical Occupations	\$102,401	5.62
17-0000	Architecture and Engineering Occupations	\$99,815	2.92
19-0000	Life, Physical, and Social Science Occupations	\$88,094	2.53
21-0000	Community and Social Services Occupations	\$55,951	6.23
23-0000	Legal Occupations	\$112,338	1.98
25-0000	Education, Training, and Library Occupations	\$60,666	9.50
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	\$59,672	4.46
29-0000	Healthcare Practitioners and Technical Occupations	\$107,400	18.54
31-0000	Healthcare Support Occupations	\$39,944	8.81
33-0000	Protective Service Occupations	\$57,796	7.34
35-0000	Food Preparation and Serving-Related Occupations	\$23,778	35.24
37-0000	Building and Grounds Cleaning and Maintenance Occupations	\$33,118	8.94
39-0000	Personal Care and Service Occupations	\$27,917	19.97
41-0000	Sales and Related Occupations	\$46,670	34.10
43-0000	Office and Administrative Support Occupations	\$44,134	45.01
45-0000	Farming, Fishing, and Forestry Occupations	\$28,395	0.26
47-0000	Construction and Extraction Occupations	\$62,313	4.74
49-0000	Installation, Maintenance, and Repair Occupations	\$56,039	9.59
51-0000	Production Occupations	\$41,629	5.52
53-0000	Transportation and Material Moving Occupations	\$42,568	15.44

Note: The calculations assume a development project of prototype H-5 with 220 units.

Source: ADE, Inc., data from IMPLAN3 input-output model and California Labor Market Information Division.

APPENDIX B

HOUSING AFFORDABILITY GAP ANALYSIS

Estimating the housing affordability gap is necessary to calculate the maximum legal housing impact fees. The affordability gap is used to calculate the cost of developing affordable housing for new worker households with lower and moderate incomes (see Step 9 of the nexus methodology). This Appendix presents the analytic steps taken to calculate the housing affordability gap and the results of the calculations.

The housing affordability gap is defined as the difference between what extremely low-, very low-, low-, and moderate-income households can afford to pay for housing and the costs of developing new, modest housing units for those households. Calculating the housing affordability gap involves the following three steps:

1. Estimating affordable rents and housing prices for households in targeted income groups.
2. Estimating development costs of building new, modest housing units, based on current costs and additional market data.
3. Calculating the difference between what renters and owners can afford to pay for housing and the development costs of rental and ownership units.

Each step is described in the sections that follow.

ESTIMATING AFFORDABLE RENTS AND SALES PRICES

The first step in calculating the housing affordability gap is to determine the maximum amount that households at the targeted income levels can afford to pay for housing. For eligibility purposes, most affordable housing programs define extremely low-income households as those earning approximately 30 percent or less of area median income (AMI), very low-income households as those earning approximately 50 percent or less of AMI, low-income households as those earning between 51 and 80 percent of AMI, and moderate-income households as those earning between 81 and 120 percent of AMI. In order to ensure that the calculations to define affordability do not overstate affordability for the categories defined by ranges, this analysis does not use the top incomes for the low- and moderate-income groups, 80% and 120% respectively, but uses lower threshold incomes for those groups.

Table B-1 presents the unit types and household sizes used in the gap analysis. Table B-2 provides the income assumptions that are used.

Table B-1
Unit Types and Household Sizes
Used in Housing Affordability Gap Analysis

Unit Type	Rental Household Size	Ownership Household Size
Studio	1 person	NA
1-bedroom	2 person	1.5 person
2-bedroom	3 person	3 person
3- bedroom	4 person	4 person
4- bedroom	5 person	5 person

Source: Vernazza Wolfe Associates Inc.

Table B-2
Income Assumptions by Tenure
Used in Affordability Gap Analysis

Income Category	Percent of Area Median Income Assumed in Gap Calculations/a/
Rental Housing	
Extremely Low-Income	30%
Very Low-Income	50%
Low-Income/b/	60%
Moderate-Income/c/	110%
Ownership Housing	
Very Low-Income	50%
Low-Income/b/	70%
Moderate-Income/c/	110%

/a/ Area median income for the City of Oakland

/b/ Although the Affordability Gap calculations use 60% (for rental) and 70% (for owners) of AMI for affordability gap calculations, the Housing Impact Fee calculations for rental housing still include households up to 80% AMI as low-income.

/c/ Although the Affordability Gap calculations use 110% of AMI for both rental and ownership affordability gap calculations, the Housing Impact Fee calculations still include households up to 120% AMI as moderate-income.

Source: Vernazza Wolfe Associates Inc.

Table B-3 shows the incomes used for both the rental and ownership gap calculations for the different affordable income categories. Table B-4 demonstrates the rents that are affordable at each income level used in this study. The maximum affordable monthly rent is calculated as 30 percent of gross monthly household income, minus a deduction for utilities. The utility allowance is included in both the rental and ownership affordability calculations. Assumptions used in the calculation of utility costs are based on schedules provided by the Oakland Housing Authority (based on unit sizes) and information from the US Census on utilities commonly used in rental and ownership housing units.

Table B-3
City of Oakland Income Limits
By Tenure for Affordability Gap Analysis

Income Category	Number of Persons in Household					
	1	1.5	2	3	4	5
Rental Housing						
Extremely Low Income (30% AMI)	\$19,500	NA	\$22,300	\$25,100	\$27,850	\$30,100
Very Low Income (50% AMI)	\$32,550	NA	\$37,200	\$41,850	\$46,450	\$50,200
Low Income (60% AMI)	\$39,060	NA	\$44,640	\$50,220	\$55,740	\$60,240
Moderate Income (110% AMI)	\$71,995	NA	\$82,280	\$92,565	\$102,850	\$111,100
Ownership Housing						
Very Low Income (50% AMI)	\$32,550	\$34,875	\$37,200	\$41,850	\$46,450	\$50,200
Low Income (70% AMI)	\$44,610	\$47,790	\$50,970	\$57,340	\$63,670	\$68,800
Moderate Income (110% AMI)	\$71,995	\$77,138	\$82,280	\$92,565	\$102,850	\$111,100

Note: 30%, 50%, 60%, and 70% of AMI income limits provided by the City of Oakland based on the 2015 HOME Income Limits. 110% of AMI calculated based on median household incomes provided by the City of Oakland.

Sources: City of Oakland; Vernazza Wolfe Associates, Inc., 2015.

Table B-4
Affordable Rent Calculations by Income Level and Unit Type

	Studio				
	1	2	3	4	5
Household Size (Persons per HH)					
Extremely Low Income (30% AMI)					
Maximum Household Income at 30% AMI	\$19,500	\$22,300	\$25,100	\$27,850	\$30,100
Maximum Monthly Housing Cost/a/	\$488	\$558	\$628	\$696	\$753
Utility Deduction/b/	\$34	\$40	\$49	\$60	\$74
Maximum Available for Rent/c/	\$454	\$518	\$579	\$636	\$679
Maximum Available for Rent (Unit Type)	\$454	\$518	\$579	\$636	\$679
Very Low Income (50% AMI)					
Maximum Household Income at 50% AMI	\$32,550	\$37,200	\$41,850	\$46,450	\$50,200
Maximum Monthly Housing Cost/a/	\$814	\$930	\$1,046	\$1,161	\$1,255
Utility Deduction/b/	\$34	\$40	\$49	\$60	\$74
Maximum Available for Rent/c/	\$780	\$890	\$997	\$1,101	\$1,181
Maximum Available for Rent (Unit Type)	\$780	\$890	\$997	\$1,101	\$1,181
Low Income (60% AMI)					
Maximum Household Income at 60% AMI	\$39,060	\$44,640	\$50,220	\$55,740	\$60,240
Maximum Monthly Housing Cost/a/	\$977	\$1,116	\$1,256	\$1,394	\$1,506
Utility Deduction/b/	\$34	\$40	\$49	\$60	\$74
Maximum Available for Rent/c/	\$943	\$1,076	\$1,207	\$1,334	\$1,432
Maximum Available for Rent (Unit Type)	\$943	\$1,076	\$1,207	\$1,334	\$1,432
Moderate Income (110% AMI)					
Maximum Household Income at 110% AMI	\$71,995	\$82,280	\$92,565	\$102,850	\$111,100
Maximum Monthly Housing Cost/a/	\$1,800	\$2,057	\$2,314	\$2,571	\$2,778
Utility Deduction/b/	\$34	\$40	\$49	\$60	\$74
Maximum Available for Rent/c/	\$1,766	\$2,017	\$2,265	\$2,511	\$2,704
Maximum Available for Rent (Unit Type)	\$1,766	\$2,017	\$2,265	\$2,511	\$2,704

/a/ 30 percent of maximum monthly household income.

/b/ Assumptions used in the calculation of utility costs are based on schedules by unit size provided by the Oakland Housing Authority and information from the US Census on utilities commonly used in rental and ownership housing units.

/c/ Maximum monthly housing cost minus utility deduction.

Sources: City of Oakland, 2015; Oakland Housing Authority, 2014; Vernazza Wolfe Associates, Inc. 2015

Table B-5 presents the affordable homeownership calculations which are more complex than the affordable rental housing calculations. Very low-income and low-income homeowners are assumed to pay a maximum of 30 percent of gross monthly income on total housing costs, and moderate-income households are assumed to pay 35% of gross monthly income on total housing costs. The maximum affordable price for for-sale housing is then calculated based on the total monthly mortgage payment that a homeowner could afford, using standard loan terms used by CalHFA programs and many private lenders for first-time homebuyers, including a five percent down payment.

Table B-5
Affordable Sales Price Calculations by Income Level and Unit Type

Income Level and Unit Type/a/	Affordable Sales Price/b/
Very Low-Income Households (50% AMI)	
1 Bedroom	\$61,657
2 Bedroom	\$87,572
3 Bedroom	\$104,663
4 Bedroom	\$118,596
Low-Income Households (70% AMI)	
1 Bedroom	\$109,641
2 Bedroom	\$145,124
3 Bedroom	\$168,642
4 Bedroom	\$187,702
Moderate-Income Households (110% AMI)	
1 Bedroom	\$266,445
2 Bedroom	\$333,318
3 Bedroom	\$377,900
4 Bedroom	\$413,660

/a/ The sales price table differs from the rental table in that a studio unit is not included for the sales calculations. This reflects the fact that there are no studio units developed for sale in single-family detached or townhouse development in the Oakland housing market.

/b/ Assumes 30% of gross annual household income allocated to housing costs. Affordable sales prices are based on a number of assumptions, including standard loan terms for first-time homebuyers used by CalHFA programs and many private lenders:

Downpayment: 5%

Mortgage term: 30-year fixed rate

Interest rate: 4.125%

Property mortgage insurance: 0.89% of sales price

Property insurance: 0.35% of sales price

Property maintenance reserve: \$300 per month

Source: Vernazza Wolfe Associates Inc.

ESTIMATING HOUSING DEVELOPMENT COSTS

The second step in calculating the housing affordability gap is to estimate the cost of developing new, modest housing units. Modest housing is defined slightly differently for rental and ownership housing. For rental housing, the costs and characteristics of modest housing are similar to recent projects developed in Oakland by the affordable rental housing development sector. Modest for-sale housing is assumed to be similar to modest sized and priced single-family homes developed in Oakland.

The calculation of housing development costs used in the housing affordability gap analysis requires several steps. Because the gap covers both rental housing and for-sale housing, it is necessary to estimate costs for each separately. Table B-6 presents development costs for rental and ownership housing.

Rental Housing Development Costs

No one rental housing project is used to model rental housing development costs. Costs used in this Study are more “synthetic” in nature and depend on multiple data sources. The determination of new rental unit development costs relied on two steps. First, it is necessary to develop costs per square foot. For this analysis, pro formas from four Oakland, affordable, family rental developments were examined.¹⁰ The average development cost per square foot is \$515/SF for mid-rise multi-family development.

The second step is to determine the size of rental units (in square feet). This rounded size estimate is undertaken for all unit sizes - studio units through four-bedroom units. Once unit sizes are determined, the same square foot cost measure is applied to each unit size to develop estimates of rental housing development costs for each unit size included in the analysis.¹¹

For-Sale Housing Development Costs

To model for-sale housing development costs, there were fewer examples to consider. However, two recent modest developments in East Oakland were studied – Arcadia Park in East Oakland and a recent Habitat for Humanity development on Edes Avenue and adjacent streets, also in East Oakland. The City of Oakland provided a pro forma for the Habitat for Humanity homes. For Arcadia Park, this study used initial sales price information, provided by DataQuick (to provide the basis for estimating total development costs). Again, average costs per SF were estimated. Based on this information, a development cost of \$400/SF was estimated and used in

¹⁰ These projects include developments at 3706 San Pablo, West Grand and Brush, Phase I at 94th and International, and 1701 MLK.

¹¹ In reality, square foot costs are not the same across unit sizes. For example, they are generally higher for smaller units and lower for larger units. However, for the purpose of this study, the cost measure developed was an average across several different unit sizes.

the analysis.¹² Rounded unit size information for the one- through four-bedroom units included in the gap analysis was based on the Habitat for Humanity homes.¹³

Table B-6			
Unit Types, Sizes, and Costs Used in Housing Affordability Gap Analysis			
	Unit Type by Number of Bedrooms	Unit Size (net SF)	Development Costs
Rental Housing Development Cost @ \$515 per Net SF			
(mid-rise multi-family development)			
	Studio	500	\$257,500
	1	600	\$309,000
	2	850	\$437,750
	3	1,200	\$618,000
	4	1,500	\$772,500
For-Sale Housing Development Cost @ \$400 per Net SF			
(modest, single-family home development)			
	1	900	\$360,000
	2	1,150	\$460,000
	3	1,450	\$580,000
	4	1,500	\$600,000
Sources: Vernazza Wolfe Associates, Inc., City of Oakland Housing Pro Formas, and DataQuick Sales Data.			

CALCULATING THE HOUSING AFFORDABILITY GAP

The final step in the analysis is to calculate the housing affordability gap, or the difference between what renters and owners can afford to pay and the total cost of developing new units. The purpose of the housing affordability gap calculation is to help determine the fee amount that would be necessary to cover the cost of developing housing for extremely low-, very low-, low-, and moderate-income households.¹⁴ The calculation does not assume the availability of any other source of housing subsidy because not all "modest" housing is built with public subsidies, and because tax credits and tax-exempt bond financing are highly competitive programs that will not always be available to developers of modest housing units.

¹² The Habitat for Humanity costs includes prevailing wages.

¹³ Arcadia Park homes are all three-bedroom units and are slightly larger than the three-bedroom, Habitat for Humanity homes. Arcadia Park homes have three bathrooms, and Habitat for Humanity homes average two bathrooms per unit.

¹⁴ Although the affordability gap calculations are done for developing housing for extremely low-, very low-, low-, and moderate-income households, the nexus calculations do not use the gap amounts for extremely low-income households as the IMPLAN3 Model results do not identify worker households in that category.

Table B-7 shows the housing affordability gap calculations for rental housing units. For each rental unit type and income level, the gap is defined as the difference between the per-unit cost of development and the supportable debt per unit. The supportable debt is calculated based on the net operating income generated by an affordable monthly rent, incorporating assumptions about operating expenses, reserves, vacancy and collection loss, and market-rate mortgage terms. Because household sizes are not uniform and the type of units each household may occupy is variable, the housing affordability gap is calculated by averaging the housing affordability gaps for the unit sizes (studios through four-bedroom units).

**Table B-7
Rental Housing Affordability Gap Calculations**

Income Level and Unit Type	Unit Size (SF)	Maximum Monthly Rent/a/	Annual Income	Net Operating Income/b/	Available for Debt Service/c/	Supportable Debt/d/	Development Costs/e/	Affordability Gap
Extremely Low-Income (30% AMI)								
Studio	500	\$454	\$5,442	(\$2,330)	\$0	\$0	\$257,500	\$257,500
1 Bedroom	600	\$518	\$6,210	(\$1,601)	\$0	\$0	\$309,000	\$309,000
2 Bedroom	850	\$579	\$6,942	(\$905)	\$0	\$0	\$437,750	\$437,750
3 Bedroom	1,200	\$636	\$7,635	(\$247)	\$0	\$0	\$618,000	\$618,000
4 Bedroom	1,500	\$679	\$8,142	\$235	\$235	\$3,106	\$772,500	\$769,394
Average Affordability Gap/f/								
Average Affordability Gap/f/								
Very Low-Income (50% AMI)								
Studio	500	\$780	\$9,357	\$1,389	\$1,111	\$14,695	\$257,500	\$242,805
1 Bedroom	600	\$890	\$10,680	\$2,646	\$2,117	\$27,990	\$309,000	\$281,010
2 Bedroom	850	\$997	\$11,967	\$3,869	\$3,095	\$40,923	\$437,750	\$396,827
3 Bedroom	1,200	\$1,101	\$13,215	\$5,054	\$4,043	\$53,465	\$618,000	\$564,535
4 Bedroom	1,500	\$1,181	\$14,172	\$5,963	\$4,771	\$63,082	\$772,500	\$709,418
Average Affordability Gap/f/								
Average Affordability Gap/f/								
Low-Income (60% AMI)								
Studio	500	\$943	\$11,310	\$3,245	\$2,596	\$34,321	\$257,500	\$223,179
1 Bedroom	600	\$1,076	\$12,912	\$4,766	\$3,813	\$50,420	\$309,000	\$258,580
2 Bedroom	850	\$1,207	\$14,478	\$6,254	\$5,003	\$66,157	\$437,750	\$371,593
3 Bedroom	1,200	\$1,334	\$16,002	\$7,702	\$6,162	\$81,472	\$618,000	\$536,528
4 Bedroom	1,500	\$1,432	\$17,184	\$8,825	\$7,060	\$93,351	\$772,500	\$679,149
Average Affordability Gap/f/								
Average Affordability Gap/f/								
Moderate-Income (110% AMI)								
Studio	500	\$1,766	\$21,191	\$12,631	\$10,105	\$133,613	\$257,500	\$123,887
1 Bedroom	600	\$2,017	\$24,204	\$15,494	\$12,395	\$163,897	\$309,000	\$145,103
2 Bedroom	850	\$2,265	\$27,182	\$18,322	\$14,658	\$193,819	\$437,750	\$243,931
3 Bedroom	1,200	\$2,511	\$30,135	\$21,128	\$16,903	\$223,499	\$618,000	\$394,501
4 Bedroom	1,500	\$2,704	\$32,442	\$23,320	\$18,656	\$246,683	\$772,500	\$525,817
Average Affordability Gap/f/								
Average Affordability Gap/f/								

Note: The calculations do not assume the availability of any other sources of housing subsidy because not all "modest" housing is built with public subsidies, and tax credits and tax-exempt bond financing are highly competitive programs that will not always be available to developers of modest housing units.

/a/ Affordable rents are based on City of Oakland's 2015 Income Limits. These are net rents, since utility costs have been deducted.

/b/ Amount available for debt. Assumes 5% vacancy and collection loss and \$7,500 per unit for operating expenses and reserves.

/c/ Assumes 1.25 Debt Coverage Ratio.

/d/ Assumes 5.38%, 30 year loan. Calculations based on annual payments.

/e/ Assumes development cost of \$515 per net square foot on rental units.

/f/ Calculated as the simple average across all unit sizes because of variability in the relationship between household size and the type of unit occupied.

Sources: Vernazza Wolfe Associates, Inc., and selected Oakland Rental Housing Pro Formas.

Table B-8 shows the housing affordability gap calculations for ownership units.¹⁵ For each unit type, the gap is calculated as the difference between the per-unit cost of development and the affordable sales price at each income level. As with rental housing, the average housing affordability gap for each income level is calculated by averaging the housing affordability gaps across unit sizes.

Table B-8				
For-Sale Housing Affordability Gap Calculations				
Income Level and Unit Type	Unit Size (SF)	Affordable Sales Price/a/	Development Costs/b/	Affordability Gap/c/
Very Low-Income (50% AMI)				
1 Bedroom	900	\$61,657	\$360,000	\$298,343
2 Bedroom	1,150	\$87,572	\$460,000	\$372,428
3 Bedroom	1,450	\$104,663	\$580,000	\$475,337
4 Bedroom	1,500	\$118,596	\$600,000	\$481,404
Average Affordability Gap/d/				\$406,878
Low Income (70% of AMI)				
1 Bedroom	900	\$109,641	\$360,000	\$250,359
2 Bedroom	1,150	\$145,124	\$460,000	\$314,876
3 Bedroom	1,450	\$168,642	\$580,000	\$411,358
4 Bedroom	1,500	\$187,702	\$600,000	\$412,298
Average Affordability Gap/d/				\$347,223
Moderate Income (110% of AMI)				
1 Bedroom	900	\$266,445	\$360,000	\$93,555
2 Bedroom	1,150	\$333,318	\$460,000	\$126,682
3 Bedroom	1,450	\$377,900	\$580,000	\$202,100
4 Bedroom	1,500	\$413,660	\$600,000	\$186,340
Average Affordability Gap/d/				\$152,169
Note: The calculations do not assume the availability of any other sources of housing subsidy because not all "modest" housing is built with public subsidies, and tax credits and tax-exempt bond financing are highly competitive programs that will not always be available to developers of modest housing units.				
/a/ See Table A-5.				
/b/ Assumes \$400/SF for development costs.				
/c/ Calculated as the difference between affordable sales price and development cost.				
/d/ Calculated as the simple average across all unit sizes because of variability in the relationship between household size and the type of unit occupied.				
Sources: Vernazza Wolfe Associates, Inc., Habitat for Humanity pro forma, and DataQuick Sales Data.				

¹⁵ The affordability gap for ownership housing is not calculated for the extremely low-income category.

Finally, Table B-9 presents the tenure-neutral estimates of the housing affordability gap for extremely low-, very low-, low-, and moderate-income households by averaging the rental and ownership gaps for each income group. The calculated average affordability gap per household is \$478,329 for extremely low-income households, \$422,898 for very low-income households, \$380,514 for low-income households, and \$219,409 for moderate-income households. The housing affordability gap is highest for extremely low- income households because they have the least money to spend on housing costs. The gap is also higher for rental housing due to the higher development cost per square foot in comparison to for-sale development costs.¹⁶

Table B-9
Combined Average Affordability Gap by Income Group

Income Level	Rental Gap	Ownership Gap	Combined Average Affordability Gap
Extremely Low-Income (30% AMI)	\$478,329	NA	\$478,329
Very Low-Income (50% AMI)	\$438,919	\$406,878	\$422,898
Low-Income (60% - 70% AMI)	\$413,806	\$347,223	\$380,514
Moderate-Income (110% AMI)	\$286,648	\$152,169	\$219,409

Source: Vernazza Wolfe Associates, Inc. 2015.

¹⁶ As identified earlier in this appendix, the development of rental housing assumes mid-rise multi-family development which is higher cost per square foot than development of modest, single-family homes as ownership housing.