



KEYSER MARSTON ASSOCIATES

**RESIDENTIAL NEXUS ANALYSIS
Honolulu, Hawaii**

Prepared for
City and County of Honolulu

Prepared by:
Keyser Marston Associates, Inc.

September 2015

TABLE OF CONTENTS

	<i>Page</i>
I. EXECUTIVE SUMMARY	1
II. INTRODUCTION AND OVERVIEW	10
III. NEXUS ANALYSIS	14
A. MARKET RATE UNITS AND HOUSEHOLD INCOME	14
B. THE IMPLAN MODEL	29
C. THE KMA JOBS HOUSING NEXUS MODEL	32
D. MITIGATION COSTS	48
ADDENDUM: ADDITIONAL BACKGROUND AND NOTES ON SPECIFIC ASSUMPTIONS	58
APPENDIX 1: MARKET SURVEY	60
APPENDIX 2: SUPPORTING TECHNICAL ANALYSIS TABLES	70

I. EXECUTIVE SUMMARY

Keyser Marston Associates (KMA) prepared this residential nexus analysis for the City and County of Honolulu pursuant to a contractual agreement. This Executive Summary contains a concise overview of the residential nexus analysis; full documentation of the analysis is contained in the body of the Report and its Appendices.

A. Residential Nexus Analysis

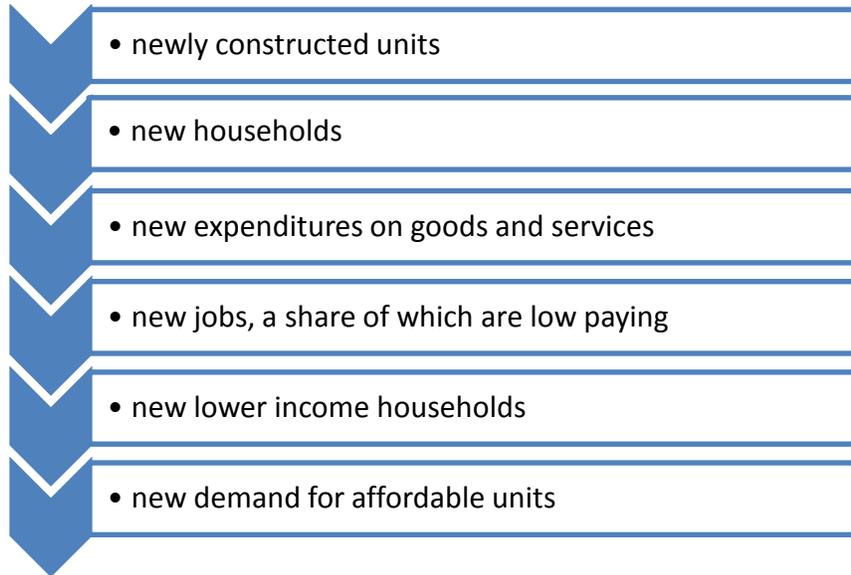
A residential nexus analysis demonstrates and quantifies the impact of new market rate housing development on the demand for affordable housing. The underlying nexus concept is that the newly constructed market rate units represent net new households in Honolulu. These households represent new income in Honolulu that will consume goods and services, either through purchases of goods and services or 'consumption' of government services. New consumption translates to jobs; a portion of the jobs are at lower compensation levels; low compensation jobs relate to lower income households that cannot afford market rate units in Honolulu and therefore need affordable housing.

The City and County of Honolulu has requested this Residential Nexus Analysis in conjunction with the consideration of potential inclusionary requirements applicable to new residential development in Oahu as one component of the proposed Housing Oahu: Islandwide Housing Strategy. The purpose of this Residential Nexus Analysis is to provide information about the impact that new residential development has on the need for affordable housing and to determine inclusionary housing percentage and in-lieu fee requirements that are proportionate to these impacts and sufficient to fully mitigate them.

1. Impact Methodology and Models Used

The analysis is performed using two models. The IMPLAN model is an industry accepted, commercially available model developed over 30 years ago to quantify the impacts of changes in a local economy, including the employment impacts of changes in personal income. The input into the IMPLAN model is net new personal income in Honolulu available for expenditures; the IMPLAN model then estimates a distribution of expenditures and ultimately produces a quantification of jobs generated by industry. IMPLAN is based on a similar methodology to the Hawaii's State Input Output Study developed by the Department of Business Economic Development and Tourism. The analysis uses the IMPLAN data set for Honolulu. The KMA Jobs Housing Nexus model, which was initially developed over 25 years ago to analyze the income structure of job growth, is used to determine the household income of new employee households and identify how many are in five housing affordability tiers ranging from Extremely Low-Income up through 140% of Area Median Income (AMI).

Nexus Analysis Concept



To illustrate the linkages by looking at a simplified example, we can take an average household that buys a house at a certain price. From that price, we estimate the gross income of the household (from mortgage rates and lending practices) and the portion of income available for expenditures. Households will “purchase” or consume a range of goods and services, such as purchases at the supermarket or services at the bank. Purchases in the local economy in turn generate employment. The jobs generated are at different compensation levels. Some of the jobs are low paying and as a result, even when there is more than one worker in the household, there are some lower and middle-income households who cannot afford market rate housing in Honolulu.

An underlying assumption of the analysis is that households that purchase or rent new units represent net new households in Honolulu. The nexus does not make the argument that construction of new units is solely responsible for population and household growth. Household growth in Honolulu occurs through a combination of natural increases in population and relocations from off-island. Construction of new residential units is a major contributing cause to population and household growth because without new housing supply, population and household growth would not continue to occur over a sustained period. In the short-term, population growth may occur without additions to the housing supply through accommodating additional people within the existing housing stock. However, over the long-term, households would not continue to relocate to Honolulu from off-island if they could not find adequate housing available. Without construction of new housing, out-migration could also become more of a factor offsetting natural increases in population as households seek places where housing is more available. Families may respond to a lack of adequate housing by delaying childbearing or having fewer children. Recent college graduates born in Honolulu may decide not to return based on challenges in finding adequate housing.

2. Market Survey and Residential Prototypes

The first step of the nexus analysis is to identify residential prototypes that are representative of what is generally being built by the private marketplace in Honolulu. KMA developed programmatic assumptions in consultation with the City and County of Honolulu for five residential prototypes – four ownership prototypes and one rental prototype. KMA then undertook a market survey of projects covering these prototypes to estimate sales prices and rent levels for the prototype units. The prototypes are designed to be representative of averages for residential development activity occurring island-wide as described in the Appendix 1 market survey. The prototypes are summarized in the following table.

Prototypical Residential Units					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Avg. Unit Size	1,700 SF	1,200 SF	1,000 SF	1,000 SF	900 SF
Avg. Sales Price / Rent	\$700,000	\$575,000	\$525,000	\$700,000	\$2,500 /mo.

From the sales prices and rent levels, household income is determined using assumptions with respect to a share of income spent on housing and housing purchase terms. For ownership units, 37% of income is spent on housing (including mortgage payments, property taxes, home owner association dues, and insurance) based on the current average for new purchase home loans being underwritten in Honolulu. Renters are assumed to spend 30% of their income on rent, a relationship commonly used in housing policy to establish affordable rent levels relative to income.

Gross household income is adjusted to a net amount available for expenditures after deducting the portion of income dedicated to income taxes, contributions to Social Security and Medicare, savings, and repayment of household debt. Housing costs are not deducted as part of this adjustment step because they are addressed separately as expenditures within the IMPLAN model. In addition, an adjustment is made to account for rental vacancy and a share of ownership units likely to be used as second homes and occupied only part of the year. The adjusted household income available for expenditures becomes the input into the IMPLAN model. As a result, household income and expenditures associated with each of the prototypes is as follows:

Household Income and Expenditures					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Gross Household Income	\$115,000	\$101,000	\$95,000	\$127,000	\$100,000
Percent Income available for Expenditures	67%	71%	72%	67%	65%
Spending adjustment for vacancy/ 2 nd homes occupied part of year	99%	96%	96%	96%	95%
Household Income Available for Expenditures [Input to IMPLAN model]	\$76,300	\$68,800	\$65,700	\$81,700	\$61,800

The nexus analysis is conducted on 100-unit project modules (i.e., 100 new households) for ease of presentation and to avoid awkward fractions.

3. IMPLAN Model Results

The IMPLAN model was applied to link household income to job growth occurring in Honolulu. IMPLAN data sets are available for each county in the United States and are tailored to reflect the economic base in each area. The analysis uses the IMPLAN data set for Honolulu. The IMPLAN model distributes spending among various types of goods and services based on data from the Consumer Expenditure Survey and the Bureau of Economic Analysis Benchmark input-output study, to estimate employment generated. Job creation, driven by increased demand for products and services, is projected for each of the industries that will serve the new households. The employment generated by this new household spending is summarized in the following table.

Jobs Generated Per 100 Units					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Annual Household Expenditures (100 Units)	\$7,630,000	\$6,880,000	\$6,570,000	\$8,170,000	\$6,180,000
Total Jobs Generated per IMPLAN, 100 Units	67.1	60.5	55.7	71.8	54.3
Net New Jobs after 17% reduction for declining industries	55.7	50.2	46.2	59.6	45.1

The IMPLAN model quantifies jobs generated at establishments that serve new residents directly (i.e. supermarkets, banks or schools), jobs generated by increased demand at firms which service or supply these establishments (wholesalers, janitorial contractors, accounting

firms, or any jobs down the service/supply chain from direct jobs), and jobs generated when the new employees spend their wages in the local economy and generate additional jobs. Retail, restaurants, and health care represent the largest share of jobs generated by household expenditures.

Employment estimates represent net new jobs after making a 17% downward adjustment to the IMPLAN employment estimates based on the expectation that a portion of jobs will be filled by existing workers who already have housing. The 17% adjustment is based upon job losses in declining sectors of the local economy over a historic period. “Downsized” workers from declining sectors are assumed to fill a portion of the new jobs in sectors that serve residents.

4. Compensation Levels of Jobs and Household Income

The output of the IMPLAN model – the numbers of jobs by industry – is then entered into the Keyser Marston Associates jobs housing nexus analysis model to quantify the compensation levels of new jobs and the income of the new worker households. The KMA model sorts the jobs by industry into jobs by occupation, based on national data, and then attaches local wage distribution data to the occupations, using recent data for Honolulu from the Bureau of Labor Statistics Occupational Employment Survey. Further description is provided in Section III. C.

The KMA model makes a conversion from number of employees to the number of employee households, recognizing that there is, on average, more than one worker per household, and thus the number of housing units in demand for new workers is reduced. The calculation is shown in the table below. For purposes of the adjustment from jobs to housing units, the average of 1.92 workers per working household in Honolulu is used, which is a higher number of workers per household than in other jurisdictions KMA has performed similar analyses. Application of the 1.92 factor effectively assumes the existing pattern of high numbers of workers per housing unit will continue and result in a reduced need for affordable units.

Adjustment from No. of Workers to No. of Households					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Net New Jobs	55.7	50.2	46.2	59.6	45.1
Divide by No. of Workers per Worker Household in Honolulu	1.92	1.92	1.92	1.92	1.92
Net new worker households	29.0	26.2	24.1	31.1	23.5

The output of the model is the number of new worker households by income level (expressed in relation to the Area Median Income, or AMI) attributable to the new residential units and new households in Honolulu. Five categories are addressed: Extremely Low (under 30% of AMI), Very Low (30% to 50% of AMI), Low (50% to 80% of AMI), Moderate (80% to 120% of AMI), and a “140% AMI Tier” representing household incomes from 120% to 140% of AMI.

Following are the numbers of worker households by income level associated with the Honolulu prototype units.

<i>New Worker Households by Income Level per 100 Market Rate Units</i>					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Extr. Low (0% - 30% AMI)	4.0	3.6	3.2	4.3	3.2
Very Low (30% - 50% AMI)	7.7	7.0	6.4	8.3	6.2
Low (50% - 80% AMI)	8.0	7.2	6.6	8.6	6.5
Moderate (80% - 120% AMI)	5.0	4.5	4.2	5.3	4.0
Subtotal through 120% AMI	24.7	22.2	20.4	26.4	20.0
140% Tier (120% -140% AMI)	1.2	1.1	1.0	1.3	1.0
Subtotal through 140% AMI	25.8	23.3	21.4	27.7	20.9
Greater than 140% AMI	3.2	2.9	2.7	3.4	2.6
Total, New Households	29.0	26.2	24.1	31.1	23.5

The above findings represent the number of new affordable units required to offset the new affordable housing demand associated with services to each 100 new market rate residential units.

5. Inclusionary Percentages Supported

Nexus findings regarding the number of affordable units needed per 100 market rate units can be converted to a percentage of units provided on-site within a project that would fully mitigate the affordable housing impacts. The percentages are calculated including both market rate and affordable units (for example, 25 affordable units per 100 market rate units translates to a project of 125 units; 25 affordable units out of 125 units equals 20%). Each tier is cumulative, or inclusive of the tiers above. The purpose of showing the figures on a cumulative basis is so they can be readily compared to potential inclusionary requirements that may be considered. As an example, for new single family projects, the analysis indicates that an inclusionary requirement of 19.8% with affordable units available to households earning up to 120% of AMI would be sufficient to mitigate the affordable housing needs of service worker households earning up through 120% of AMI. The percentages represent the inclusionary requirement that would be sufficient to fully offset the increased affordable housing need from the services and service workers that support the new residential development.

Cumulative Inclusionary Percentage to Mitigate Increased Affordable Housing Need					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Extr. Low (up to 30% AMI)	3.8%	3.5%	3.1%	4.1%	3.1%
Very Low (up to 50% AMI)	10.5%	9.5%	8.8%	11.1%	8.7%
Low (up to 80% AMI)	16.5%	15.1%	14.0%	17.4%	13.8%
Moderate (up to 120% AMI)	19.8%	18.2%	16.9%	20.9%	16.7%
140% Tier (up to 140% AMI)	20.5%	18.9%	17.6%	21.7%	17.3%

6. Impact Fee Levels Supported by the Nexus Analysis

The last step in the analysis puts a dollar amount on the cost of mitigating the affordable housing impacts. The conclusions of the nexus analysis, expressed as the number of worker households by income affordability category, are linked to the cost of delivering housing to the households in need. Each income or affordability tier is associated with a subsidy needed to produce and deliver a unit at the specified affordability level; this subsidy is referred to as the 'affordability gap.'

Affordability gaps are calculated for each of the five affordable tiers. The analysis assumes households earning less than 80% of Area Median Income will be assisted in rental units, while households earning between 80% and 140% of Area Median Income will be assisted in ownership units.

The resulting affordability gaps are as follows:

- \$367,300 for households in the under 30% AMI category;
- \$288,300 for households in the 30% to 50% AMI category;
- \$169,300 for households in the 50% to 80% AMI category;
- \$69,850 for households in the 80% to 120% AMI category; and
- \$0 (no affordability gap) for households in the 120% to 140% AMI category.

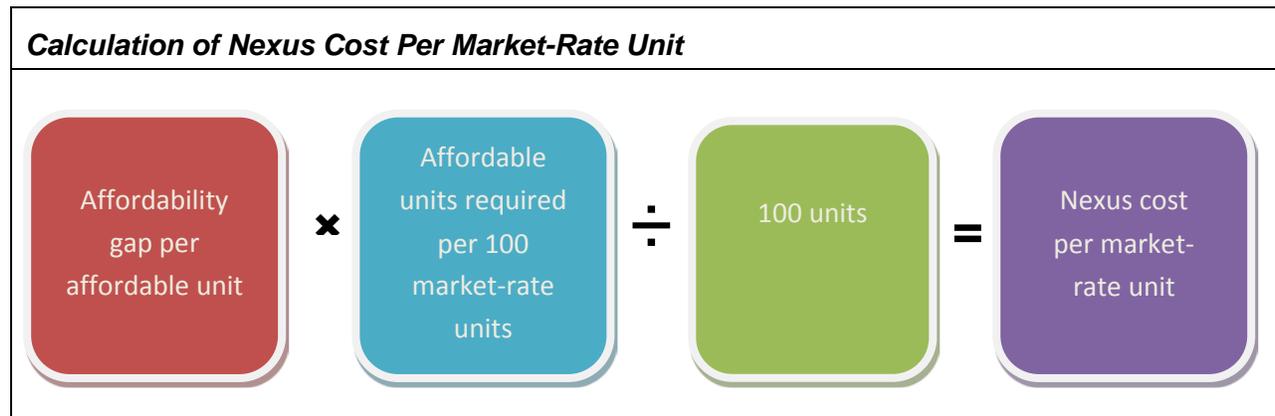
No affordability gap is indicated for the 140% AMI Tier based on sales prices affordable to this income level and development costs for affordable townhome units¹.

When the affordability gap conclusions for each income tier are linked to the number of affordable units required per 100 market rate units and divided by 100 units, the result is a Total Nexus Cost per new market rate residential unit. The results per unit are:

¹ Development costs are higher for other for-sale unit types such as high-rise. There would be an affordability gap associated with providing 140% AMI affordable units in other more expensive product types.

Nexus Cost Per Market Rate Unit						
<i>Income Category</i>	<i>Affordability Gap</i>	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Ext. Low (30% - 50% AMI)	\$367,300	\$14,600	\$13,200	\$11,900	\$15,700	\$11,800
Very Low (30% - 50% AMI)	\$288,300	\$22,200	\$20,100	\$18,300	\$23,800	\$18,000
Low (50%-80% AMI)	\$169,300	\$13,500	\$12,200	\$11,200	\$14,500	\$11,000
Moderate (80%-120% AMI)	\$69,850	\$3,500	\$3,100	\$2,900	\$3,700	\$2,800
140% Tier (120%-140% AMI)	None	\$0	\$0	\$0	\$0	\$0
Total Nexus Costs		\$53,800	\$48,600	\$44,300	\$57,700	\$43,600

The chart below illustrates how the above nexus costs per unit are calculated:

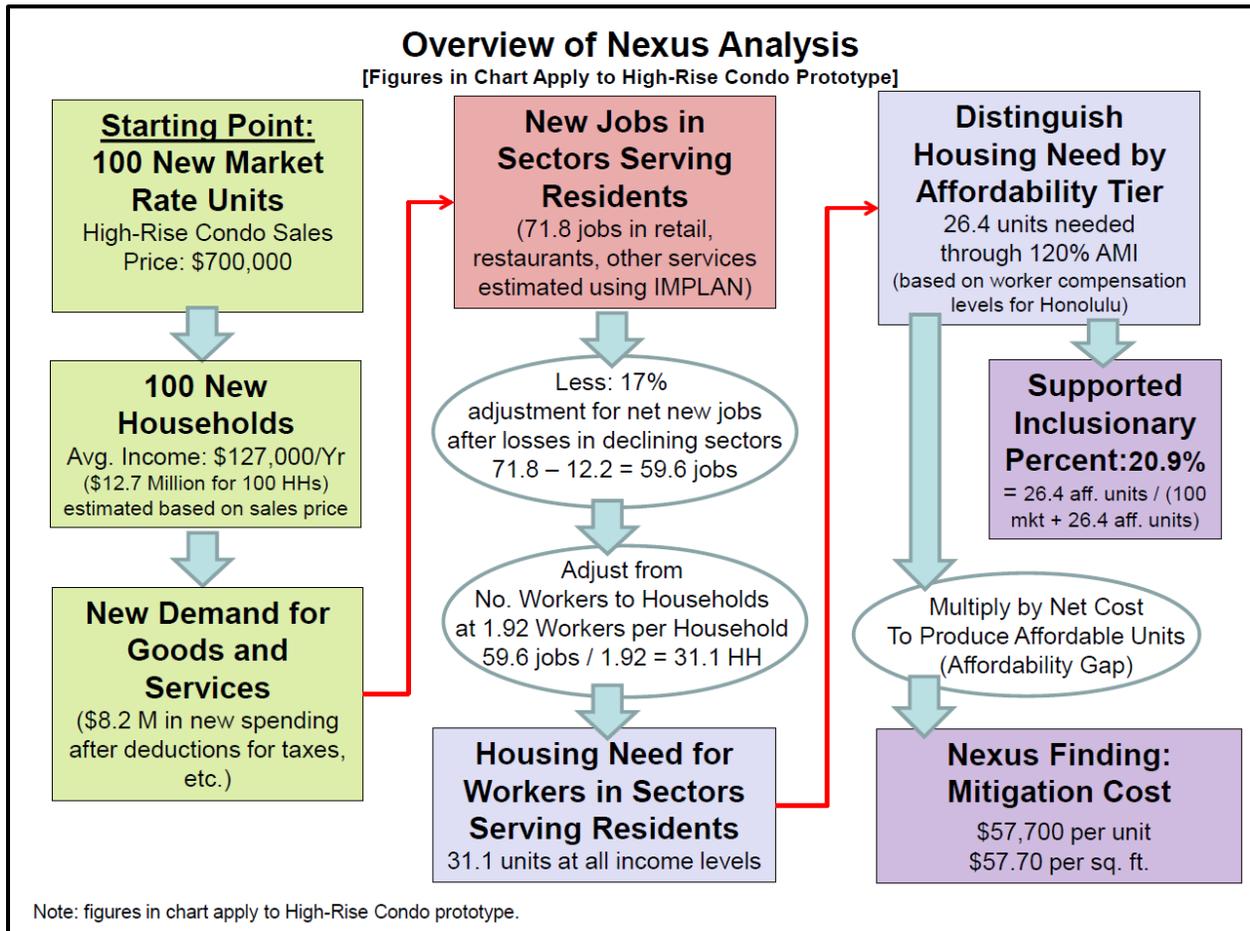


The Total Nexus Costs, or Mitigation Costs, indicated above, may also be expressed on a per square foot level. The results per square foot of building area (net rentable or sellable Sq.Ft.) are as follows:

Total Nexus Cost Per Sq.Ft. of Building Area						
<i>Income Category</i>	<i>Affordability Gap</i>	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
<i>Prototype Size</i>		<i>1,700 SF</i>	<i>1,200 SF</i>	<i>1,000 SF</i>	<i>1,000 SF</i>	<i>900 SF</i>
Ext. Low (30% - 50% AMI)	\$367,300	\$8.60	\$11.00	\$11.90	\$15.70	\$13.10
Very Low (30% - 50% AMI)	\$288,300	\$13.10	\$16.80	\$18.30	\$23.80	\$20.00
Low (50%-80% AMI)	\$169,300	\$7.90	\$10.20	\$11.20	\$14.50	\$12.20
Moderate (80%-120% AMI)	\$69,850	\$2.10	\$2.60	\$2.90	\$3.70	\$3.10
140% Tier (120%-140%)	none	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total Nexus Costs		\$31.70	\$40.60	\$44.30	\$57.70	\$48.40

These costs express the total linkage or nexus costs for the five prototype developments in Honolulu. These total nexus costs represent the cost of creating new affordable units to offset increased affordable housing needs associated with new market-rate residential development. **The totals are not recommended levels for fees; many other policy considerations may be brought to bear in selecting appropriate in-lieu fee requirements.**

The flow chart below provides a graphical illustration of the nexus analysis.



II. INTRODUCTION AND OVERVIEW

This report documents and quantifies the linkages between new market-rate residential development in Honolulu and the demand for additional affordable housing. The analysis, which demonstrates support for an affordable housing requirement, has been prepared by Keyser Marston Associates (KMA) for the City and County of Honolulu in accordance with a contractual agreement.

Analyses of the impacts of new development are called linkage or nexus analyses. This nexus analysis establishes inclusionary requirements and fee levels that are proportionate to the impact that new market rate residential development has on the need for affordable housing.

The City's Draft Housing Oahu: Islandwide Housing Strategy proposes that a new inclusionary housing requirement be considered as one of many strategies to produce affordable housing islandwide. Under the strategy's proposed requirements, residential projects with 10 or more units would be required to set-aside a percentage of units as affordable, construct units offsite, or pay a fee in-lieu of providing units. This analysis is intended to provide information to assist in the design of proposed requirements by identifying a set of affordable housing requirements that are proportionate to the impact new market rate residential development has on the need for affordable housing and which are reflective of the affordable housing needs of workers employed in services to new market rate residential development.

The Nexus Concept

At its most simplified level, the underlying nexus concept is that the newly constructed units represent net new households in Honolulu. These households represent new income in Honolulu that will consume goods and services, either through purchases of goods and services or "consumption" of governmental services. New consumption translates to jobs; a portion of the jobs are at lower compensation levels; low compensation jobs relate to lower income households that cannot afford market rate units in Honolulu and therefore need affordable housing.

Purpose and Use of This Study

The City and County of Honolulu requested this Residential Nexus Analysis in conjunction with the consideration of potential inclusionary requirements applicable to new residential development as a component of the proposed Housing Oahu: Islandwide Housing Strategy. The purpose of this Residential Nexus Analysis is to provide information about the impact that new residential development has on the need for affordable housing and determine inclusionary housing percentage and in-lieu fee requirements proportionate to these impacts and which are sufficient to mitigate them. We caution against the use of this study, or any impact study for that matter, for purposes beyond the intended use. All impact studies are limited and imperfect, but can be helpful for understanding the externalities created by new development. The nexus analysis presented in this report is an impact analysis only and the nexus amounts are not recommended requirements.

Methodology and Models Used

The methodology or analysis procedure for this nexus analysis starts with the sales price or rental rate of a new market rate residential unit, and moves through a series of linkages to the gross income of the household that purchased or rented the unit, the income available for expenditures on goods and services, the jobs associated with the purchases and delivery of those services, the income of the workers doing those jobs, the household income of the workers and, ultimately, the affordability level of the housing needed by the worker households. The steps of the analysis from household income available for expenditures to jobs generated were performed using the IMPLAN model, a model widely used for the past 35 years to quantify the impacts of changes in a local economy, including employment impacts from changes in personal income. From job generation by industry, KMA used its own jobs housing nexus model to quantify the income of worker households by affordability level.

To illustrate the linkages by looking at a simplified example, we can take an average household that buys a house at a certain price. From that price, we estimate the gross income of the household (from mortgage rates and lending practices) and the portion of income available for expenditures. Households will “purchase” or consume a range of goods and services, such as purchases at the supermarket or services at the bank. Purchases in the local economy in turn generate employment. The jobs generated are at different compensation levels. Some of the jobs are low paying and as a result, even when there is more than one worker in the household, there are some lower and middle-income households who cannot afford market rate housing in Honolulu.

The IMPLAN model quantifies jobs generated at establishments that serve new residents directly (e.g., supermarkets, banks or schools), jobs generated by increased demand at firms which service or supply these establishments, and jobs generated when the new employees spend their wages in the local economy and generate additional jobs. The IMPLAN model estimates the total impact combined.

Net New Underlying Assumption

An underlying assumption of the analysis is that households that purchase or rent new units represent net new households in Honolulu. If purchasers or renters have relocated from elsewhere in Honolulu, vacancies have been created that will be filled. An adjustment to new construction of units would be warranted if Honolulu were experiencing demolitions or loss of existing housing inventory. However, the rate of housing unit removal is so low as to not warrant an adjustment or offset. On an individual project basis, if existing units are removed to redevelop a site to higher density, then there could be a need for recognition of the existing households in that all new units might not represent net new households, depending on the program design and number of units removed relative to new units.

The nexus does not make the argument that construction of new units is solely responsible for population and household growth. Household growth in Honolulu occurs through a combination of natural increases in population and relocations from off-island. Construction of new residential units is a major contributing cause to population and household growth because without new housing supply, population and household growth would not continue to occur over a sustained period. In the short-term, population growth may occur without additions to the housing supply through accommodating additional people within the existing housing stock. However, over the long-term, households would not continue to relocate to Honolulu from off-island if they could not find adequate housing available. Without construction of new housing, out-migration could also become more of a factor offsetting natural increases in population as households seek places where housing is more available. Families may also respond to a lack of adequate housing by delaying childbearing or having fewer children.

Since the analysis addresses net new households in Honolulu and the impacts generated by their consumption expenditures, it quantifies net new demands for affordable units to accommodate new worker households. As such, the impact results do not address nor in any way include existing deficiencies in the supply of affordable housing.

Geographic Area of Impact

The analysis quantifies impacts occurring within the City and County of Honolulu. The majority of jobs related to services to new households are anticipated to be located on Oahu. The IMPLAN model computes the jobs generated in Honolulu / the island of Oahu and sorts out any jobs located off-island. The KMA Jobs Housing Nexus Model is then used to analyze the income structure of the jobs and their worker households. In summary, the KMA nexus analysis quantifies all job impacts occurring within Honolulu and related worker households.

Market Rate Residential Project Types

Five prototypical residential project types were selected for analysis in this nexus study. The prototypes were intended to represent the range of product types currently being built in Honolulu or which are expected in the future including:

- Single Family
- Low-Rise Townhomes²
- Mid-Rise Condo
- High-Rise Condo (PUC)
- Rental Apartments

² The Townhome prototype is typically all wood frame construction and can include conventional townhomes and other similar all wood frame prototypes such as stacked flats.

Affordability Tiers

The nexus analysis addresses the following five income or affordability tiers:

- Extremely Low Income (under 30% of Area Median Income or AMI)
- Very Low Income (30% to 50% AMI)
- Low Income (50% to 80% AMI)
- Moderate (80% to 120% AMI)
- 140% AMI Tier (120% to 140% AMI)

The analysis includes the 140% AMI Tier representing households from 120% - 140% of AMI given that Honolulu's existing unilateral agreement rules address housing needs up to 140% of AMI.

Report Organization

The report is organized into four sections as follows:

- Section A. presents information regarding the prototypical new market rate residential units and the estimated household income of purchases or renters of those units.
- Section B. describes the IMPLAN model which is used in the nexus analysis to translate household income into the estimated number of jobs in retail, restaurants, healthcare, and other sectors serving new residents.
- Section C. presents the linkage between employment growth associated with residential development and the need for new lower income housing units required in each of five income categories.
- Section D. quantifies the nexus or mitigation cost based on the cost of delivering affordable units to new worker households in each of the five lower income categories.

III. NEXUS ANALYSIS

A. MARKET RATE UNITS AND HOUSEHOLD INCOME

This section describes the prototypical market rate residential units and the income of the purchaser and renter households. Market rate prototypes are representative of new residential units currently being built in Honolulu or that are likely to be built in Honolulu over the next several years. Household income is estimated based on the amount necessary for the mortgage or rent payments associated with the prototypical new market rate units and becomes the basis for the input to the IMPLAN model described in Section B of this report. These are the starting points of the chain of linkages that connect new market rate units to incremental demand for affordable residential units.

This section provides a summary of the prototypes and household income. More description and supporting tables are provided in Appendix 1.

Recent Housing Market Activity and Prototypical Units

KMA identified five residential prototypes in consultation with City staff; these prototypes are representative of the types of development that are being built in Honolulu today and expected to be built in the coming years. KMA then undertook a market survey of new construction projects covering these prototypes in fall 2014, as well as obtained data on sales of existing homes in Honolulu, focusing on units built since 1990. Further discussion of the market survey is included in Appendix 1.

The results of the market survey and the selection of five prototypes are summarized in the table below. The main objective of the survey was to establish current sales prices or rents per unit and per square foot for the various residential project types recently developed, or expected to be developed in the future, in Honolulu. Table A-1 at the end of this section provides a more detailed summary of the five market rate prototypes.

It is important to note that the prototypes analysis is intended to reflect average or typical residential projects in the Honolulu market rather than any specific project. It would be expected that specific projects would vary to some degree from the prototypes.

In summary, the prototypes tested in the nexus analysis are as follows:

Prototypical Residential Units					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Avg. Unit Size	1,700 SF	1,200 SF	1,000 SF	1,000 SF	900 SF
Avg. Sales Price / Rent	\$700,000	\$575,000	\$525,000	\$700,000	\$2,500 /mo.

Income of Housing Unit Purchaser or Renter

After the prototypes are established, the next step in the analysis is to determine the income of the purchasing or renting households in the prototypical units.

Ownership Units

To make the determination for ownership units, terms for the purchase of residential units used in the analysis are slightly less favorable than what can be achieved at the current time since current terms are not likely to endure. The selected terms for the analysis are: 20% down payment, 30 year fixed rate mortgage, 5.5% interest rate. The assumption of a 20% down payment is based on the median for purchase loans in Honolulu³. The interest rate at 5.5% reflects an estimate of the longer term average based on the experience over the past fifteen years.⁴ Tables A-2 through A-5 at the end of this section provide the details.

All ownership product types include an estimate of homeowners' insurance, homeowner association dues, and property taxes which are included along with the mortgage payment as part of housing expenses for purposes of determining mortgage eligibility⁵.

Incomes for households in the prototypical market rate units is estimated based on the amount necessary to afford mortgage payments and other housing costs. Data from Freddie Mac on the average "debt to income ratio" for new purchase mortgage loans originated in Honolulu of 37% is used to make the calculation. The 37% debt to income ratio means that housing costs, along with other debt, represent an average of 37% of household income⁶.

Apartment Units

Household income for renter households is estimated based on the assumption that rent represents, on average, 30% of gross household income. The 30% factor was selected as it is widely used as a standard for relating income to affordable rent levels including by the U.S. Department of Housing and Urban Development. Selection of 30% represents a conservative

³ Median down payment at 20% is based on Freddie Mac data on its portfolio of mortgages within zip codes corresponding to Honolulu and is specific to principal residence purchase loans originated during the 2nd quarter of 2013, the most recent period available at the time the data was accessed.

⁴ Based on Freddie Mac Primary Mortgage Market Survey weekly average rates for 30 year fixed rate mortgages during the period from September 1999 through September 2014.

⁵ Housing expenses are combined with other debt payments such as credit cards and auto loans to compute a Debt To Income (DTI) ratio which is a key criteria used for determining mortgage eligibility.

⁶ New purchase loans in Honolulu have an average debt to income ratio of 37% based on data from Freddie Mac on its portfolio of mortgages within zip codes corresponding to Honolulu and specific to principal residence purchase loans originated during 2nd quarter of 2013, the most recent period available at the time the data was accessed. Debt to income ratio includes other forms of debt such as student loans, credit cards, and auto loans which suggests a ratio including only housing expenses would be less than 37%. Applying a ratio below 37% in the analysis would have produced a higher estimate of gross household income and higher resulting nexus findings; therefore, application of a 37% ratio represents a conservative assumption for purposes of the nexus analysis.

approach for purposes of the nexus analysis because it produces a lower estimate of gross household income and lower resulting nexus conclusions than if the Census average of 16% of income spent on rent for renter households earning \$100,000 and above were applied, the income category applicable to households in the prototypical new market rate rental units. While leasing agents and landlords may permit rental payments to represent a slightly higher share of total income, use of the 30% factor, which is representative of the average, is appropriate. Further, many renters will choose to spend less than 30% of their income on rent where possible, since, unlike an ownership situation, the unit is not viewed as an investment with value enhancement potential. The resulting relationship is that annual household income is 3.3 times annual rent.

The estimated gross household incomes of the purchasers or renters of the prototype units are calculated in tables A-2 through A-6, and summarized below.

Household Income					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Gross Household Income	\$115,000	\$101,000	\$95,000	\$127,000	\$100,000

Income Available for Expenditures

The input into the IMPLAN model used in this analysis is the net income available for expenditures. To arrive at income available for expenditures, gross income must be adjusted for Federal and State income taxes, contributions to Social Security and Medicare, savings, and payments on household debt. Per KMA correspondence with the producers of the IMPLAN model (IMPLAN Group LLC), other taxes including sales tax, gas tax, and property tax are handled internally within the model as part of the analysis of expenditures. Housing costs are addressed separately, as described below, and so are not deducted as part of this adjustment step. Table A-7 at the end of this section shows the calculation of income available for expenditures.

Income available for expenditures ranges from 67% to 72% of gross income for the ownership housing prototypes. The estimate is based on a review of data from the Internal Revenue Service and State of Hawaii Department of Taxation tax tables. Residents of the Single Family and High-rise Condo prototypes are estimated to pay an average of 12.4% of gross income in federal taxes based on data from the Internal Revenue Service applicable to households earning between \$100,000 and \$200,000 per year. Residents of the townhome and mid-rise condo prototypes are estimated to pay 8.8% of their income toward federal taxes, which is the average for households in the \$75,000 to \$100,000 income range⁷. State taxes are estimated to average 4% to 6% of gross income based on tax rates per the State of Hawaii Department of

⁷ Average tax rate for the \$75,000 to \$100,000 income range was applied to the townhome prototype despite estimated income slightly above \$100,000 because the \$75,000 to \$100,000 range is likely more representative than the \$100,000 to \$200,000 category which covers a much broader range of incomes.

Taxation. The employee share of FICA payroll taxes for Social Security and Medicare is 7.65% of gross income (conservatively assumes all earners in the household are within the \$118,500 ceiling on income subject to Social Security taxes).

Savings and repayment of household debt represent another necessary adjustment to gross income. Savings includes various IRA and 401 K type programs as well as non-retirement household savings and investments. Debt repayment includes auto loans, credit cards, and all other non-mortgage debt. Savings and repayment of debt are estimated to represent a combined 8% of gross income based on the 20 year average derived from United States Bureau of Economic Analysis data.

The percentage of income available for expenditure for input into the IMPLAN model is prior to deducting housing costs. The reason is for consistency with the IMPLAN model which defines housing costs as expenditures. The IMPLAN model addresses the fact that expenditures on housing do not generate employment to the degree other expenditures such as retail or restaurants do, but there is some limited maintenance and property management employment generated.

After deducting income taxes, Social Security, Medicare, savings, and repayment of debt, for purchasers of one of the new ownership prototypes, the estimated income available for expenditures ranges from 67% for the Single Family prototype to 72% for the mid-rise condo prototype. This is the factor used to adjust from gross income to the income available for expenditures. As indicated above, other forms of taxation such as property tax are handled internally within the IMPLAN model.

Income available for expenditures for the prototypical renter household is based on the same evaluation, but a higher tax rate applies to a renter household. Renter households are assumed to pay higher average income tax rates because many renter households will not have the ability to itemize deductions on income tax returns without mortgage interest and real estate taxes to deduct. The result is that the renter household would have an estimated 65% of income available for expenditures. The rate of savings and debt repayment is assumed to be the same for the renter household as for households in the ownership prototypes.

Another adjustment made to spending is to account for the use of a share of units as second homes which may be occupied for only a portion of the year. The adjustment is made using U.S. census data for Honolulu on the percentage of single family and multifamily units that are used as second homes. Household expenditures for single family homes are reduced by 1% on average, to account for the fact that some units may be used as second homes and left vacant part of the year. A 4% reduction to expenditures for the townhome and condo prototypes is made based on Census data for multifamily units in Honolulu which have a higher incidence of second home owners who do not occupy the unit year-round. For the apartment prototype, we apply a 5% adjustment for standard operational vacancy.

Estimates of household income available for expenditures are presented in the following table:

Household Income Available for Expenditure					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Gross Household Income	\$115,000	\$101,000	\$95,000	\$127,000	\$100,000
Percent Income available for Expenditures	67%	71%	72%	67%	65%
Spending adjustment for vacancy/ 2 nd homes occupied part of year	99%	96%	96%	96%	95%
Household Income Available for Expenditures [Input to IMPLAN model]	\$76,300	\$68,800	\$65,700	\$81,700	\$61,800

The nexus analysis is conducted on 100-unit building modules for ease of presentation, and to avoid awkward fractions. Tables A-8 and A-9 summarize the conclusions of this section and calculate the household income for the 100-unit building modules. This is the input into the IMPLAN model.

TABLE A-1
SUMMARY OF MARKET RATE RESIDENTIAL PROTOTYPES
RESIDENTIAL NEXUS ANALYSIS
CITY AND COUNTY OF HONOLULU

	For-Sale Prototypes				Rental
	Prototype 1	Prototype 2	Prototype 3	Prototype 4	Prototype 5
	Detached Homes	Townhomes	Mid-Rise Condos	(PUC)	Apartments
Average Unit Size	1,700 sf	1,200 sf	1,000 sf	1,000 sf	900 sf
Market Rate Price/Rent	\$700,000	\$575,000	\$525,000	\$700,000	\$2,500 /mo.
\$/SF	\$412 /sf	\$479 /sf	\$525 /sf	\$700 /sf	\$2.78 /sf

Source: Pricing estimated by KMA based on market survey

**TABLE A-2
 PROTOTYPE 1: SINGLE FAMILY
 SALES PRICE TO INCOME RATIO
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI**

		Prototype 1 Single Family
Sales Price	\$412 /SF 1,700 SF ¹	\$700,000 ¹
Mortgage Payment		
Downpayment @ 20%	20% ²	\$140,000
Loan Amount		\$560,000
Interest Rate		5.50% ³
Term of Mortgage		30 years
Annual Mortgage Payment		\$38,200
Other Costs		
Property Taxes	0.31% of sales price ⁴	\$2,200
HOA Dues / Maintenance	\$100 per month ⁵	\$1,200
Homeowner Insurance	0.15% sale price ⁶	\$1,100
Total Annual Housing Cost		<u>\$42,700</u>
% of Income Spent on Hsg		37% ⁷
Annual Household Income Required		\$115,000
Sales Price to Income Ratio		6.1

Notes

(1) Based on Market Survey.

(2) Median down payment at 20% is based on Freddie Mac data on its portfolio of mortgages within zip codes corresponding to Honolulu and specific to principal residence purchase loans originated during 2nd quarter of 2013 (most recent available).

(3) Average interest rate for 30-year fixed rate mortgage over the past 15 years derived from Freddie Mac Primary Mortgage Market Survey (rounded down from average of 5.66%).

(4) Effective tax rate assuming home exemption applies.

(5) HOA dues for newer single family units are estimated at \$100 based on projects covered in market survey which have HOA dues ranging from \$0 to \$257/mo.

(6) Estimated from quote obtained from Liberty Mutual Insurance.

(7) Based on Freddie Mac data on mortgages originated in Honolulu which reflect an average debt to income ratio of 37% including both housing expenses and other debt like auto loans and credit cards. Were other debt excluded, the ratio would be lower than 37%. Using a ratio of 37% produces conservative nexus results that are understated compared to results that would be produced using a lower ratio.

**TABLE A-3
 PROTOTYPE 2: LOW-RISE TOWNHOMES
 SALES PRICE TO INCOME RATIO
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI**

			Prototype 2 Low-Rise Townhomes
Sales Price	\$479 /SF	1,200 SF ¹	\$575,000 ¹
Mortgage Payment			
Downpayment @ 20%		20% ²	\$115,000
Loan Amount			\$460,000
Interest Rate			5.50% ³
Term of Mortgage			30 years
Annual Mortgage Payment			\$31,300
Other Costs			
Property Taxes	0.30% of sales price ⁴		\$1,700
HOA Dues / Maintenance	\$300 per month ⁵		\$3,600
Homeowner Insurance	0.15% sale price ⁶		\$900
Total Annual Housing Cost			\$37,500
% of Income Spent on Hsg			37% ⁷
Annual Household Income Required			\$101,000
Sales Price to Income Ratio			5.7

Notes

(1) Based on Market Survey.

(2) Median down payment at 20% is based on Freddie Mac data on its portfolio of mortgages within zip codes corresponding to Honolulu and specific to principal residence purchase loans originated during 2nd quarter of 2013 (most recent available).

(3) Average interest rate for 30-year fixed rate mortgage over the past 15 years derived from Freddie Mac Primary Mortgage Market Survey (rounded down from average of 5.66%).

(4) Effective tax rate assuming home exemption applies.

(5) Estimated based on review of HOA dues for townhome resale listings and new townhomes identified in market survey.

(6) Estimated from quote obtained from Liberty Mutual Insurance.

(7) Based on Freddie Mac data on mortgages originated in Honolulu which reflect an average debt to income ratio of 37% including both housing expenses and other debt like auto loans and credit cards. Were other debt excluded, the ratio would be lower than 37%. Using a ratio of 37% produces conservative nexus results that are understated compared to results that would be produced using a lower ratio.

**TABLE A-4
 PROTOTYPE 3: MID-RISE CONDO
 SALES PRICE TO INCOME RATIO
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI**

			Prototype 3 Mid-Rise Condo
Sales Price	\$525 /SF	1,000 SF ¹	\$525,000 ¹
Mortgage Payment			
Downpayment @ 20%		20% ²	\$105,000
Loan Amount			\$420,000
Interest Rate			5.50% ³
Term of Mortgage			30 years
Annual Mortgage Payment			\$28,600
Other Costs			
Property Taxes	0.30% of sales price ⁴		\$1,600
HOA Dues / Maintenance	\$350 per month ⁵		\$4,200
Homeowner Insurance	0.15% sale price ⁶		\$800
Total Annual Housing Cost			\$35,200
% of Income Spent on Hsg			37% ⁷
Annual Household Income Required			\$95,000
Sales Price to Income Ratio			5.5

Notes

(1) Based on Market Survey.

(2) Median down payment at 20% is based on Freddie Mac data on its portfolio of mortgages within zip codes corresponding to Honolulu and specific to principal residence purchase loans originated during 2nd quarter of 2013 (most recent available).

(3) Average interest rate for 30-year fixed rate mortgage over the past 15 years derived from Freddie Mac Primary Mortgage Market Survey (rounded down from average of 5.66%).

(4) Effective tax rate assuming home exemption applies.

(5) Estimated based on review of HOA dues for condo resale listings and condos identified in market survey.

(6) Estimated from quote obtained from Liberty Mutual Insurance.

(7) Based on Freddie Mac data on mortgages originated in Honolulu which reflect an average debt to income ratio of 37% including both housing expenses and other debt like auto loans and credit cards. Were other debt excluded, the ratio would be lower than 37%. Using a ratio of 37% produces conservative nexus results that are understated compared to results that would be produced using a lower ratio.

TABLE A-5
PROTOTYPE 4: HIGH-RISE CONDO (PUC)
SALES PRICE TO INCOME RATIO
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI

		Prototype 4 High-Rise Condo (PUC)	
Sales Price	\$700 /SF	1,000 SF ¹	\$700,000 ¹
Mortgage Payment			
Downpayment @ 20%		20% ²	\$140,000
Loan Amount			\$560,000
Interest Rate			5.50% ³
Term of Mortgage			30 years
Annual Mortgage Payment			\$38,200
Other Costs			
Property Taxes	0.31% of sales price ⁴		\$2,200
HOA Dues / Maintenance	\$450 per month ⁵		\$5,400
Homeowner Insurance	0.15% sale price ⁶		\$1,100
Total Annual Housing Cost			\$46,900
% of Income Spent on Hsg			37% ⁷
Annual Income Required			\$127,000
Sales Price to Income Ratio			5.5

Notes

(1) Based on Market Survey.

(2) Median down payment at 20% is based on Freddie Mac data on its portfolio of mortgages within zip codes corresponding to Honolulu and specific to principal residence purchase loans originated during 2nd quarter of 2013 (most recent available).

(3) Average interest rate for 30-year fixed rate mortgage over the past 15 years derived from Freddie Mac Primary Mortgage Market Survey (rounded down from average of 5.66%).

(4) Effective tax rate assuming home exemption applies.

(5) Based on HOA dues for high-rise condo units in Honolulu from the Market Survey.

(6) Estimated from quote obtained from Liberty Mutual Insurance.

(7) Based on Freddie Mac data on mortgages originated in Honolulu which reflect an average debt to income ratio of 37% including both housing expenses and other debt like auto loans and credit cards. Were other debt excluded, the ratio would be lower than 37%. Using a ratio of 37% produces conservative nexus results that are understated compared to results that would be produced using a lower ratio.

**TABLE A-6
 PROTOTYPE 5: RENTAL APARTMENT
 RENT TO INCOME RATIO
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI**

			<u>Prototype 5 Rental Apartment</u>
Market Rent			
Monthly	\$2.78 /SF	900 SF ¹	\$2,500 ¹
Annual			\$30,000
% of Income Spent on Rent (excludes utilities)			30% ²
Annual Household Income Required			\$100,000
Annual Rent to Income Ratio			3.3

Notes

(1) Based on the results of the market survey. Represents rent levels applicable to new units.

(2) Renter households are assumed to spend 30% of income on rent. The 30% figure is selected based on its frequent use in housing policy. While Census data for Honolulu indicates only 16% of households earning \$100,000 or above spend 30% or more of their income on rent, 30% produces results that are conservative or understated as compared to those that would be produced by selection of a lower figure.

**TABLE A-7
INCOME AVAILABLE FOR EXPENDITURES¹
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

	Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Gross Income	100%	100%	100%	100%	100%
<u>Less:</u>					
Federal Income Taxes ²	12.4%	8.8%	8.8%	12.4%	12.9%
State Income Taxes ³	5%	5%	4%	5%	6%
FICA Tax Rate ⁴	7.65%	7.65%	7.65%	7.65%	7.65%
Savings & other deductions ⁵	8%	8%	8%	8%	8%
Percent of Income Available for Expenditures⁶ [Input to IMPLAN model]	67%	71%	72%	67%	65%

Notes:

- ¹ Gross income after deduction of taxes and savings. Income available for expenditures is the input to the IMPLAN model which is used to estimate the resulting employment impacts. Housing costs are not deducted as part of this adjustment step because they are addressed separately as expenditures within the IMPLAN model.
- ² Reflects average tax rates (as opposed to marginal) applicable to estimated household incomes from tables A-2 to A-6 based on U.S. Internal Revenue Services, Tax Statistics, Tables 1.4 and 2.1. Figures are for the 2012 tax year, the most recent for which data is available. Homeowners are assumed to itemize deductions. Renters are assumed to take the standard deduction.
- ³ Average tax rates applicable to estimated household incomes from tables A-2 to A-6 estimated by KMA based on marginal rates per the State of Hawaii Department of Taxation and ratios of taxable income to gross income estimated based on U.S. Internal Revenue Service data. The higher average tax rates applicable to single or married filing separately tax filers is applied in the analysis so as to produce a conservative (likely understated) estimate.
- ⁴ For Social Security and Medicare. Conservatively assumes all income will be subject to Social Security taxes. The current ceiling on applicability of Social Security taxes is \$118,500 (ceiling applies per earner not per household).
- ⁵ Household savings including retirement accounts like 401k / IRA and other deductions such as interest costs on credit cards, auto loans, etc, necessary to determine the amount of income available for expenditures. The 8% rate used in the analysis is based on the average over the past 20 years computed from U.S. Bureau of Economic Analysis data, specifically the National Income and Product Accounts, Table 2.1 "Personal Income and It's Disposition."
- ⁶ Deductions from gross income to arrive at the net income available for expenditures are consistent with the way the IMPLAN model and National Income and Product Accounts (NIPA) defines income available for personal consumption expenditures. Deductions include income taxes, contributions to Social Security and Medicare, savings and household debt. The income available for expenditures does not reflect deductions for items accounted for as expenditures within the IMPLAN model itself including property taxes, sales taxes and housing expenditures based on guidance from IMPLAN.

**TABLE A-8
FOR SALE PROTOTYPES: SALES PRICE TO INCOME SUMMARY
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

		Per Unit	Per Sq.Ft.	100 Unit Building Module
<i>Page 1 of 2</i>				
PROTOTYPE 1: SINGLE FAMILY				
Units				100 Units
Building Sq.Ft. (net salable area)		1,700		170,000
Sales Price		\$700,000	\$412	\$70,000,000
Sales Price to Income Ratio		6.1		6.1
Gross Household Income		\$115,000		\$11,500,000
Income Available for Expenditure ¹	67% of gross	\$77,000		\$7,710,000
Adjusted Expenditures / Second Homes ²	1% adjustment			\$7,630,000
PROTOTYPE 2: LOW-RISE TOWNHOMES				
Units				100 Units
Building Sq.Ft. (net salable area)		1,200		120,000
Sales Price		\$575,000	\$479	\$57,500,000
Sales Price to Income Ratio		5.7		5.7
Gross Household Income		\$101,000		\$10,100,000
Income Available for Expenditure ¹	71% of gross	\$72,000		\$7,170,000
Adjusted Expenditures / Second Homes ²	4% adjustment			\$6,880,000

**TABLE A-8
FOR SALE PROTOTYPES: SALES PRICE TO INCOME SUMMARY
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

		Per Unit	Per Sq.Ft.	100 Unit Building Module
<i>Page 2 of 2</i>				
PROTOTYPE 3: MID-RISE CONDO				
Units				100 Units
Building Sq.Ft. (net salable area)		1,000		100,000
Sales Price		\$525,000	\$525	\$52,500,000
Sales Price to Income Ratio		5.5		5.5
Gross Household Income		\$95,000		\$9,500,000
Income Available for Expenditure ¹	72% of gross	\$68,000		\$6,840,000
Adjusted Expenditures / Second Homes ²	4% adjustment			\$6,570,000
PROTOTYPE 4: HIGH-RISE CONDO (PUC)				
Units				100 Units
Building Sq.Ft. (net salable area)		1,000		100,000
Sales Price		\$700,000	\$700	\$70,000,000
Sales Price to Income Ratio		5.5		5.5
Gross Household Income		\$127,000		\$12,700,000
Income Available for Expenditure ¹	67% of gross	\$85,000		\$8,510,000
Adjusted Expenditures / Second Homes ²	4% adjustment			\$8,170,000

Notes:

(1) Represents net income available for expenditures after income tax, payroll taxes, and savings. See Table A-8 for derivation.

(2) Adjustment to expenditures based upon the expectation that a share of units may not be occupied year round because they are second homes. The adjustment is based upon American Community Survey data for Honolulu which identifies the portion of single family and multifamily units used as seasonal or vacation homes. Data is for 2005, the most recent period in which the breakout between single family and multifamily units used as vacation homes is provided. Second homes are assumed to be in use three months of the year.

Source: See Tables A-2 to A-5.

Prepared by: Keyser Marston Associates, Inc.

\\Sf-fs2\wp\14\14100\002\Honolulu Nexus model 8-31-15; 8/31/2015; dd

**TABLE A-9
NEW MARKET RATE RESIDENTIAL HOUSEHOLD SUMMARY
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

		<u>Per Unit</u>	<u>Per Sq.Ft.</u>	<u>100 Unit Building Module</u>
PROTOTYPE 5: RENTAL APARTMENT				
Units				100 Units
Building Sq.Ft. (net rentable area)		900		90,000
Rent				
Monthly		\$2,500	\$2.78 /SF	\$250,000
Annual		\$30,000	\$33.36 /SF	\$3,000,000
Rent to Income Ratio		3.3		3.3
Gross Household Income		\$100,000		\$10,000,000
Income Available for Expenditure ¹	65% of gross	\$65,000		\$6,500,000
Expenditures adjusted for vacancy ²	5% vacancy	\$62,000		\$6,180,000

Notes:

(1) Represents net income available for expenditures after income tax, payroll taxes, and savings. See Table A-8 for derivation.

(2) Adjustment to expenditures to account for standard operational vacancy. Vacancy rates consistent with current figures for Honolulu based on the 2011-2013 American Community Survey.

Source: Table A-6 .

B. THE IMPLAN MODEL

Consumer spending by residents of new housing units will create jobs, particularly in sectors such as restaurants, health care, and retail, which are closely connected to the expenditures of residents. The widely used economic analysis tool, IMPLAN (IMpact Analysis for PLANning), was used to quantify these new jobs by industry sector.

IMPLAN Model Description

The IMPLAN model is an economic analysis software package now commercially available through the IMPLAN Group, LLC. IMPLAN was originally developed by the U.S. Forest Service, the Federal Emergency Management Agency, and the U.S. Department of the Interior Bureau of Land Management and has been in use since 1979 and refined over time. It has become a widely used tool for analyzing economic impacts for a broad range of applications from major construction projects to natural resource programs.

IMPLAN is based on an input-output accounting of commodity flows within an economy from producers to intermediate and final consumers. The model establishes a matrix of supply chain relationships between industries and also between households and the producers of household goods and services. Assumptions about the portion of inputs or supplies for a given industry likely to be met by local suppliers, and the portion supplied from outside the region or study area are derived internally within the model using data on the industrial structure of the region.

The output or result of the model is generated by tracking changes in purchases for final use (final demand) as they filter through the supply chain. Industries that produce goods and services for final demand or consumption must purchase inputs from other producers, which in turn, purchase goods and services. The model tracks these relationships through the economy to the point where leakages from the region stop the cycle. This allows the user to identify how a change in demand for one industry will affect a list of over 400 other industry sectors. The projected response of an economy to a change in final demand can be viewed in terms of economic output, employment, or income.

Data sets are available for each county and state, so the model can be tailored to the specific economic conditions of the region being analyzed. This analysis utilizes the 2012 IMPLAN data set for Honolulu which was released in December 2013. As will be discussed, much of the employment impact is in local-serving sectors, such as retail, eating and drinking establishments, and medical services. The vast majority of these jobs are expected to be located in Honolulu as most services to Honolulu residents cannot be readily provided from off-shore. Employment estimates from the IMPLAN model represents employment in Honolulu.

Application of the IMPLAN Model to Estimate Job Growth

The IMPLAN model was applied to link income to household expenditures to job growth. Employment generated by the household income of residents is analyzed in modules of 100 residential units to simplify communication of the results and avoid awkward fractions. The IMPLAN model distributes spending among various types of goods and services (industry sectors) based on data from the Consumer Expenditure Survey and the Bureau of Economic Analysis Benchmark input-output study, to estimate employment generated.

Job creation, driven by increased demand for products and services, was projected for each of the industries that will serve the new households. The employment generated by this new household spending is summarized below.

Jobs Generated Per 100 Units					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Annual Household Expenditures, 100 Units	\$7,630,000	\$6,880,000	\$6,570,000	\$8,170,000	\$6,180,000
Total Jobs Generated, 100 Units	67.1	60.5	55.7	71.8	54.3

Table B-1 provides a detailed summary of employment generated by industry. The table shows industries sorted by projected employment. The Consumer Expenditure Survey published by the Bureau of Labor Statistics tracks expenditure patterns by income level. IMPLAN utilizes this data to reflect the pattern by income bracket. In the case of the Honolulu prototypes, the mid-rise condo is in the \$75,000 to \$100,000 category while all other prototypes fall into the \$100,000 to \$150,000 income category. Estimated employment is shown for each IMPLAN industry sector representing 1% or more of total employment. The jobs that are generated are heavily retail jobs, jobs in restaurants and other eating establishments, and in services that are provided locally such as health care. The jobs counted in the IMPLAN model cover all jobs, full and part time, similar to the U.S. Census and all reporting agencies (unless otherwise indicated).

TABLE B-1
IMPLAN MODEL OUTPUT
EMPLOYMENT GENERATED
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI

Per 100 Market Rate Units

	Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment	% of Jobs
Household Expenditures (100 Market Rate Units) ¹	\$7,630,000	\$6,880,000	\$6,570,000	\$8,170,000	\$6,180,000	
Jobs Generated by Industry ²						
Retail Stores - Food and beverage	2.4	2.2	1.9	2.6	2.0	4%
Retail Stores - General merchandise	2.3	2.1	1.7	2.4	1.8	3%
Retail Stores - Motor vehicle and parts	1.3	1.2	1.0	1.4	1.1	2%
Retail Stores - Clothing and accessories	1.2	1.1	0.9	1.3	1.0	2%
Retail Stores - Miscellaneous	1.1	1.0	0.8	1.2	0.9	2%
Retail Stores - Health and personal care	1.0	0.9	0.7	1.0	0.8	1%
Retail Stores - Sporting goods, book, music	0.6	0.5	0.4	0.6	0.5	1%
Retail Stores - Building and garden supply	0.5	0.5	0.4	0.6	0.4	1%
Retail Stores - Electronics and appliances	0.4	0.3	0.3	0.4	0.3	1%
Retail Stores - Gasoline stations	0.3	0.3	0.2	0.3	0.3	0%
Retail Stores - Furniture and home furnishings	<u>0.3</u>	<u>0.2</u>	<u>0.2</u>	<u>0.3</u>	<u>0.2</u>	<u>0%</u>
Subtotal Retail	11.3	10.2	8.6	12.1	9.1	17%
Offices of physicians and dentists	3.8	3.4	3.3	4.1	3.1	6%
Private hospitals	3.1	2.8	2.8	3.3	2.5	5%
Home health care services	0.8	0.7	0.7	0.8	0.6	1%
Nursing and residential care facilities	1.8	1.6	1.6	1.9	1.5	3%
Medical and diagnostic labs and outpatient care	<u>1.1</u>	<u>1.0</u>	<u>0.9</u>	<u>1.1</u>	<u>0.9</u>	<u>2%</u>
Subtotal Health Care	10.6	9.5	9.3	11.3	8.5	16%
Food services and drinking places	7.9	7.1	6.7	8.5	6.4	12%
Real estate including property management	2.3	2.0	2.4	2.4	1.8	3%
Private household operations	2.0	1.8	1.7	2.2	1.7	3%
Wholesale trade businesses	2.0	1.8	2.2	2.2	1.6	3%
Individual and family services	1.5	1.4	1.2	1.6	1.2	2%
Employment services	1.3	1.2	1.1	1.4	1.0	2%
Civic, social, professional organizations	1.3	1.1	1.0	1.4	1.0	2%
Banking and depository credit	1.1	1.0	0.9	1.2	0.9	2%
Insurance carriers	1.1	1.0	0.9	1.2	0.9	2%
Services to buildings and dwellings	1.1	1.0	0.9	1.1	0.9	2%
Securities, investments, and related	1.0	0.9	0.8	1.1	0.8	2%
Child day care services	1.0	0.9	0.7	1.1	0.8	2%
Elementary and secondary schools	1.0	0.9	0.7	1.0	0.8	1%
Personal care services	0.9	0.8	0.8	1.0	0.8	1%
Other private educational services	0.9	0.8	0.6	1.0	0.7	1%
Colleges, universities, and professional schools	0.8	0.8	0.6	0.9	0.7	1%
Amusement parks, arcades, and gambling industries	0.8	0.7	0.6	0.8	0.6	1%
Legal services	0.7	0.7	0.6	0.8	0.6	1%
Automotive repair and maintenance	0.6	0.6	0.5	0.7	0.5	1%
All Other	15.8	14.2	13.0	16.9	12.8	24%
Total Number of Jobs Generated	67.1	60.5	55.7	71.8	54.3	100%

¹ Estimated employment generated by expenditures of households within 100 prototypical market rate units. Employment estimates are based on the IMPLAN Group's economic model, IMPLAN, for Honolulu.

² For Industries representing more than 1% of total employment.

C. THE KMA JOBS HOUSING NEXUS MODEL

This section presents a summary of the analysis linking the employment growth associated with residential development, or the output of the IMPLAN model (see Section B), to the estimated number of lower income housing units required in each of five income categories, for each of the five residential prototype units.

Analysis Approach and Framework

The analysis approach is to examine the employment growth for industries related to consumer spending by residents in the 100-unit modules. Then, through a series of linkage steps, the number of employees is converted to households and housing units by affordability level. The findings are expressed in terms of numbers of affordable units per 100 market rate units.

The analysis addresses the affordable unit demand associated with single family, low-rise townhomes, mid-rise condos, high-rise condos and rental units in Honolulu. The table below shows the 2014 Honolulu Area Median Income (AMI), as well as the income limits for the five categories that were evaluated from 30% of AMI through 140% AMI. The income definitions used in the analysis are those published by the Department of Planning and Permitting, City and County of Honolulu (DPP).

	Household Size (Persons)					
	1	2	3	4	5	6 +
30% AMI	\$20,150	\$23,000	\$25,900	\$28,750	\$31,050	\$33,350
50% AMI	\$33,550	\$38,350	\$43,150	\$47,900	\$51,750	\$55,600
80% AMI	\$53,700	\$61,350	\$69,000	\$76,650	\$82,800	\$88,950
120% AMI	\$80,560	\$92,020	\$103,550	\$114,980	\$124,200	\$133,420
140% AMI	\$93,980	\$107,360	\$120,810	\$134,140	\$144,900	\$155,660
Median (100% of Median)	\$67,100	\$76,700	\$86,300	\$95,800	\$103,500	\$111,200

The analysis is conducted using a model that KMA developed and has applied to similar evaluations in many other jurisdictions. The model inputs are all local data to the extent possible, and are fully documented in the following description.

Analysis Steps

The tables at the end of this section present a summary of the nexus analysis steps for the prototype units. Following is a description of each step of the analysis.

Step 1 – Estimate of Total New Employees

Table C-1 commences with the total number of employees associated with the new market rate units. The employees were estimated based on household expenditures of new residents using the IMPLAN model (see Section B).

Step 2 – Changing Industries Adjustment and Net New Jobs

The local economy, like that of the U.S. as a whole, is constantly evolving. In Honolulu, employment in certain sectors of the economy has been declining including manufacturing, information (includes newspapers), and finance and insurance (includes banks which have become increasingly reliant on ATMs). Jobs lost in these declining sectors were replaced by job growth in other industry sectors.

Step 2 makes an adjustment to take ongoing changes in the economy into account recognizing that jobs added are not 100% net new in all cases. A 17% adjustment is utilized based on the long term shifts in employment that have occurred in some sectors of the local economy and the likelihood of continuing changes in the future. Long term declines in employment experienced in certain sectors of the economy mean that some of the new jobs are being filled by workers that have been displaced from another industry and who are presumed to already have housing locally. Existing workers downsized from declining industries are assumed to be available to fill a portion of the new retail, restaurant, health care, and other jobs associated with services to residents. This is a conservative assumption given some displaced workers may exit the workforce entirely by retiring rather than seek a new job in one of the industries serving new residents.

The 17% downward adjustment used for purposes of the analysis was derived from data available through the State of Hawaii Research and Statistics Office on employment by industry in Honolulu over the eighteen year period from 2013 to 1995. Employment in 1995 was compared to the most recent data available for 2013 because the unemployment rate was the same. Selection of a year with a similar unemployment rate is to separate short-term or cyclical declines from long-term changes warranting an adjustment in the nexus analysis. Over the period from 1995 through 2013, approximately 9,400 jobs were lost in declining industry sectors. Over the same period, growing and stable industries added a total of 56,800 jobs. The figures are used to establish a ratio between jobs lost in declining industries to jobs gained in growing and stable industries at 17%⁸. The 17% factor is applied as an adjustment in the analysis, effectively assuming approximately one in every six new jobs is filled by a worker down-sized from a declining industry and who already has housing.

⁸ The 17% ratio is calculated as 9,400 jobs lost in declining sectors excluding defense divided by 56,800 jobs gained in growing and stable sectors = 16.5% (rounded to 17%).

Step 3 – Adjustment from Employees to Employee Households

This step (Table C-1) converts the number of employees to the number of employee households, recognizing that there is, on average, more than one worker per household, and thus the number of housing units in demand for new workers is reduced. The workers-per-worker-household ratio eliminates from the equation all non-working households, such as retired persons, students, and those on public assistance. The average for Honolulu of 1.92 workers per worker household (from the U. S. Census Bureau 2011-2013 American Community Survey) is used for this step in the analysis. The number of jobs is divided by 1.92 to determine the number of worker households. This ratio is distinguished from the overall number of workers per household in that the denominator includes only households with at least one worker. If the average number of workers in all households were used, it would have produced a greater demand for housing units. The 1.92 ratio covers all workers, full and part time.

Step 4 – Occupational Distribution of Employees

The occupational breakdown of employees is the first step to arrive at income level. The output from the IMPLAN model provides the number of employees by industry sector, shown in Table B-1. The IMPLAN output is paired with data from the Department of Labor, Bureau of Labor Statistics May 2013 Occupational Employment Survey (OES) to estimate the occupational composition of employees for each industry sector.

Step 4a – Translation from IMPLAN Industry Codes to NAICS Industry Codes

The output of the IMPLAN model is jobs by industry sector using IMPLAN's own industry classification system which consists of 440 industry sectors. The OES occupation data uses the North American Industry Classification System (NAICS). Estimates of jobs by IMPLAN sector must be translated into estimates by NAICS code for consistency with the OES data.

The NAICS system is organized into industry codes ranging from two- to six-digits. Two-digit codes are the broadest industry categories and six-digit codes are the most specific. Within a two-digit NAICS code, there may be several three-digit codes and within each three digit code, several four-digit codes, etc. A chart published by IMPLAN relates each IMPLAN industry sector with one or more NAICS codes, with matching NAICS codes ranging from the two-digit level to the five-digit level. For purposes of the nexus analysis, all employment estimates must be aggregated to the four digit NAICS code level to align with OES data which is organized by four-digit NAICS code. For some industry sectors, an allocation is necessary between more than one four-digit NAICS code. Where required, allocations are made proportionate to total employment at the national level from the OES.

The table below illustrates analysis Step 4a in which employment estimates by IMPLAN Code are translated to NAICS codes and then aggregated at the four digit NAICS code level. The

examples used are Child Day Care Centers and Food and Drinking Places. The process is applied to all the industry sectors.

Illustration of Model Step 4a.						
A. IMPLAN Output by IMPLAN Industry Sector		B. Link to Corresponding NAICS Code		C. Aggregate at 4-Digit NAICS Code Level		
<u>Jobs</u>	<u>IMPLAN Sector</u>	<u>Jobs</u>	<u>NAICS Code</u>	<u>Jobs</u>	<u>% Total Employment</u>	<u>4-Digit NAICS</u>
1.0	399 - Child day care services	1.0	6244 Child day care services	1.0	100%	6244 Child day care services
7.9	413 - Food and Drinking Places	7.9	722 Food and Drinking Places	7.1	91%	7225 Restaurants and Other Eating Places
				0.5	6%	7223 Special Food Services
				0.3	3%	7224 Drinking Places (Alcoholic Beverages)

Step 4b – Apply OES Data to Estimate Occupational Distribution

Employment estimates by four-digit NAICS code from step 4a are paired with data on occupational composition within each industry from the OES to generate an estimate of employment by detailed occupational category. As shown on Table C-1, new jobs will be distributed across a variety of occupational categories. The three largest occupational categories are office and administrative support (17%), sales (15%), and food preparation and serving (13%). Step 4 of Table C-1 indicates the percentage and number of employee households by occupation associated with 100 market rate units.

Step 5 – Estimates of Employee Households Meeting the Lower Income Definitions

In this step, occupations are translated to employee incomes based on recent Honolulu wage and salary information obtained from the Bureau of Labor Statistics Occupational Employment Survey for Honolulu. The wage and salary information summarized in Appendix 2 Tables 2 and 4 provided the income inputs to the model.

For each occupational category shown in Table C-1, the OES data provides a distribution of specific occupations within the category. For example, within the Food Preparation and Serving Category, there are Supervisors, Cooks, Bartenders, Waiters and Waitresses, Dishwashers, etc. In total there are over 100 detailed occupation categories included in the analysis as shown in Appendix 2, Tables 2 and 4. The analysis uses a separate OES data set on compensations to reflect the distribution of wages specific to workers in Honolulu as of 2013 for each of the detailed occupation categories.

For each detailed occupational category, the distribution of wages is used to calculate the percent of worker households that would fall into each income category. The calculation is performed for each possible combination of household size and number of workers in the household. For households with more than one worker, individual *employee* income data was used to calculate the household income by assuming multiple earner households are, on average, formed of individuals with similar incomes.

The table below illustrates Step 5 as applied to food preparation and serving workers. Annual compensation for food preparation and serving workers in Honolulu as of 2013 is distributed⁹ around a mean of \$19,700. For households with one worker, 64% of one person households are estimated to qualify as Extremely Low and 100% of households with two or more people are estimated to qualify. For households with two workers, no households of five persons or less are estimated to qualify as Extremely Low and only 17% of six person households are estimated to qualify. No households that have three workers are expected to qualify as Extremely Low.

Step 5 Illustration for Food Preparation and Serving Worker Households						
<i>Percent Qualifying as Extremely Low for Each Possible Household Size / No. of Workers Combination</i>						
Percent of Worker Households That Would Qualify as Extremely Low For Each Possible Combination of Household Size and No. of Workers Applying 2014 Income Limits for Honolulu						
HH Size Limit	1 Person \$20,150	2 Person \$23,000	3 Person \$25,900	4 Person \$28,750	5 Person \$31,050	6 Person \$33,350
<u>No. Workers in Household</u>						
1	64%	100%	100%	100%	100%	100%
2	N/A	0%	0%	0%	0%	17%
3 or more ¹⁰	N/A	N/A	0%	0%	0%	0%

The step illustrated above is repeated for each detailed worker occupation category and each of the five affordability tiers. At the end of Step 5, the nexus model has established a matrix indicating the percentages of households that would qualify in the affordable income tiers for every detailed occupational category and every potential combination of household size and number of workers in the household.

Step 6 – Distribution of Household Size and Number of Workers

In this step, we account for the distribution in household sizes and number of workers for Honolulu households using local data obtained from the U.S. Census. Census data is used to develop a set of percentage factors representing the distribution of household sizes and number of workers within working households in Honolulu. The following table presents the percentage factors used in the analysis.

⁹ In addition to the mean compensation, BLS reported 25th, 50th, and 75th percentile compensations are utilized.

¹⁰ Census data aggregates households with three or more workers; therefore, a corresponding aggregation is necessary for purposes of the analysis.

Step 6: Percentage of Honolulu Households by Size and Number of Workers						
	Household Size (Persons)					
	1	2	3	4	5	6+
<u>No. Workers in Household</u>						
1	16.78%	13.33%	7.69%	4.52%	2.44%	2.97%
2	N/A	14.86%	8.92%	6.06%	3.27%	3.98%
3 or more	N/A	N/A	3.10%	5.50%	2.96%	3.61%

Note: percentages sum to 100%

The percentage factors are specific to Honolulu and are derived from the 2011 – 2013 American Community Survey. Application of these percentage factors accounts for the following:

- Households have a range in size and a range in the number of workers.
- Large households generally have more workers than smaller households.

The result of Step 6 is a distribution of Honolulu working households by number of workers and household size.

Step 7 – Estimate of Number of Households that Meet Size and Income Criteria

Step 7 is the final step to calculate the number of worker households meeting the size and income criteria for the five affordability tiers. The calculation combines the matrix of results from Step 5 on percentage of worker households that would meet the income criteria at each potential household size / no. of workers combination, with Step 6, the percentage of worker households having a given household size / number of workers combination. The result is the percentage of households that fall into each affordability tier. The percentages are then multiplied by the number of households from Step 3 to arrive at number of households in each affordability tier.

Tables C-2.1 through C-2.5 shows the result after completing Steps 5, 6, and 7 for each of the five individual affordability tiers.

Summary Findings

Table C-3 indicates the results of the analysis for each of the residential prototypes. The table presents the number of households generated in each affordability category and the total number over 140% of Area Median Income.

The findings in Table C-3 are presented below. The table shows the total demand for affordable housing units associated with 100 market rate units.

New Worker Households by Income Level per 100 Market Rate Units					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Extr. Low (0% - 30% AMI)	4.0	3.6	3.2	4.3	3.2
Very Low (30% - 50% AMI)	7.7	7.0	6.4	8.3	6.2
Low (50% - 80% AMI)	8.0	7.2	6.6	8.6	6.5
Moderate (80% - 120% AMI)	5.0	4.5	4.2	5.3	4.0
Subtotal through 120% AMI	24.7	22.2	20.4	26.4	20.0
140% Tier (120% -140% AMI)	1.2	1.1	1.0	1.3	1.0
Subtotal through 140% AMI	25.8	23.3	21.4	27.7	20.9
Greater than 140% AMI	3.2	2.9	2.7	3.4	2.6
Total, New Households	29.0	26.2	24.1	31.1	23.5

Housing demand for new worker households earning less than 120% of AMI ranges from approximately 26 units per 100 market rate units for High-Rise Condo units, to 20 units per 100 market rate units for apartments. Including housing needs at the 120% to 140% AMI tier increases these figures by approximately one unit for each 100 market rate units. Housing demand is distributed across the lower income tiers with the greatest number of households in the Low-Income tier from 50% to 80% AMI. The finding that the jobs associated with household spending tend to be low-paying jobs where the workers will require housing affordable at the lower income levels is not surprising. As noted above, household spending results in employment that is concentrated in lower paid occupations including food preparation, administrative, and retail sales.

Inclusionary Percentages Supported

The analysis findings identify how many lower income households are generated for every 100 market rate units. These findings are adjusted to an inclusionary percentage which represents the percentage of units provided on-site within a project that would fully mitigate the affordable housing impacts as documented in this nexus analysis.

The percentages are calculated including both market rate and affordable units (for example, 25 affordable units per 100 market rate units translates to a project of 125 units; 25 affordable units out of 125 units equals 20%).

The table below presents the results of the analysis, drawn from Table C-4. Each tier is cumulative, or inclusive of the tiers above. The purpose of showing the figures on a cumulative basis is so they can be readily compared to potential inclusionary requirements that may be considered. As an example, for new single family projects, the analysis indicates that an inclusionary requirement of 19.8% with affordable units available to households earning up to 120% of AMI would be sufficient to mitigate the affordable housing need through 120% of AMI.

The percentages represent the inclusionary requirement that would be sufficient to fully offset the increased affordable housing need from the services and service workers that support the new residential development.

Cumulative Inclusionary Percentage to Mitigate Increased Affordable Housing Need					
	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Extr. Low (up to 30% AMI)	3.8%	3.5%	3.1%	4.1%	3.1%
Very Low (up to 50% AMI)	10.5%	9.5%	8.8%	11.1%	8.7%
Low (up to 80% AMI)	16.5%	15.1%	14.0%	17.4%	13.8%
Moderate (up to 120% AMI)	19.8%	18.2%	16.9%	20.9%	16.7%
140% Tier (up to 140% AMI)	20.5%	18.9%	17.6%	21.7%	17.3%

TABLE C-1
NET NEW HOUSEHOLDS AND OCCUPATION DISTRIBUTION
EMPLOYEE HOUSEHOLDS GENERATED
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI

	Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Step 1 - Employees ¹	67.1	60.5	55.7	71.8	54.3
Step 2 - Adjustment for Changing Industries (17%)	55.7	50.2	46.2	59.6	45.1
Step 3 - Adjustment for Number of Households (1.92) ²	29.0	26.2	24.1	31.1	23.5
Step 4 - Occupation Distribution ³					
Management Occupations	4.3%	4.3%	4.4%	4.3%	4.3%
Business and Financial Operations	4.7%	4.7%	4.6%	4.7%	4.7%
Computer and Mathematical	1.4%	1.4%	1.4%	1.4%	1.4%
Architecture and Engineering	0.3%	0.3%	0.4%	0.3%	0.3%
Life, Physical, and Social Science	0.4%	0.4%	0.4%	0.4%	0.4%
Community and Social Services	1.8%	1.8%	1.8%	1.8%	1.8%
Legal	0.9%	0.9%	0.8%	0.9%	0.9%
Education, Training, and Library	3.4%	3.4%	2.9%	3.4%	3.4%
Arts, Design, Entertainment, Sports, and Media	1.5%	1.5%	1.5%	1.5%	1.5%
Healthcare Practitioners and Technical	7.7%	7.7%	8.0%	7.7%	7.7%
Healthcare Support	4.1%	4.1%	4.3%	4.1%	4.1%
Protective Service	1.5%	1.5%	1.5%	1.5%	1.5%
Food Preparation and Serving Related	13.2%	13.2%	13.3%	13.2%	13.2%
Building and Grounds Cleaning and Maint.	5.9%	5.9%	5.9%	5.9%	5.9%
Personal Care and Service	5.5%	5.5%	5.3%	5.5%	5.5%
Sales and Related	14.7%	14.7%	14.3%	14.7%	14.7%
Office and Administrative Support	16.8%	16.8%	16.9%	16.8%	16.8%
Farming, Fishing, and Forestry	0.1%	0.1%	0.1%	0.1%	0.1%
Construction and Extraction	0.8%	0.8%	0.8%	0.8%	0.8%
Installation, Maintenance, and Repair	3.6%	3.6%	3.8%	3.6%	3.6%
Production	1.9%	1.9%	1.9%	1.9%	1.9%
Transportation and Material Moving	<u>5.6%</u>	<u>5.6%</u>	<u>5.6%</u>	<u>5.6%</u>	<u>5.6%</u>
Totals	100.0%	100.0%	100.0%	100.0%	100.0%
Management Occupations	1.3	1.1	1.1	1.3	1.0
Business and Financial Operations	1.4	1.2	1.1	1.4	1.1
Computer and Mathematical	0.4	0.4	0.3	0.4	0.3
Architecture and Engineering	0.1	0.1	0.1	0.1	0.1
Life, Physical, and Social Science	0.1	0.1	0.1	0.1	0.1
Community and Social Services	0.5	0.5	0.4	0.6	0.4
Legal	0.3	0.2	0.2	0.3	0.2
Education, Training, and Library	1.0	0.9	0.7	1.1	0.8
Arts, Design, Entertainment, Sports, and Media	0.4	0.4	0.4	0.5	0.4
Healthcare Practitioners and Technical	2.2	2.0	1.9	2.4	1.8
Healthcare Support	1.2	1.1	1.0	1.3	1.0
Protective Service	0.4	0.4	0.4	0.5	0.4
Food Preparation and Serving Related	3.8	3.4	3.2	4.1	3.1
Building and Grounds Cleaning and Maint.	1.7	1.5	1.4	1.8	1.4
Personal Care and Service	1.6	1.4	1.3	1.7	1.3
Sales and Related	4.3	3.8	3.4	4.6	3.4
Office and Administrative Support	4.9	4.4	4.1	5.2	4.0
Farming, Fishing, and Forestry	0.0	0.0	0.0	0.0	0.0
Construction and Extraction	0.2	0.2	0.2	0.2	0.2
Installation, Maintenance, and Repair	1.0	0.9	0.9	1.1	0.9
Production	0.5	0.5	0.5	0.6	0.4
Transportation and Material Moving	<u>1.6</u>	<u>1.5</u>	<u>1.3</u>	<u>1.7</u>	<u>1.3</u>
Totals	29.0	26.2	24.1	31.1	23.5

Notes:

¹ Estimated employment generated by expenditures of households within 100 prototypical market rate units. Employment estimates based on economic model, IMPLAN.

² Adjustment from number of workers to households using average of 1.92 workers per worker household derived from the U.S. Census American Community Survey 2011 to 2013.

³ See Appendix 2, Tables 1 through 4 for additional information on Major Occupation Categories.

**TABLE C-2.1
EXTREMELY LOW-INCOME EMPLOYEE HOUSEHOLDS¹ GENERATED
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

Per 100 Market Rate Units

	Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Step 5 & 6 - Extremely Low Income Households (under 30% AMI) within Major Occupation Categories²					
Management	0.00	0.00	0.00	0.00	0.00
Business and Financial Operations	0.00	0.00	0.00	0.00	0.00
Computer and Mathematical	-	-	-	-	-
Architecture and Engineering	-	-	-	-	-
Life, Physical and Social Science	-	-	-	-	-
Community and Social Services	-	-	-	-	-
Legal	-	-	-	-	-
Education Training and Library	0.06	0.05	0.04	0.06	0.05
Arts, Design, Entertainment, Sports, & Media	-	-	-	-	-
Healthcare Practitioners and Technical	0.00	0.00	0.00	0.00	0.00
Healthcare Support	0.14	0.13	0.12	0.15	0.12
Protective Service	-	-	-	-	-
Food Preparation and Serving Related	1.12	1.01	0.94	1.20	0.91
Building Grounds and Maintenance	0.29	0.26	0.25	0.31	0.23
Personal Care and Service	0.36	0.32	0.29	0.38	0.29
Sales and Related	0.85	0.77	0.67	0.91	0.69
Office and Admin	0.37	0.33	0.29	0.39	0.30
Farm, Fishing, and Forestry	-	-	-	-	-
Construction and Extraction	-	-	-	-	-
Installation Maintenance and Repair	0.01	0.01	0.01	0.01	0.01
Production	-	-	-	-	-
Transportation and Material Moving	0.22	0.20	0.18	0.24	0.18
ELI Households - Major Occupations	3.4	3.1	2.8	3.7	2.8
ELI Households¹ - all other occupations	0.6	0.5	0.5	0.6	0.5
Total ELI Households¹	4.0	3.6	3.2	4.3	3.2

¹ Includes households earning from zero through 30% of Honolulu Area Median Income.

² See Appendix 2 Tables 1 through 4 for additional information on Major Occupation Categories. Note that the model places individual employees into households. Many households have multiple income sources and therefore household income is higher than the wages shown in Appendix 2 tables 2 and 4. The distribution of the number of workers per worker household and the distribution of household size are based on American Community Survey data.

TABLE C-2.2
VERY LOW-INCOME EMPLOYEE HOUSEHOLDS¹ GENERATED
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI

Per 100 Market Rate Units

	Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Step 5 & 6 - Very Low Income Households (30% -50% AMI) within Major Occupation Categories ²					
Management	0.03	0.03	0.03	0.04	0.03
Business and Financial Operations	0.06	0.06	0.05	0.07	0.05
Computer and Mathematical	-	-	-	-	-
Architecture and Engineering	-	-	-	-	-
Life, Physical and Social Science	-	-	-	-	-
Community and Social Services	-	-	-	-	-
Legal	-	-	-	-	-
Education Training and Library	0.23	0.20	0.16	0.24	0.18
Arts, Design, Entertainment, Sports, & Media	-	-	-	-	-
Healthcare Practitioners and Technical	0.05	0.05	0.04	0.06	0.04
Healthcare Support	0.40	0.37	0.35	0.43	0.33
Protective Service	-	-	-	-	-
Food Preparation and Serving Related	1.34	1.21	1.12	1.43	1.08
Building Grounds and Maintenance	0.57	0.52	0.49	0.61	0.46
Personal Care and Service	0.54	0.49	0.43	0.58	0.44
Sales and Related	1.37	1.23	1.10	1.46	1.11
Office and Admin	1.37	1.23	1.12	1.47	1.11
Farm, Fishing, and Forestry	-	-	-	-	-
Construction and Extraction	-	-	-	-	-
Installation Maintenance and Repair	0.15	0.13	0.13	0.16	0.12
Production	-	-	-	-	-
Transportation and Material Moving	0.52	0.47	0.43	0.55	0.42
Very Low Households - Major Occupations	6.6	6.0	5.5	7.1	5.4
Very Low Households ¹ - all other occupations	1.1	1.0	0.9	1.2	0.9
Total Very Low Households¹	7.7	7.0	6.4	8.3	6.2

¹ Includes households earning from 30% through 50% of Honolulu Area Median Income.

² See Appendix 2 Tables 1 through 4 for additional information on Major Occupation Categories. Note that the model places individual employees into households. Many households have multiple income sources and therefore household income is higher than the wages shown in Appendix 2 tables 2 and 4. The distribution of the number of workers per worker household and the distribution of household size are based on American Community Survey data.

TABLE C-2.3
LOW-INCOME EMPLOYEE HOUSEHOLDS¹ GENERATED
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI

Per 100 Market Rate Units

	Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Step 5 & 6 - Low Income Households (50% - 80% AMI) within Major Occupation Categories ²					
Management	0.17	0.15	0.14	0.18	0.14
Business and Financial Operations	0.29	0.26	0.24	0.31	0.23
Computer and Mathematical	-	-	-	-	-
Architecture and Engineering	-	-	-	-	-
Life, Physical and Social Science	-	-	-	-	-
Community and Social Services	-	-	-	-	-
Legal	-	-	-	-	-
Education Training and Library	0.31	0.28	0.22	0.33	0.25
Arts, Design, Entertainment, Sports, & Media	-	-	-	-	-
Healthcare Practitioners and Technical	0.20	0.18	0.17	0.21	0.16
Healthcare Support	0.38	0.34	0.33	0.41	0.31
Protective Service	-	-	-	-	-
Food Preparation and Serving Related	0.93	0.84	0.78	1.00	0.75
Building Grounds and Maintenance	0.48	0.43	0.40	0.52	0.39
Personal Care and Service	0.46	0.41	0.37	0.49	0.37
Sales and Related	1.22	1.10	0.99	1.30	0.99
Office and Admin	1.62	1.46	1.35	1.73	1.31
Farm, Fishing, and Forestry	-	-	-	-	-
Construction and Extraction	-	-	-	-	-
Installation Maintenance and Repair	0.31	0.28	0.27	0.33	0.25
Production	-	-	-	-	-
Transportation and Material Moving	0.52	0.47	0.44	0.56	0.42
Low Inc. Households - Major Occupations	6.9	6.2	5.7	7.4	5.6
Low Inc. Households ¹ - all other occupations	1.1	1.0	0.9	1.2	0.9
Total Low Income Households¹	8.0	7.2	6.6	8.6	6.5

¹ Includes households earning from 50% through 80% of Honolulu Area Median Income.

² See Appendix 2 Tables 1 through 4 for additional information on Major Occupation Categories. Note that the model places individual employees into households. Many households have multiple income sources and therefore household income is higher than the wages shown in Appendix 2 tables 2 and 4. The distribution of the number of workers per worker household and the distribution of household size are based on American Community Survey data.

**TABLE C-2.4
MODERATE-INCOME EMPLOYEE HOUSEHOLDS¹ GENERATED
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

Per 100 Market Rate Units

	Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Step 5 & 6 - Moderate Income Households (80% - 120% AMI) within Major Occupation Categories ²					
Management	0.26	0.24	0.22	0.28	0.21
Business and Financial Operations	0.40	0.36	0.33	0.43	0.32
Computer and Mathematical	-	-	-	-	-
Architecture and Engineering	-	-	-	-	-
Life, Physical and Social Science	-	-	-	-	-
Community and Social Services	-	-	-	-	-
Legal	-	-	-	-	-
Education Training and Library	0.23	0.20	0.16	0.24	0.18
Arts, Design, Entertainment, Sports, & Media	-	-	-	-	-
Healthcare Practitioners and Technical	0.52	0.47	0.45	0.55	0.42
Healthcare Support	0.19	0.17	0.17	0.20	0.15
Protective Service	-	-	-	-	-
Food Preparation and Serving Related	0.26	0.24	0.22	0.28	0.21
Building Grounds and Maintenance	0.26	0.23	0.21	0.28	0.21
Personal Care and Service	0.15	0.13	0.12	0.16	0.12
Sales and Related	0.45	0.40	0.37	0.48	0.36
Office and Admin	1.02	0.92	0.88	1.10	0.83
Farm, Fishing, and Forestry	-	-	-	-	-
Construction and Extraction	-	-	-	-	-
Installation Maintenance and Repair	0.28	0.26	0.25	0.30	0.23
Production	-	-	-	-	-
Transportation and Material Moving	0.25	0.23	0.21	0.27	0.20
Moderate Inc. Households - Major Occupations	4.3	3.9	3.6	4.6	3.5
Moderate Inc. Households ¹ - all other occupations	0.7	0.6	0.6	0.7	0.6
Total Moderate Income Households¹	5.0	4.5	4.2	5.3	4.0

¹ Includes households earning from 80% through 120% of Honolulu Area Median Income.

² See Appendix 2 Tables 1 through 4 for additional information on Major Occupation Categories. Note that the model places individual employees into households. Many households have multiple income sources and therefore household income is higher than the wages shown in Appendix 2 tables 2 and 4. The distribution of the number of workers per worker household and the distribution of household size are based on American Community Survey data.

**TABLE C-2.5
EMPLOYEE HOUSEHOLDS FROM 120% TO 140% AMI¹ GENERATED
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

Per 100 Market Rate Units

	Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Step 5 & 6 - Households from 120% to 140% AMI within Major Occupation Categories ²					
Management	0.13	0.12	0.11	0.14	0.10
Business and Financial Operations	0.14	0.12	0.11	0.15	0.11
Computer and Mathematical	-	-	-	-	-
Architecture and Engineering	-	-	-	-	-
Life, Physical and Social Science	-	-	-	-	-
Community and Social Services	-	-	-	-	-
Legal	-	-	-	-	-
Education Training and Library	0.06	0.05	0.04	0.06	0.05
Arts, Design, Entertainment, Sports, & Media	-	-	-	-	-
Healthcare Practitioners and Technical	0.23	0.21	0.20	0.25	0.19
Healthcare Support	0.01	0.01	0.01	0.02	0.01
Protective Service	-	-	-	-	-
Food Preparation and Serving Related	0.02	0.02	0.02	0.03	0.02
Building Grounds and Maintenance	0.02	0.02	0.01	0.02	0.02
Personal Care and Service	0.01	0.01	0.01	0.01	0.01
Sales and Related	0.07	0.07	0.06	0.08	0.06
Office and Admin	0.18	0.17	0.17	0.20	0.15
Farm, Fishing, and Forestry	-	-	-	-	-
Construction and Extraction	-	-	-	-	-
Installation Maintenance and Repair	0.09	0.08	0.08	0.10	0.07
Production	-	-	-	-	-
Transportation and Material Moving	0.04	0.03	0.03	0.04	0.03
Households: 120%-140% AMI - Major Occupations	1.0	0.9	0.9	1.1	0.8
Households 120%-140% AMI ¹ - other occupations	0.2	0.1	0.1	0.2	0.1
Total Households from 120%-140% AMI ¹	1.2	1.1	1.0	1.3	1.0

¹ Includes households earning from 120% through 140% of Honolulu Area Median Income (AMI).

² See Appendix 2 Tables 1 through 4 for additional information on Major Occupation Categories. Note that the model places individual employees into households. Many households have multiple income sources and therefore household income is higher than the wages shown in Appendix 2 tables 2 and 4. The distribution of the number of workers per worker household and the distribution of household size are based on American Community Survey data.

**TABLE C-3
IMPACT ANALYSIS SUMMARY
EMPLOYEE HOUSEHOLDS GENERATED
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

**RESIDENTIAL UNIT DEMAND IMPACTS
PER 100 MARKET RATE UNITS**

	Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Number of New Households¹					
Under 30% Area Median Income	4.0	3.6	3.2	4.3	3.2
30% to 50% Area Median Income	7.7	7.0	6.4	8.3	6.2
50% to 80% Area Median Income	8.0	7.2	6.6	8.6	6.5
80% to 120% Area Median Income	5.0	4.5	4.2	5.3	4.0
Subtotal through 120% of Median	24.7	22.2	20.4	26.4	20.0
120% to 140% Area Median Income	1.2	1.1	1.0	1.3	1.0
Subtotal through 140% of Median	25.8	23.3	21.4	27.7	20.9
Over 140% Area Median Income	3.2	2.9	2.7	3.4	2.6
Total Employee Households	29.0	26.2	24.1	31.1	23.5

Percent of New Households¹

Under 30% Area Median Income	14%	14%	13%	14%	14%
30% to 50% Area Median Income	27%	27%	26%	27%	27%
50% to 80% Area Median Income	28%	28%	28%	28%	28%
80% to 120% Area Median Income	17%	17%	17%	17%	17%
Subtotal through 120% of Median	85%	85%	85%	85%	85%
120% to 140% Area Median Income	4%	4%	4%	4%	4%
Subtotal through 140% of Median	89%	89%	89%	89%	89%
Over 140% Area Median Income	11%	11%	11%	11%	11%
Total Employee Households	100%	100%	100%	100%	100%

Notes

¹ Households of retail, education, healthcare and other workers that serve residents of new market rate units.

**TABLE C-4
INCLUSIONARY REQUIREMENT SUFFICIENT TO MITIGATE INCREASED AFFORDABLE HOUSING NEEDS
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

	Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Supported Inclusionary Requirement					
Affordable Housing Need Per 100 Market Rate Units - Cumulative Through					
30% OF MEDIAN INCOME	4.0 Units	3.6 Units	3.2 Units	4.3 Units	3.2 Units
50% OF MEDIAN INCOME	11.7 Units	10.5 Units	9.6 Units	12.5 Units	9.5 Units
80% OF MEDIAN INCOME	19.7 Units	17.8 Units	16.2 Units	21.1 Units	16.0 Units
120% OF MEDIAN INCOME	24.7 Units	22.2 Units	20.4 Units	26.4 Units	20.0 Units
140% OF MEDIAN INCOME	25.8 Units	23.3 Units	21.4 Units	27.7 Units	20.9 Units
Inclusionary Percentage Sufficient to Mitigate Impacts - Cumulative Through ¹					
30% OF MEDIAN INCOME	3.8%	3.5%	3.1%	4.1%	3.1%
50% OF MEDIAN INCOME	10.5%	9.5%	8.8%	11.1%	8.7%
80% OF MEDIAN INCOME	16.5%	15.1%	14.0%	17.4%	13.8%
120% OF MEDIAN INCOME	19.8%	18.2%	16.9%	20.9%	16.7%
140% OF MEDIAN INCOME	20.5%	18.9%	17.6%	21.7%	17.3%

Notes:

¹ Calculated by dividing the number of affordable units needed by the total number of units (affordable units needed + 100 market rate units).

D. MITIGATION COSTS

This section takes the conclusions of the previous section on the number of households in the lower income categories associated with the market rate units and identifies the total cost of assistance required to make housing affordable. This section puts a cost on the units for each income level to produce the “total nexus cost.” This is done for each of the prototype units. The estimate of total nexus cost is needed in order to quantify the amount of the in-lieu fee that would be sufficient to fully mitigate the increased affordable housing impacts of the new market rate units.

A key component of the nexus cost analysis is the size of the gap between what households can afford and the cost of producing new housing in Honolulu, known as the ‘affordability gap.’ Affordability gaps are calculated for each of the five categories of area median income: Extremely Low (under 30% of median), Very Low (30% to 50%), Low (50% to 80%), Moderate (80% to 120%), and the 140% AMI Tier (120% to 140%). The following summarizes the analysis of mitigation cost which is based on the affordability gap or net cost to deliver units that are affordable to worker households in the lower income tiers. Detailed affordability gap calculations are presented in Tables D-1 through D-4 at the end of this section.

Affordable Unit Prototypes Subsidized with In-lieu Fees

For estimating the affordability gap, there is a need to match a household of each income level with a unit type and size according to governmental regulations and City practices and policies. The analysis assumes that the City will help subsidize affordable ownership units for households in the Moderate and 140% AMI Tier. The prototype affordable unit should reflect a modest unit consistent with what the City is likely to assist and appropriate for housing the average worker household in these income tiers, which in the case of Honolulu is assumed to be a four person household in a three-bedroom townhome unit. The analysis assumes households earning less than 80% of Area Median Income will be housed in rental units. The analysis uses a two bedroom affordable rental prototype.

For the purposes of estimating the affordability gaps, we do not assume additional sources of affordable housing financing such as the federal income tax credit program. While some recent affordable housing developments in Honolulu have utilized these additional funding sources, it is not assured that these sources will be available in the future. Accessing these sources is also highly competitive due to the limited supply. Of importance, Honolulu has a sizable existing deficiency of affordable housing units and the limited amount of outside subsidy sources has not been sufficient to fully address the existing needs of the community let alone the future needs created by new market rate residential units. The value of tax credits to the project can fluctuate widely. Determining the affordability gap assuming no outside sources is a sound and legitimate approach.

Development Costs

KMA prepared an estimate of total development cost for a typical two bedroom affordable rental unit (inclusive of land, all fees and permits, financing and other indirect costs) based on a review of development costs for affordable multi-family projects in Hawaii. On this basis, KMA concluded that on average, the new affordable rental units would have a total development cost per unit of \$350,000.

For ownership units, total development costs for a typical three bedroom, 1,200 square foot townhome were estimated by KMA to be \$491,000 per unit (\$409 per square foot).

Development Costs			
<i>Income Group</i>	<i>Tenure / Type</i>	<i>Type</i>	<i>Development Cost</i>
0% through 80% AMI	Rental	2BR Apartment	\$350,000
80% through 140% AMI	Ownership	3BR Townhome	\$491,000

Unit Values

For affordable ownership units, unit values are the affordable purchase prices. Affordable purchase prices for ownership units are calculated based on the purchase price affordable to a household earning 120% of AMI for Moderate-Income households and 140% of AMI for the 140% AMI Tier. For a three bedroom unit, KMA calculated the affordable sales price as \$421,000 for a Moderate-Income Unit and \$513,000 for the 140% AMI Tier. Details of the calculation are presented in Tables D-3 and D-4.

For the Extremely Low, Very Low, and Low-Income units, the unit values were estimated based on the amount of permanent debt that can be supported by the project's net operating income (NOI) plus a small amount for deferred developer fees, which is a common source of funding for affordable apartment projects.

Maximum Affordable Sales Prices and Rent Levels				
<i>Income Group</i>	<i>Unit Tenure</i>	<i>Household Size</i>	<i>Maximum Monthly Housing Costs¹¹</i>	<i>Unit Values / Sales Price</i>
Under 30% AMI	Rental	3 persons	\$719 / Month	(\$17,300)
30% to 50% AMI	Rental	3 persons	\$1,199 / Month	\$61,700
50% to 80% AMI	Rental	3 persons	\$1,918 / Month	\$180,700
80% to 120% AMI	Ownership	4 persons	\$3,193 / Month	\$421,150
120% to 140% AMI	Ownership	4 persons	\$3,726 / Month	\$512,650

¹¹ For rental units, maximum housing costs are the affordable rents before utility allowance. For ownership unit, maximum monthly housing costs includes all housing expenses such as mortgage, insurance, property taxes, HOA dues, and utilities.

Affordability Gap

The affordability gap is the difference between the cost of developing a residential unit and the unit values at the affordable rents or sales prices.

The resulting affordability gaps are as follows:

Affordability Gap Calculation			
	<i>Unit Value / Sales Price</i>	<i>Development Cost</i>	<i>Affordability Gap</i>
<u><i>Affordable Rental Units</i></u>			
Extremely Low (Under 30% AMI)	(\$17,300) ¹	\$350,000	\$367,300
Very Low (30% to 50% AMI)	\$61,700	\$350,000	\$288,300
Low (50% to 80% AMI)	\$180,700	\$350,000	\$169,300
<u><i>Affordable Ownership Units</i></u>			
Moderate (80% to 120% AMI)	\$421,150	\$491,000	\$69,850
140% AMI Tier (120% to 140% AMI)	\$512,650	\$491,000	none

¹Negative unit value represents capitalized operating subsidy required.

For the 140% AMI Tier, the affordable sales price exceeds the development cost for the unit, so there is no affordability gap for that income tier when affordable units are provided in a townhome product.

Tables D-1 to D-4 present the detailed affordability gap calculations.

Caveat on Affordability Gaps

The development costs that have been estimated for purposes of the affordability gaps are based on “average” costs for affordable units, not on specific projects or in specific locations. Because they are based on average costs, the affordability gaps quantified herein likely underestimate the costs to construct units in more expensive areas of Honolulu and overestimate the costs to construct in less expensive areas. The primary cost variable from one part of the island to another is land acquisition costs.

Total Nexus Costs

The last step in the linkage fee analysis marries the findings on the numbers of households in each of the lower income ranges associated with the five prototypes to the affordability gaps, or the costs of delivering housing to them in Honolulu.

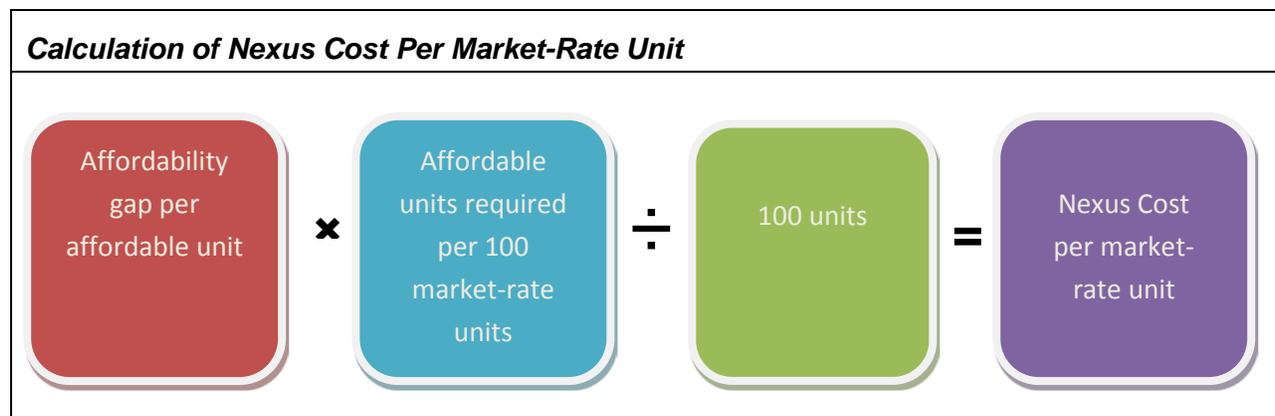
Table D-5 summarizes the analysis. The Affordability Gaps are drawn from the prior discussion. The “Total Nexus Cost per Market Rate Unit” shows the results of the following calculation: the affordability gap times the number of affordable units demanded per market rate unit. (Demand

for affordable units for each of the income ranges is drawn from Table C-3 in the previous section and is adjusted to a per-unit basis from the 100 unit building module.)

The total nexus costs per market rate unit are as follows:

Nexus Cost Per Market Rate Unit						
<i>Income Category</i>	<i>Affordability Gap</i>	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
Ext. Low (30% - 50% AMI)	\$367,300	\$14,600	\$13,200	\$11,900	\$15,700	\$11,800
Very Low (30% - 50% AMI)	\$288,300	\$22,200	\$20,100	\$18,300	\$23,800	\$18,000
Low (50%-80% AMI)	\$169,300	\$13,500	\$12,200	\$11,200	\$14,500	\$11,000
Moderate (80%-120% AMI)	\$69,850	\$3,500	\$3,100	\$2,900	\$3,700	\$2,800
140% Tier (120%-140% AMI)	none	\$0	\$0	\$0	\$0	\$0
Total Nexus Costs		\$53,800	\$48,600	\$44,300	\$57,700	\$43,600

The chart below illustrates how the above nexus costs per unit are calculated:



The Total Nexus Costs, or Mitigation Costs, indicated above, may also be expressed on a per square foot level. The square foot area of the prototype unit used throughout the analysis becomes the basis for the calculation. Again, see Appendix 1 for more discussion of the prototypes. The results per square foot of building area are as follows:

Total Nexus Cost Per Sq.Ft. of Building Area						
<i>Income Category</i>	<i>Affordability Gap</i>	<i>Single Family</i>	<i>Low-Rise Townhomes</i>	<i>Mid-Rise Condo</i>	<i>High-Rise Condo (PUC)</i>	<i>Rental Apartment</i>
<i>Prototype Size</i>		<i>1,700 SF</i>	<i>1,200 SF</i>	<i>1,000 SF</i>	<i>1,000 SF</i>	<i>900 SF</i>
Ext. Low (30% - 50% AMI)	\$367,300	\$8.60	\$11.00	\$11.90	\$15.70	\$13.10
Very Low (30% - 50% AMI)	\$288,300	\$13.10	\$16.80	\$18.30	\$23.80	\$20.00
Low (50%-80% AMI)	\$169,300	\$7.90	\$10.20	\$11.20	\$14.50	\$12.20
Moderate (80%-120% AMI)	\$69,850	\$2.10	\$2.60	\$2.90	\$3.70	\$3.10
140% Tier (120%-140%)	none	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total Nexus Costs		\$31.70	\$40.60	\$44.30	\$57.70	\$48.40

These costs express the total linkage or nexus costs for the five prototype developments in Honolulu. These total nexus costs represent the cost of creating new affordable units to offset the increased affordable housing needs associated with new market-rate residential development. **The totals are not recommended levels for fees; many other policy considerations may be brought to bear in selecting appropriate fee levels.**

**TABLE D-1
AFFORDABILITY GAP FOR FOR-SALE UNITS
RESIDENTIAL NEXUS ANALYSIS
CITY AND COUNTY OF HONOLULU**

	120% AMI	140% AMI
I. Affordable Sale Price		
Building Type	3-BR Townhome	3-BR Townhome
Household Size	4-Person HH	4-Person HH
Unit Size	1,200 SF	1,200 SF
Affordable Sale Price	\$421,150 ⁽¹⁾	\$512,650 ⁽¹⁾
II. Development Costs - Per Unit		
Land Acquisition	\$140,000 ⁽²⁾	\$140,000 ⁽²⁾
Direct Construction	\$260,000 ⁽³⁾	\$260,000 ⁽³⁾
Indirects & Financing	\$91,000 ⁽⁴⁾	\$91,000 ⁽⁴⁾
Total Costs	\$491,000 ⁽⁵⁾	\$491,000 ⁽⁵⁾
III. Affordability Gap - Per Unit		
Affordable Sale Price	\$421,150	\$512,650
(Less) Development Costs	(\$491,000)	(\$491,000)
Affordability Gap	(\$69,850)	\$21,650

⁽¹⁾ See Table 4 for affordable home price estimates.

⁽²⁾ Land acquisition cost based on review of residential land values for lower density prototypes from the City and County of Honolulu property information database.

⁽³⁾ Direct construction cost based on RS Means estimate for 2-story, 1,200 sq. ft. townhome unit with 2-car garage. Cost includes major appliances.

⁽⁴⁾ Indirect & Financing costs based on 35% of direct cost based on data on Hawaii affordable multi-family rental projects (35% to 40%). This figure is considered conservative because multi-family projects typically do not have additional costs of unit sales or carrying costs related to the sales absorption period.

⁽⁵⁾ As a cross-check on total development costs, the total development profit at the average island-wide sale price of \$575,000 would be \$84,000 (\$575,000 minus \$491,000), or approximately 15% of the market rate sale price. This is an indication that the development cost estimate is not excessive.

TABLE D-2
AFFORDABILITY GAPS FOR 30% TO 80% AMI HOUSEHOLDS
RESIDENTIAL NEXUS ANALYSIS
CITY AND COUNTY OF HONOLULU

	30% AMI	50% AMI	80% AMI
I. Affordable Rent - Per Unit			
Average Number of Bedrooms	2 Bedrooms	2 Bedrooms	2 Bedrooms
Average Household Size	3 Person	3 Person	3 Person
Annual Household Income	\$25,890	\$43,150	\$69,040
Monthly Household Income	\$2,158	\$3,596	\$5,753
Income Allocation to Housing	33%	33%	33%
Monthly Housing Cost	\$719	\$1,199	\$1,918
(Less) Utility Allowance ⁽¹⁾	<u>(\$387)</u>	<u>(\$387)</u>	<u>(\$387)</u>
Maximum Monthly Rent	\$332	\$812	\$1,531
II. Net Operating Income - Per Unit			
Annual Rental Income	\$3,986	\$9,739	\$18,369
Other Income	\$250	\$250	\$250
(Less) Vacancy 5.0%	<u>(\$212)</u>	<u>(\$499)</u>	<u>(\$931)</u>
Effective Gross Income (EGI)	\$4,024	\$9,490	\$17,688
(Less) Operating Expenses	<u>(\$5,500)</u>	<u>(\$5,500)</u>	<u>(\$5,500)</u>
Net Operating Income (NOI)	(\$1,476)	\$3,990	\$12,188
III. Affordability Gap - Per Unit			
<u>Sources of Funds</u>			
Supported Mortgage	(\$21,000) ⁽²⁾	\$58,000	\$177,000
Deferred Developer Fee	<u>\$3,700</u>	<u>\$3,700</u>	<u>\$3,700</u>
Total Sources	(\$17,300)	\$61,700	\$180,700
(Less) Total Development Costs ⁽³⁾	<u>(\$350,000)</u>	<u>(\$350,000)</u>	<u>(\$350,000)</u>
Affordability Gap	<u>(\$367,300)</u>	<u>(\$288,300)</u>	<u>(\$169,300)</u>

⁽¹⁾ Utility allowances from DPP Home Price and Rental Rates Guideline (effective January 2014)

⁽²⁾ Negative mortgage amount for 30% AMI units represents capitalized operating subsidy required.

⁽³⁾ Development costs based on the average cost per square foot of Hawaii tax credit projects from 2010 to 2014, excluding land acquisition costs, multiplied by an average 900 square foot 2-bedroom apartment unit, plus a land cost estimated at \$30,000/unit.

**TABLE D-3
ESTIMATED AFFORDABLE HOME PRICES - 120% AMI
RESIDENTIAL NEXUS ANALYSIS
CITY AND COUNTY OF HONOLULU**

Unit Size Household Size	1-Bedroom Unit 2-person HH	2-Bedroom Unit 3-person HH	3-Bedroom Unit 4-person HH	4-Bedroom Unit 5-person HH
Median Income - Honolulu County 2014	\$76,700	\$86,300	\$95,800	\$103,500
Annual Income @ 120%	\$92,040	\$103,560	\$114,960	\$124,200
% Available for Housing Costs	33%	33%	33%	33%
Income Available for Housing Costs	\$30,680	\$34,520	\$38,320	\$41,400
(Less) Property Taxes	(\$1,023)	(\$1,143)	(\$1,263)	(\$1,353)
(Less) HOA	(\$3,600)	(\$3,900)	(\$4,200)	(\$4,500)
(Less) Utilities	(\$2,664)	(\$3,324)	(\$3,936)	(\$4,512)
(Less) Insurance	(\$600)	(\$700)	(\$800)	(\$900)
(Less) Mortgage Insurance	(\$4,212)	(\$4,706)	(\$5,200)	(\$5,577)
Income Available for Mortgage	\$18,581	\$20,747	\$22,921	\$24,558
Mortgage Amount	\$324,300	\$362,100	\$400,100	\$428,700
Down Payment (homebuyer cash)	\$17,050	\$19,050	\$21,050	\$22,550
Affordable Home Price*	\$341,350	\$381,150	\$421,150	\$451,250
Key Assumptions				
- Mortgage Interest Rate	4.00%	4.00%	4.00%	4.00%
- Down Payment	5.0%	5.0%	5.0%	5.0%
- Property Taxes (% of sales price)	0.30%	0.30%	0.30%	0.30%
- HOA (per month)	\$300	\$325	\$350	\$375
- Utilities (per month)	\$222	\$277	\$328	\$376
- Mortgage Insurance (% of loan amount)	1.30%	1.30%	1.30%	1.30%
* Current DPP Calculated Price	\$571,493	\$673,101	\$714,087	\$771,348

Source: All assumptions by KMA. Note: current DPP pricing schedules do not account for taxes, insurance, utilities, or HOA. Thus DPP's price schedules indicate significantly higher affordable prices than shown in this table. DPP staff do not currently keep data on actual sale prices of affordable units.

**TABLE D-4
ESTIMATED AFFORDABLE HOME PRICES - 140% AMI
RESIDENTIAL NEXUS ANALYSIS
CITY AND COUNTY OF HONOLULU**

Unit Size Household Size	1-Bedroom Unit 2-person HH	2-Bedroom Unit 3-person HH	3-Bedroom Unit 4-person HH	4-Bedroom Unit 5-person HH
Median Income - Honolulu County 2014	\$76,700	\$86,300	\$95,800	\$103,500
Annual Income @ 140%	\$107,380	\$120,820	\$134,120	\$144,900
% Available for Housing Costs	33%	33%	33%	33%
Income Available for Housing Costs	\$35,793	\$40,273	\$44,707	\$48,300
(Less) Property Taxes	(\$1,242)	(\$1,392)	(\$1,539)	(\$1,650)
(Less) HOA	(\$3,600)	(\$3,900)	(\$4,200)	(\$4,500)
(Less) Utilities	(\$2,664)	(\$3,324)	(\$3,936)	(\$4,512)
(Less) Insurance	(\$600)	(\$700)	(\$800)	(\$900)
(Less) Mortgage Insurance	(\$5,122)	(\$5,720)	(\$6,331)	(\$6,799)
Income Available for Mortgage	\$22,565	\$25,237	\$27,901	\$29,939
Mortgage Amount	\$393,900	\$440,500	\$487,000	\$522,600
Down Payment (homebuyer cash)	\$20,700	\$23,200	\$25,650	\$27,500
Affordable Home Price	\$414,600	\$463,700	\$512,650	\$550,100
Key Assumptions				
- Mortgage Interest Rate	4.00%	4.00%	4.00%	4.00%
- Down Payment	5.0%	5.0%	5.0%	5.0%
- Property Taxes (% of sales price)	0.30%	0.30%	0.30%	0.30%
- HOA (per month)	\$300	\$325	\$350	\$375
- Utilities (per month)	\$222	\$277	\$328	\$376
- Mortgage Insurance (% of loan amount)	1.30%	1.30%	1.30%	1.30%
*Current DPP Calculated Price	\$666,763	\$750,295	\$833,081	\$899,906

Source: All assumptions by KMA. Note: current DPP pricing schedules do not account for taxes, insurance, utilities, or HOA. Thus DPP's price schedules indicate significantly higher affordable prices than shown in this table. DPP staff do not currently keep data on actual sale prices of affordable units.

**TABLE D-5
NEXUS COST
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

TOTAL NEXUS COST PER MARKET RATE UNIT

	Affordability Gap ¹	Nexus Cost Per Market Rate Unit ³				
		Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Household Income Level						
Under 30% Area Median Income	\$367,300 ¹	\$14,600	\$13,200	\$11,900	\$15,700	\$11,800
30% to 50% Area Median Income	\$288,300 ¹	\$22,200	\$20,100	\$18,300	\$23,800	\$18,000
50% to 80% Area Median Income	\$169,300 ¹	\$13,500	\$12,200	\$11,200	\$14,500	\$11,000
80% to 120% Area Median Income	\$69,850 ²	\$3,500	\$3,100	\$2,900	\$3,700	\$2,800
120% to 140% Area Median Income	no gap ²	\$0	\$0	\$0	\$0	\$0
Total Nexus Cost Per Unit		\$53,800	\$48,600	\$44,300	\$57,700	\$43,600

TOTAL NEXUS COST PER SQUARE FOOT OF BUILDING AREA⁴

	Unit Size (SF)	Nexus Cost Per Square Foot (Net Rentable / Sellable) ⁷				
		Prototype 1: Single Family	Prototype 2: Low-Rise Townhomes	Prototype 3: Mid-Rise Condo	Prototype 4: High-Rise Condo (PUC)	Prototype 5: Rental Apartment
Household Income Level						
Under 30% Area Median Income	1,700 SF	\$8.60	\$11.00	\$11.90	\$15.70	\$13.10
30% to 50% Area Median Income	1,200 SF	\$13.10	\$16.80	\$18.30	\$23.80	\$20.00
50% to 80% Area Median Income	1,000 SF	\$7.90	\$10.20	\$11.20	\$14.50	\$12.20
80% to 120% Area Median Income	1,000 SF	\$2.10	\$2.60	\$2.90	\$3.70	\$3.10
120% to 140% Area Median Income	900 SF	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total Nexus Cost		\$31.70	\$40.60	\$44.30	\$57.70	\$48.40

Notes:

¹ Assumes affordable rental units.

² Affordability gap for moderate income households based on ownership unit (townhome) priced at 110% AMI. No affordability gap in a townhome product at 140% AMI.

³ Nexus cost per unit computed by multiplying affordable unit demand per 100 units from Table C-3 by the affordability gap and dividing by 100 units.

⁴ Computed by dividing the nexus cost per unit by the square footage of the unit.

ADDENDUM: ADDITIONAL BACKGROUND AND NOTES ON SPECIFIC ASSUMPTIONS

No Excess Supply of Affordable Housing

An assumption of this residential nexus analysis is that there is no excess supply of affordable housing available to absorb or offset new demand; therefore, new affordable units are needed to mitigate the new affordable housing demand generated by development of new market rate residential units. Based on a review of the draft *Housing Oahu: Islandwide Housing Strategy*, conditions in Honolulu are consistent with this underlying assumption. According to the *Islandwide Housing Strategy*, Oahu needs over 24,000 additional housing units to address pent-up demand and near-term projected housing needs through 2016. An estimated 75% of the demand is for units affordable to households earning less than 80% of AMI. Census data (2011 to 2013 ACS) indicates that the percentage of households spending more than 30% of their income on housing is 43% of all households in Honolulu. Households who are spending more than 30% of their income on housing are heavily those in the lower income categories.

Affordability Gap

The use of the affordability gap for establishing the nexus costs is grounded in the concept that a jurisdiction will use in-lieu fee revenues to help subsidize new affordable units needed to mitigate impacts. The nexus analysis has established that units will be needed at one or more different affordability levels and the type of unit to be delivered depends on the income/affordability level. In Honolulu, the City and County is anticipated to assist in the development of rental units for household incomes less than 80% of median and for moderate income households, ownership units are assumed to be assisted.

The units assisted by the public sector for affordable households are usually small in square foot area (for the number of bedrooms) and modest in finishes and amenities. As a result, in some communities these units are similar in physical configuration to what the market is delivering at market rate; in other communities (particularly very high income communities), they may be smaller and more modest than what the market is delivering. Parking, for example, is usually the minimum permitted by the code. In some communities where there is a wide range in land cost per acre or per unit, it may be assumed that affordable units are built on land parcels in the lower portion of the cost range. KMA tries to develop a total development cost summary that represents the lower half of the average range, but not so low as to be unrealistic.

If the affordability gap is the difference between total development cost and the affordable sales price, the question sometimes arises as to how total development cost is defined. KMA defines total development costs as including land costs, construction costs, site improvements, architectural and engineering, financing and all other indirect costs, and an allowance for an industry profit (non-profit developers receive a development fee instead).

Excess Capacity of Labor Force

In the context of economic downturns such as the recent severe recession, the question is sometimes raised as to whether there is excess capacity in the labor force to the extent that consumption impacts generated by new households will be in part, absorbed by existing jobs and workers, thus resulting in fewer net new jobs. In response, an impact analysis of this nature is a one-time impact requirement to address impacts generated over the life of the project. Recessions are temporary conditions; a healthy economy will return and the impacts will be experienced. The economic cycle also self-adjusts. Development of new residential units is not likely to occur until conditions improve or there is confidence that improved conditions are imminent. When this occurs, the improved economic condition of the households in the local area will absorb the current underutilized capacity of existing workers, employed and unemployed. By the time new units become occupied, economic conditions will have likely improved.

The Burden of Paying for Affordable Housing

Honolulu's proposed affordable housing requirements do not place all burden for the creation of affordable housing on new residential construction. The burden of affordable housing is also borne by many sectors of the economy and society. A most important source in recent years of funding for affordable housing development comes from the federal government in the form of tax credits (which result in reduced income tax payment by tax credit investors in exchange for equity funding). Additionally there are other federal grant and loan programs administered by the Department of Housing and Urban Development and other federal agencies.

Local governments play a large role in affordable housing. In addition, private sector lenders play an important role, some voluntarily and others less so with the requirements of the Community Reinvestment Act. Then there is the non-profit sector, both sponsors and developers that build much of the affordable housing.

In summary, all levels of government and many private parties, for profit and non-profit contribute to supplying affordable housing. Residential developers are not being asked to bear the burden alone any more than they are assumed to be the only source of demand or cause for needing affordable housing in our communities.

Disclaimers

This report has been prepared using the best and most recent data available at the time of the analysis. Local data and sources were used wherever possible. Major sources include the U.S. Census Bureau: 2011-2013 American Community Survey, U.S. Bureau of Labor Statistics, and the IMPLAN model. While we believe all sources utilized are sufficiently sound and accurate for the purposes of this analysis, we cannot guarantee their accuracy. Keyser Marston Associates, Inc. assumes no liability for information from these and other sources.

APPENDIX 1: MARKET SURVEY

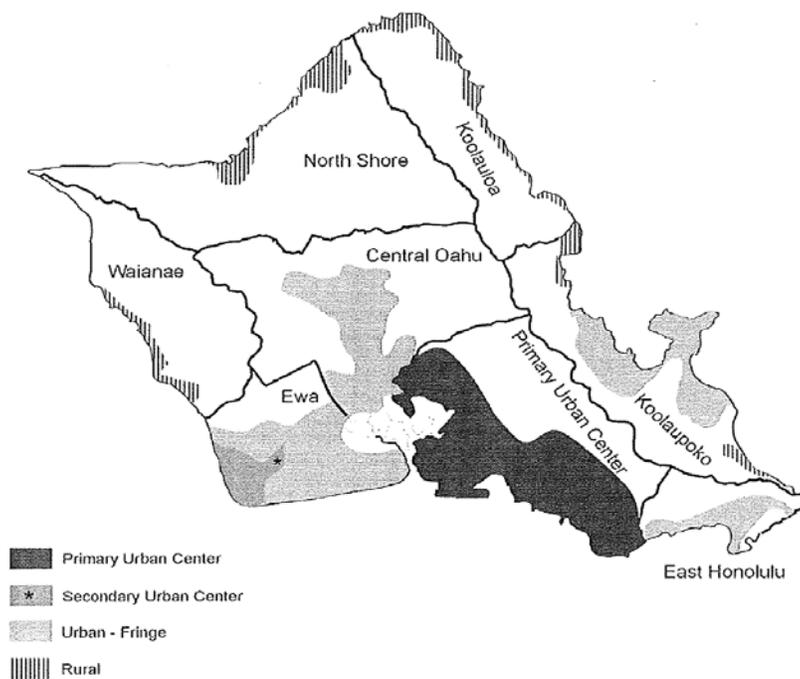
MARKET RATE PROTOTYPES & PRICING

Since the purpose of the Residential Nexus Analysis is to quantify the impacts from new market rate residential development, it is necessary to identify the types of new market rate housing that is being built in Honolulu today. Identification of the market rate housing prototypes and sale prices and rents associated with those prototypes, forms the initial input into the Nexus Analysis.

This section starts with a general overview of the Honolulu housing market as context for the types of housing being built in Honolulu, where it is being built, and how different geographic areas of the island differ from each other. It then describes the market rate prototypes selected for the Nexus Analysis and then concludes with islandwide average sale price and rent conclusions for each of the prototypes.

I. Overview of Honolulu Housing Market

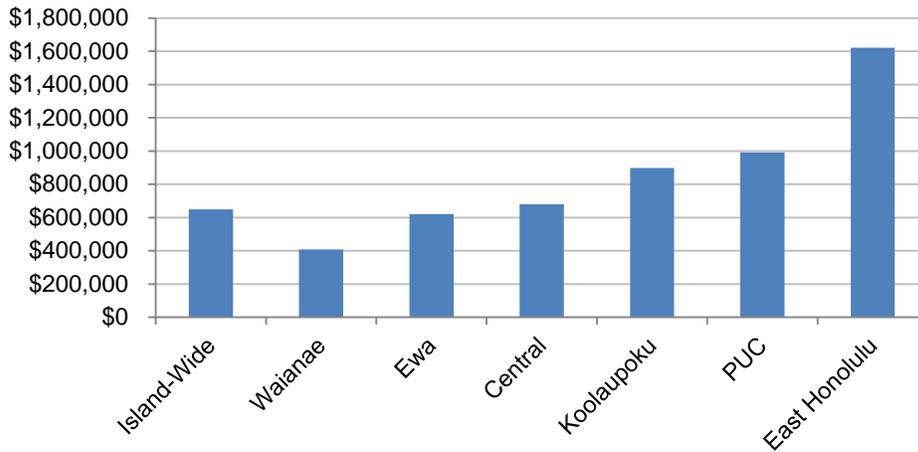
Most residential development in Honolulu is concentrated in the southern and western areas of the island. KMA has assessed the extent to which residential development characteristics and pricing vary from part of the island to another. This analysis assessed market data in relation to the City's eight Development Plan Areas. In terms of residential sales activity, the largest number of 2014 sales was in the "Primary Urban Center" (PUC) plan area followed by the "Ewa" plan area. Lower shares of residential sales were located in the remaining plan areas.



In general terms, the housing stock is older in the PUC and leeward areas of the island. On average, homes are newer in the Ewa and Central areas where growth has occurred more recently. As would be expected, housing units tend to be larger in the more suburban areas and smaller in the urban areas. Home values are highest in the East Honolulu, PUC, and Koolaupoku plan areas but this is partly a function of the larger size of homes in these areas. These three areas have the highest home values even after adjusting for unit size but the differences compared to the other plan areas are less significant.

Figure 1. Median Single Family Home Price (units built since 1990)

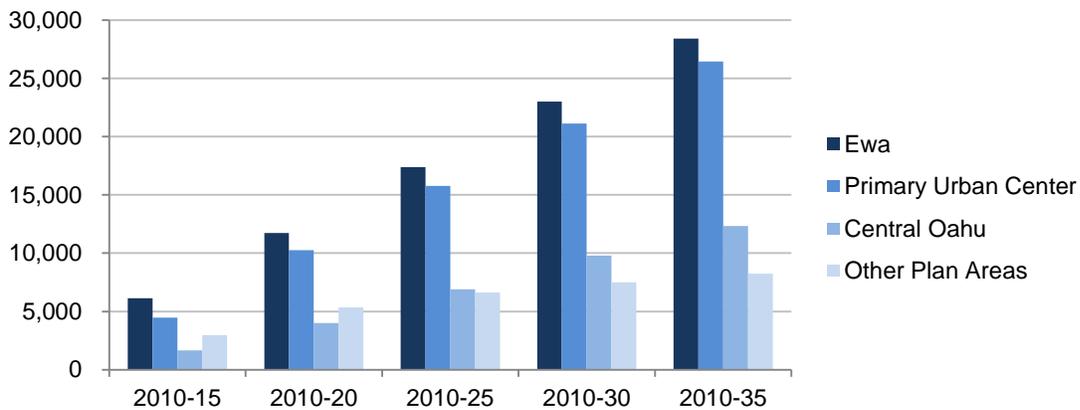
Dataquick



New residential development going forward is planned to be concentrated in the PUC, Ewa, and Central plan areas, with the largest numbers planned for Ewa. As shown in the following chart, comparatively fewer housing units are planned for the other plan areas.

Figure 2. Growth in Honolulu Housing Units (cumulative)

City and County of Honolulu



The City is also targeting residential growth in areas along the new elevated rail system in compact, mixed use development.

II. Residential Prototypes

The City and County of Honolulu, like many large municipalities with both urban and suburban areas, has a diverse and wide range of housing types. On one end of the spectrum, Honolulu has relatively large single family detached homes at low densities. On the other end of the spectrum are high-rise residential towers. It is recognized that all prototypes are not built in all areas of the island. For example, high-rises are more highly concentrated in the more urbanized areas of the PUC plan area.

With the assistance of City staff, KMA has identified five residential prototypes for the Nexus Analysis:

Figure 3. Market Rate Prototypes	Average Unit Size
Single Family Detached	1,700 square feet
Townhomes	1,200 square feet
Mid-Rise Condos	1,000 square feet
High-Rise Condos (PUC area)	1,000 square feet
Rental Apartments	900 square feet

The intent of the prototypes is to be generally representative of the types of housing being built. It is not necessary to include every variation of unit size or density.

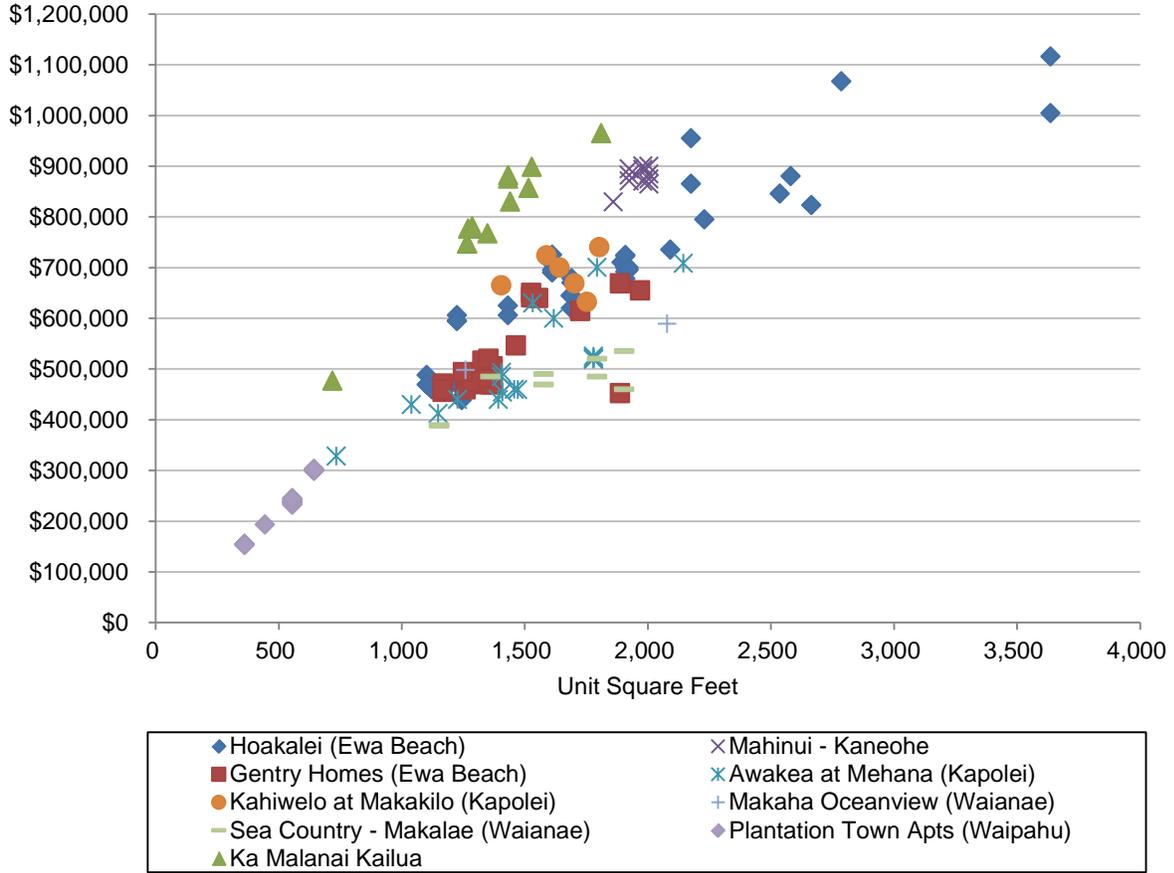
III. Market Survey

In order to estimate the current pricing of new construction projects, KMA undertook a survey of current home prices and rents throughout the island. The survey included a review of asking prices of new construction projects currently on the market, re-sale of units, and asking rental rates.

a. For-Sale Prototypes

For for-sale homes and condominiums, KMA surveyed both new construction projects and re-sales. The following chart plots 2014 sales of homes in new construction projects currently in the market. The new construction projects were identified by Hanley Wood, a third party market data provider. The survey identified projects in various parts of the island but some areas are better represented than others. Most of the projects are located in the Ewa, Central, and Waianae plan areas with a few projects in the Koolauopoku plan area.

Figure 4. Honolulu 2014 New Construction Home Sales
Hanley Wood, Dataquick





**New For-Sale
Residential Projects
Honolulu**

In an effort to have better geographic representation, as well as to increase the number of home sales for statistical validity, KMA also pulled data on re-sales of existing homes in the market. Re-sale data was focused on “newer” homes in the market (homes built since 1990) because newer homes are more likely to share price similarities to new construction projects than older homes. By including re-sales, there was a much larger number of sales to assess the market (from January to October 2014, there were over 2,000 sales of “newer” units). All geographic areas of the island were represented by that data set.

The following charts separate the sales of single family homes from condominiums. To better graphically present the data, sales of very large homes were not included in the chart. Foreclosure sales were also not included.

Figure 5. Honolulu 2014 Single Family Home Prices (built since 1990)
Dataquick

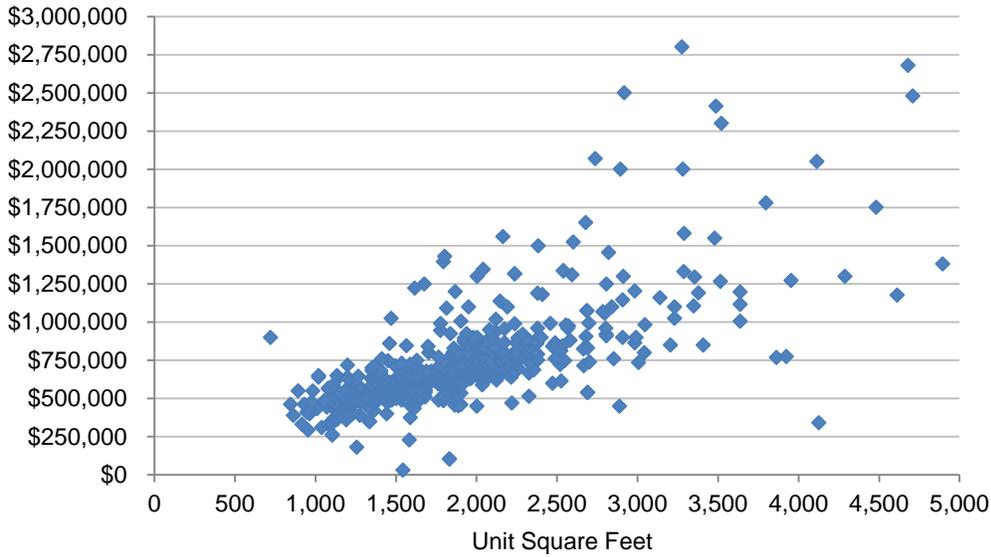
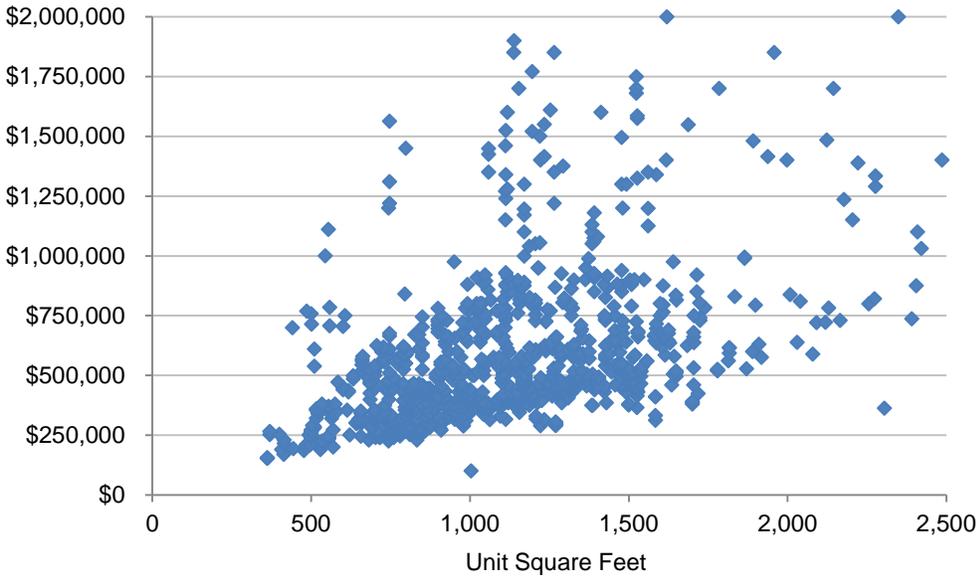


Figure 6. Honolulu 2014 Condominium Prices (built since 1990)
Dataquick



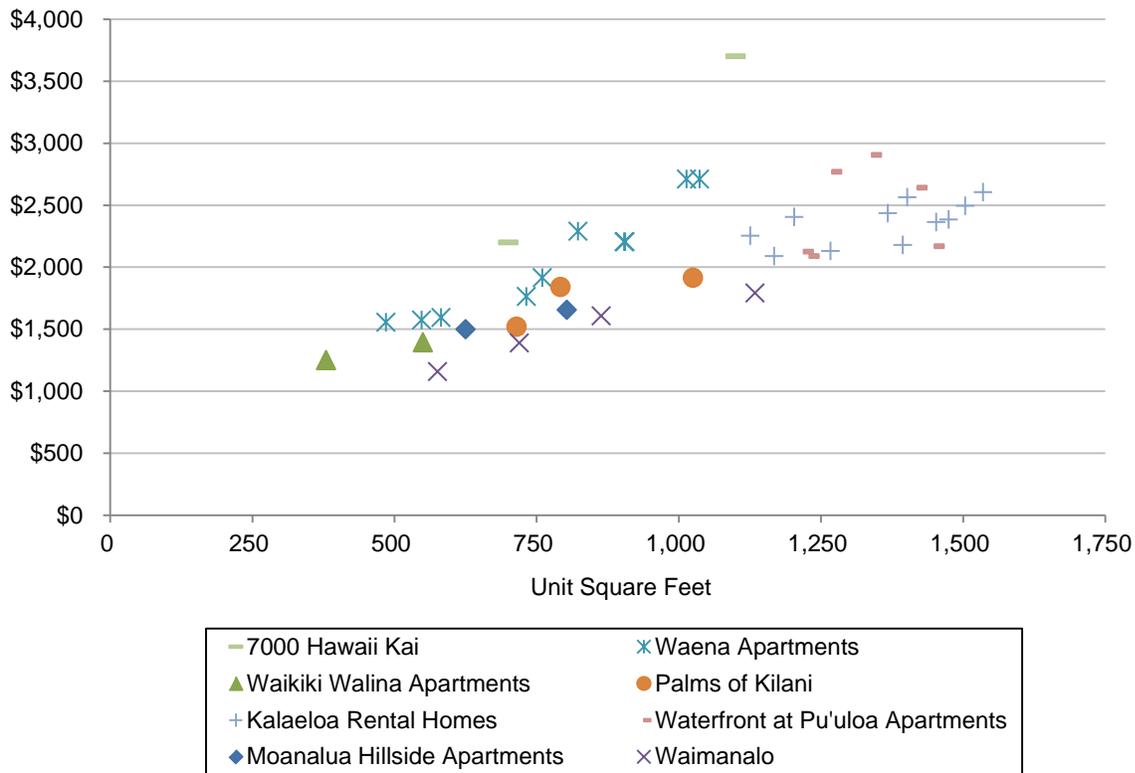
b. Rental Prototypes

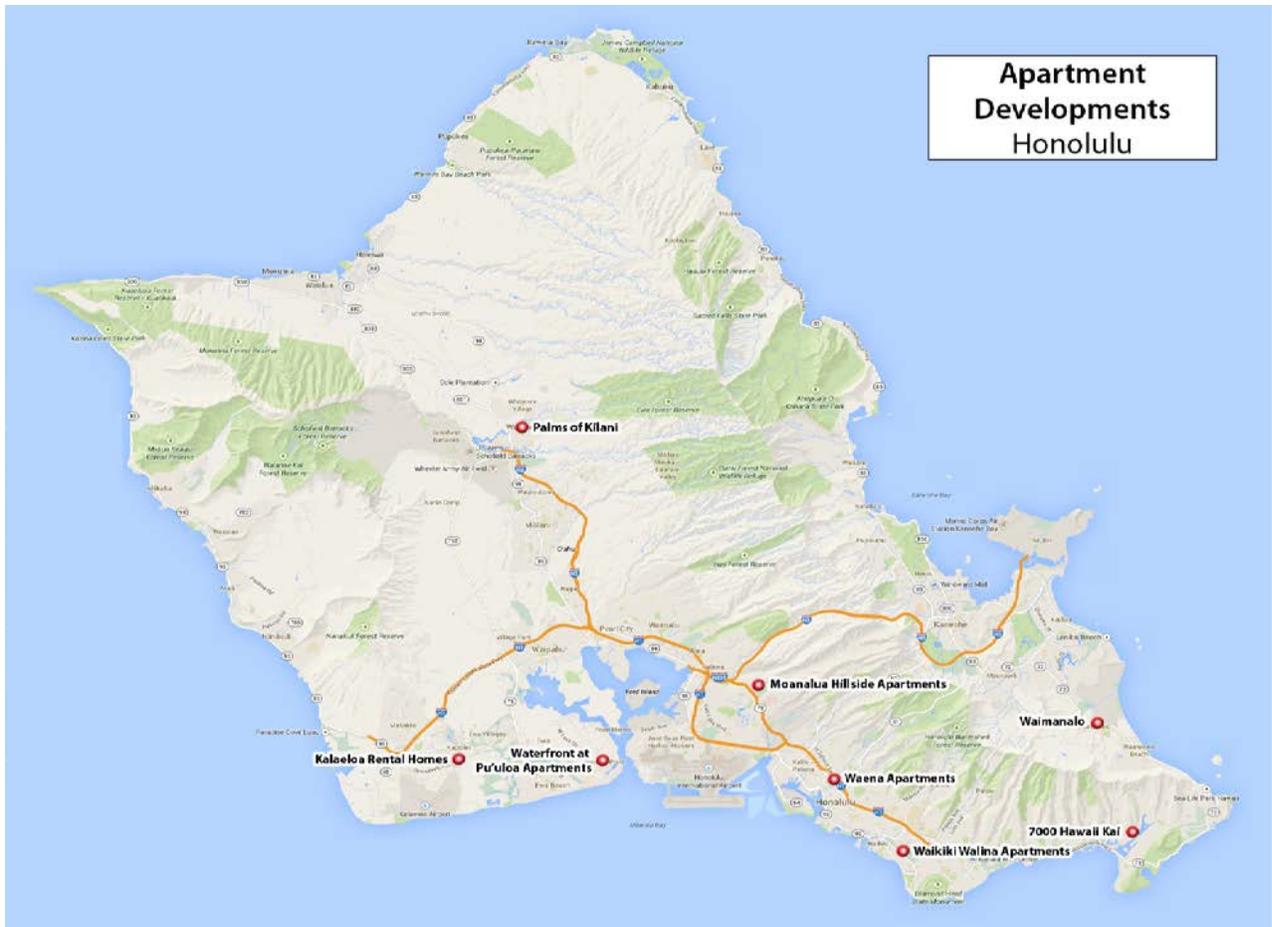
Unlike many real estate markets on the mainland, in recent years there has been little new development of market rate rental projects in Honolulu. City staff has identified two proposed apartment projects that are currently in the development pipeline – 7000 Hawaii Kai and Kapolei Lofts. Both of these projects require a rezoning of the land in order to allow residential development and, consequently, both will have market rate and affordable units.

- *7000 Hawaii Kai*. This 269-unit project is proposed to consist of two ten-story buildings with units ranging from 700 to 1,100 square feet. According to a Pacific Business News article, the market rate rents are expected to range from \$2,200 to \$3,700/month.
- *Kapolei Lofts*. This project is proposed to consist of 499 rental units including units at 80% and 140% of AMI. According to an article in the Pacific Business News, this project will be Honolulu's first Class A new construction apartment project.

In addition, KMA surveyed existing apartment developments for asking rents. Even though some of these properties have been recently renovated, the rents for new construction projects would likely be somewhat higher than the rents from older properties on the market given the premium that many renters are willing to pay for modern amenities and unit layouts.

Figure 7. Honolulu Apartment Rents
Project websites, other internet research





IV. Prototype Pricing

The sale prices and rents for the five market rate prototypes have been estimated by KMA based on the market survey. The rents and prices for the apartments and the lower density for-sale prototypes have been estimated based on market averages. Since the City’s inclusionary program will be an islandwide requirement, the use of averages is appropriate for purposes of the Nexus Analysis. The pricing for the High-Rise Condos is the one prototype not based on an islandwide average. All the comparable sale price data used to estimate the high-rise prototype was from developments in the PUC plan area, where most high-rise projects are currently being built.

As shown in the following table, the for-sale prototypes are estimated to have average sale prices ranging from \$525,000 for the Mid-Rise Condo Prototype to \$700,000 for both the Single Detached Home and High-Rise Condo Prototypes.

Figure 7. Summary of Market Rate Residential Prototypes

	For-Sale Prototypes				Rental
	Prototype 1	Prototype 2	Prototype 3	Prototype 4	Prototype 5
	Single Family Detached Homes	Low Rise Townhomes	Mid-Rise Condos	High-Rise Condos (PUC)	Rental Apartments
Average Unit Size	1,700 sf	1,200 sf	1,000 sf	1,000 sf	900 sf
Market Rate Price/Rent	\$700,000	\$575,000	\$525,000	\$700,000	\$2,500 /mo.
\$/SF	\$412 /sf	\$479 /sf	\$525 /sf	\$700 /sf	\$2.78 /sf

Source: Estimated by KMA based on market survey

APPENDIX 2: SUPPORTING TECHNICAL TABLES

**APPENDIX 2, TABLE 1
 WORKER OCCUPATION DISTRIBUTION, 2013
 SERVICES TO HOUSEHOLDS EARNING \$75,000-\$100,000, RESIDENT SERVICES
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI**

Major Occupations (2% or more)	Worker Occupation Distribution ¹ Services to Households Earning \$75,000-\$100,000
Management Occupations	4.2%
Business and Financial Operations Occupations	4.5%
Education, Training, and Library Occupations	2.8%
Healthcare Practitioners and Technical Occupations	7.7%
Healthcare Support Occupations	4.1%
Food Preparation and Serving Related Occupations	12.8%
Building and Grounds Cleaning and Maintenance Occupations	5.7%
Personal Care and Service Occupations	5.1%
Sales and Related Occupations	13.7%
Office and Administrative Support Occupations	16.3%
Installation, Maintenance, and Repair Occupations	3.7%
Transportation and Material Moving Occupations	5.4%
All Other Worker Occupations - Services to Households Earning \$75,000-\$100,000	<u>14.1%</u>
INDUSTRY TOTAL	100.0%

¹ Distribution of employment by industry is per the IMPLAN model and the distribution of occupational employment within those industries is based on the Bureau of Labor Statistics Occupational Employment Survey.

**APPENDIX 2, TABLE 2
 AVERAGE ANNUAL WORKER COMPENSATION, 2013
 SERVICES TO HOUSEHOLDS EARNING \$75,000-\$100,000
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI**

Occupation ³	2013 Avg. Compensation ¹	% of Total Occupation Group ²	% of Total Households Earning \$75,000-\$100,000, Resident Services Workers
<i>Page 1 of 4</i>			
<i>Management Occupations</i>			
Chief Executives	\$150,500	3.5%	0.2%
General and Operations Managers	\$100,200	32.7%	1.4%
Sales Managers	\$81,100	5.4%	0.2%
Administrative Services Managers	\$68,500	4.1%	0.2%
Financial Managers	\$95,600	8.2%	0.3%
Food Service Managers	\$48,500	4.6%	0.2%
Medical and Health Services Managers	\$109,600	6.7%	0.3%
Property, Real Estate, and Community Association Managers	\$52,400	9.6%	0.4%
Managers, All Other	\$91,800	4.4%	0.2%
All other Management Occupations (Avg. All Categories)	<u>\$90,600</u>	<u>20.9%</u>	<u>0.9%</u>
Weighted Mean Annual Wage	\$90,600	100.0%	4.2%
<i>Business and Financial Operations Occupations</i>			
Claims Adjusters, Examiners, and Investigators	\$62,100	6.1%	0.3%
Compliance Officers	\$65,500	3.0%	0.1%
Human Resources Specialists	\$58,200	5.5%	0.2%
Labor Relations Specialists	\$53,900	3.2%	0.1%
Management Analysts	\$77,100	6.2%	0.3%
Training and Development Specialists	\$65,600	3.3%	0.1%
Market Research Analysts and Marketing Specialists	\$57,700	6.0%	0.3%
Business Operations Specialists, All Other	\$67,200	13.2%	0.6%
Accountants and Auditors	\$62,200	17.1%	0.8%
Financial Analysts	\$72,800	4.9%	0.2%
Personal Financial Advisors	\$98,700	5.5%	0.2%
Loan Officers	\$62,000	4.5%	0.2%
All Other Business and Financial Operations Occupations (Avg. All Categories)	<u>\$66,700</u>	<u>21.6%</u>	<u>1.0%</u>
Weighted Mean Annual Wage	\$66,700	100.0%	4.5%
<i>Education, Training, and Library Occupations</i>			
Vocational Education Teachers, Postsecondary	\$53,200	3.9%	0.1%
Preschool Teachers, Except Special Education	\$32,400	15.8%	0.4%
Elementary School Teachers, Except Special Education	\$54,800	7.6%	0.2%
Middle School Teachers, Except Special and Career/Technical Education	\$54,500	3.4%	0.1%
Secondary School Teachers, Except Special and Career/Technical Education	\$56,500	5.2%	0.1%
Self-Enrichment Education Teachers	\$46,900	9.4%	0.3%
Substitute Teachers	\$44,700	4.2%	0.1%
Teachers and Instructors, All Other, Except Substitute Teachers	\$50,000	6.8%	0.2%
Teacher Assistants	\$27,800	15.6%	0.4%
All Other Education, Training, and Library Occupations (Avg. All Categories)	<u>\$42,000</u>	<u>28.3%</u>	<u>0.8%</u>
Weighted Mean Annual Wage	\$42,000	100.0%	2.8%

APPENDIX 2, TABLE 2
 AVERAGE ANNUAL WORKER COMPENSATION, 2013
 SERVICES TO HOUSEHOLDS EARNING \$75,000-\$100,000
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI

Occupation ³	2013 Avg. Compensation ¹	% of Total Occupation Group ²	% of Total Households Earning \$75,000-\$100,000, Resident Services Workers
<i>Page 2 of 4</i>			
<i>Healthcare Practitioners and Technical Occupations</i>			
Pharmacists	\$114,900	4.2%	0.3%
Physicians and Surgeons, All Other	\$206,800	4.5%	0.3%
Registered Nurses	\$88,500	31.0%	2.4%
Dental Hygienists	\$70,700	3.6%	0.3%
Pharmacy Technicians	\$36,700	5.5%	0.4%
Licensed Practical and Licensed Vocational Nurses	\$46,700	8.6%	0.7%
All Other Healthcare Practitioners and Technical Occupations (Avg. All Categories)	<u>\$87,300</u>	<u>42.6%</u>	<u>3.3%</u>
Weighted Mean Annual Wage	\$87,300	100.0%	7.7%
<i>Healthcare Support Occupations</i>			
Home Health Aides	\$22,900	20.2%	0.8%
Nursing Assistants	\$29,100	30.5%	1.3%
Dental Assistants	\$33,300	10.8%	0.4%
Medical Assistants	\$33,700	18.4%	0.8%
Phlebotomists	\$34,200	3.1%	0.1%
All Other Healthcare Support Occupations (Avg. All Categories)	<u>\$29,300</u>	<u>17.0%</u>	<u>0.7%</u>
Weighted Mean Annual Wage	\$29,300	100.0%	4.1%
<i>Food Preparation and Serving Related Occupations</i>			
First-Line Supervisors of Food Preparation and Serving Workers	\$34,700	7.0%	0.9%
Cooks, Fast Food	\$19,800	4.6%	0.6%
Cooks, Restaurant	\$26,000	8.9%	1.1%
Food Preparation Workers	\$23,300	6.7%	0.9%
Bartenders	\$29,800	5.1%	0.7%
Combined Food Preparation and Serving Workers, Including Fast Food	\$19,700	25.9%	3.3%
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	\$21,500	3.8%	0.5%
Waiters and Waitresses	\$26,900	20.7%	2.6%
Dining Room and Cafeteria Attendants and Bartender Helpers	\$24,600	3.2%	0.4%
Dishwashers	\$22,900	4.1%	0.5%
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	\$23,500	3.1%	0.4%
All Other Food Preparation and Serving Related Occupations (Avg. All Categories)	<u>\$24,400</u>	<u>7.0%</u>	<u>0.9%</u>
Weighted Mean Annual Wage	\$24,400	100.0%	12.8%
<i>Building and Grounds Cleaning and Maintenance Occupations</i>			
First-Line Supervisors of Housekeeping and Janitorial Workers	\$40,200	3.4%	0.2%
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	\$25,300	50.8%	2.9%
Maids and Housekeeping Cleaners	\$32,400	11.6%	0.7%
Landscaping and Groundskeeping Workers	\$28,800	25.4%	1.4%
All Other Building and Grounds Cleaning and Maintenance Occupations (Avg. All	<u>\$27,700</u>	<u>8.8%</u>	<u>0.5%</u>
Weighted Mean Annual Wage	\$27,700	100.0%	5.7%

APPENDIX 2, TABLE 2
AVERAGE ANNUAL WORKER COMPENSATION, 2013
SERVICES TO HOUSEHOLDS EARNING \$75,000-\$100,000
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI

Occupation ³	2013 Avg. Compensation ¹	% of Total Occupation Group ²	% of Total Households Earning \$75,000-\$100,000, Resident Services Workers
<i>Personal Care and Service Occupations</i>			
First-Line Supervisors of Personal Service Workers	\$42,000	3.7%	0.2%
Nonfarm Animal Caretakers	\$25,100	4.5%	0.2%
Amusement and Recreation Attendants	\$20,800	6.4%	0.3%
Hairdressers, Hairstylists, and Cosmetologists	\$36,400	14.4%	0.7%
Manicurists and Pedicurists	\$20,000	3.1%	0.2%
Childcare Workers	\$19,100	13.6%	0.7%
Personal Care Aides	\$25,500	26.0%	1.3%
Fitness Trainers and Aerobics Instructors	\$32,000	5.3%	0.3%
Recreation Workers	\$34,400	4.9%	0.2%
All Other Personal Care and Service Occupations (Avg. All Categories)	<u>\$27,400</u>	<u>18.3%</u>	<u>0.9%</u>
Weighted Mean Annual Wage	\$27,400	100.0%	5.1%
<i>Sales and Related Occupations</i>			
First-Line Supervisors of Retail Sales Workers	\$48,500	9.2%	1.3%
Cashiers	\$22,500	24.6%	3.4%
Counter and Rental Clerks	\$29,100	4.8%	0.7%
Retail Salespersons	\$25,500	34.9%	4.8%
Securities, Commodities, and Financial Services Sales Agents	\$77,000	3.2%	0.4%
Sales Representatives, Services, All Other	\$48,400	3.8%	0.5%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scie	\$44,600	5.8%	0.8%
All Other Sales and Related Occupations (Avg. All Categories)	<u>\$31,500</u>	<u>13.7%</u>	<u>1.9%</u>
Weighted Mean Annual Wage	\$31,500	100.0%	13.7%
<i>Office and Administrative Support Occupations</i>			
First-Line Supervisors of Office and Administrative Support Workers	\$51,400	6.7%	1.1%
Bookkeeping, Accounting, and Auditing Clerks	\$37,300	7.3%	1.2%
Customer Service Representatives	\$34,500	10.9%	1.8%
Receptionists and Information Clerks	\$29,000	6.8%	1.1%
Stock Clerks and Order Fillers	\$26,500	10.0%	1.6%
Executive Secretaries and Executive Administrative Assistants	\$50,700	3.2%	0.5%
Medical Secretaries	\$37,200	3.9%	0.6%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	\$38,300	10.0%	1.6%
Office Clerks, General	\$31,300	13.2%	2.1%
All Other Office and Administrative Support Occupations (Avg. All Categories)	<u>\$35,500</u>	<u>28.0%</u>	<u>4.6%</u>
Weighted Mean Annual Wage	\$35,500	100.0%	16.3%
<i>Installation, Maintenance, and Repair Occupations</i>			
First-Line Supervisors of Mechanics, Installers, and Repairers	\$71,900	7.9%	0.3%
Telecommunications Equipment Installers and Repairers, Except Line Installers	\$60,300	3.6%	0.1%
Automotive Body and Related Repairers	\$47,900	3.9%	0.1%
Automotive Service Technicians and Mechanics	\$47,200	16.0%	0.6%
Bus and Truck Mechanics and Diesel Engine Specialists	\$63,200	3.6%	0.1%
Maintenance and Repair Workers, General	\$42,400	33.5%	1.2%
All Other Installation, Maintenance, and Repair Occupations (Avg. All Categories)	<u>\$49,300</u>	<u>31.5%</u>	<u>1.2%</u>
Weighted Mean Annual Wage	\$49,300	100.0%	3.7%

APPENDIX 2, TABLE 2
 AVERAGE ANNUAL WORKER COMPENSATION, 2013
 SERVICES TO HOUSEHOLDS EARNING \$75,000-\$100,000
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI

Occupation ³	2013 Avg. Compensation ¹	% of Total Occupation Group ²	% of Total Households Earning \$75,000-\$100,000, Resident Services Workers
<i>Transportation and Material Moving Occupations</i>			
Bus Drivers, School or Special Client	\$34,500	7.1%	0.4%
Driver/Sales Workers	\$29,400	7.7%	0.4%
Heavy and Tractor-Trailer Truck Drivers	\$44,500	11.3%	0.6%
Light Truck or Delivery Services Drivers	\$30,600	8.7%	0.5%
Taxi Drivers and Chauffeurs	\$26,800	4.1%	0.2%
Parking Lot Attendants	\$21,700	4.2%	0.2%
Industrial Truck and Tractor Operators	\$40,100	3.3%	0.2%
Cleaners of Vehicles and Equipment	\$25,000	5.5%	0.3%
Laborers and Freight, Stock, and Material Movers, Hand	\$30,900	23.1%	1.2%
Packers and Packagers, Hand	\$21,700	7.7%	0.4%
All Other Transportation and Material Moving Occupations (Avg. All Categories)	<u>\$31,300</u>	<u>17.3%</u>	<u>0.9%</u>
Weighted Mean Annual Wage	\$31,300	100.0%	5.4%
			85.9%

¹ The methodology utilized by the Bureau of Labor Statistics (BLS) generally assumes hourly employees are employed full-time. Annual compensation is calculated by BLS by multiplying hourly wages by 2,080 hours per year (40 hours per week and 52 weeks).

² Occupation percentages are based on the 2013 National Industry - Specific Occupational Employment survey compiled by the Bureau of Labor Statistics. Wages are based on the 2013 Occupational Employment Survey data specific to Honolulu from the Bureau of Labor statistics.

³ Including occupations representing 3% or more of the major occupation group.

**APPENDIX 2, TABLE 3
 WORKER OCCUPATION DISTRIBUTION, 2013
 SERVICES TO HOUSEHOLDS EARNING \$100,000-150,000, RESIDENT SERVICES
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI**

Major Occupations (2% or more)	Worker Occupation Distribution ¹ Services to Households Earning \$100,000-\$150,000
Management Occupations	4.2%
Business and Financial Operations Occupations	4.5%
Education, Training, and Library Occupations	3.3%
Healthcare Practitioners and Technical Occupations	7.4%
Healthcare Support Occupations	3.9%
Food Preparation and Serving Related Occupations	12.7%
Building and Grounds Cleaning and Maintenance Occupations	5.6%
Personal Care and Service Occupations	5.2%
Sales and Related Occupations	14.1%
Office and Administrative Support Occupations	16.2%
Installation, Maintenance, and Repair Occupations	3.5%
Transportation and Material Moving Occupations	5.4%
All Other Worker Occupations - Services to Households Earning \$100,000-\$150,000	<u>14.0%</u>
INDUSTRY TOTAL	100.0%

¹ Distribution of employment by industry is per the IMPLAN model and the distribution of occupational employment within those industries is based on the Bureau of Labor Statistics Occupational Employment Survey.

**APPENDIX 2, TABLE 4
AVERAGE ANNUAL WORKER COMPENSATION, 2013
SERVICES TO HOUSEHOLDS EARNING \$100,000-\$150,000
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

Occupation ³	2013 Avg. Compensation ¹	% of Total Occupation Group ²	% of Total Households Earning \$100,000-150,000, Resident Services Workers
Page 1 of 4			
<i>Management Occupations</i>			
Chief Executives	\$150,500	3.6%	0.1%
General and Operations Managers	\$100,200	33.1%	1.4%
Sales Managers	\$81,100	5.3%	0.2%
Administrative Services Managers	\$68,500	4.1%	0.2%
Financial Managers	\$95,600	8.4%	0.3%
Food Service Managers	\$48,500	4.6%	0.2%
Medical and Health Services Managers	\$109,600	6.4%	0.3%
Property, Real Estate, and Community Association Managers	\$52,400	7.8%	0.3%
Social and Community Service Managers	\$58,000	3.2%	0.1%
Managers, All Other	\$91,800	4.5%	0.2%
All other Management Occupations (Avg. All Categories)	<u>\$90,200</u>	<u>18.9%</u>	<u>0.8%</u>
	Weighted Mean Annual Wage	\$90,200	100.0%
<i>Business and Financial Operations Occupations</i>			
Claims Adjusters, Examiners, and Investigators	\$62,100	6.1%	0.3%
Compliance Officers	\$65,500	3.0%	0.1%
Human Resources Specialists	\$58,200	5.4%	0.2%
Labor Relations Specialists	\$53,900	3.3%	0.1%
Management Analysts	\$77,100	6.2%	0.3%
Training and Development Specialists	\$65,600	3.4%	0.2%
Market Research Analysts and Marketing Specialists	\$57,700	5.8%	0.3%
Business Operations Specialists, All Other	\$67,200	13.3%	0.6%
Accountants and Auditors	\$62,200	16.7%	0.7%
Financial Analysts	\$72,800	5.0%	0.2%
Personal Financial Advisors	\$98,700	5.8%	0.3%
Loan Officers	\$62,000	4.7%	0.2%
All Other Business and Financial Operations Occupations (Avg. All Categories)	<u>\$66,900</u>	<u>21.2%</u>	<u>1.0%</u>
	Weighted Mean Annual Wage	\$66,900	100.0%
<i>Education, Training, and Library Occupations</i>			
Vocational Education Teachers, Postsecondary	\$53,200	3.9%	0.1%
Preschool Teachers, Except Special Education	\$32,400	16.1%	0.5%
Elementary School Teachers, Except Special Education	\$54,800	7.4%	0.2%
Middle School Teachers, Except Special and Career/Technical Education	\$54,500	3.3%	0.1%
Secondary School Teachers, Except Special and Career/Technical Education	\$56,500	5.1%	0.2%
Self-Enrichment Education Teachers	\$46,900	9.1%	0.3%
Substitute Teachers	\$44,700	4.0%	0.1%
Teachers and Instructors, All Other, Except Substitute Teachers	\$50,000	6.8%	0.2%
Teacher Assistants	\$27,800	15.5%	0.5%
All Other Education, Training, and Library Occupations (Avg. All Categories)	<u>\$41,800</u>	<u>28.8%</u>	<u>0.9%</u>
	Weighted Mean Annual Wage	\$41,800	100.0%

**APPENDIX 2, TABLE 4
 AVERAGE ANNUAL WORKER COMPENSATION, 2013
 SERVICES TO HOUSEHOLDS EARNING \$100,000-\$150,000
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI**

Occupation ³	2013 Avg. Compensation ¹	% of Total Occupation Group ²	% of Total Households Earning \$100,000-150,000, Resident Services Workers
<i>Page 2 of 4</i>			
<i>Healthcare Practitioners and Technical Occupations</i>			
Pharmacists	\$114,900	4.5%	0.3%
Physicians and Surgeons, All Other	\$206,800	4.4%	0.3%
Registered Nurses	\$88,500	30.7%	2.3%
Dental Hygienists	\$70,700	3.6%	0.3%
Pharmacy Technicians	\$36,700	6.0%	0.4%
Licensed Practical and Licensed Vocational Nurses	\$46,700	8.5%	0.6%
All Other Healthcare Practitioners and Technical Occupations (Avg. All Categories)	<u>\$87,000</u>	<u>42.2%</u>	<u>3.1%</u>
Weighted Mean Annual Wage	\$87,000	100.0%	7.4%
<i>Healthcare Support Occupations</i>			
Home Health Aides	\$22,900	20.7%	0.8%
Nursing Assistants	\$29,100	30.3%	1.2%
Dental Assistants	\$33,300	10.7%	0.4%
Medical Assistants	\$33,700	18.1%	0.7%
Phlebotomists	\$34,200	3.0%	0.1%
All Other Healthcare Support Occupations (Avg. All Categories)	<u>\$29,300</u>	<u>17.2%</u>	<u>0.7%</u>
Weighted Mean Annual Wage	\$29,300	100.0%	3.9%
<i>Food Preparation and Serving Related Occupations</i>			
First-Line Supervisors of Food Preparation and Serving Workers	\$34,700	7.0%	0.9%
Cooks, Fast Food	\$19,800	4.6%	0.6%
Cooks, Restaurant	\$26,000	8.9%	1.1%
Food Preparation Workers	\$23,300	6.8%	0.9%
Bartenders	\$29,800	5.1%	0.7%
Combined Food Preparation and Serving Workers, Including Fast Food	\$19,700	25.9%	3.3%
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	\$21,500	3.8%	0.5%
Waiters and Waitresses	\$26,900	20.6%	2.6%
Dining Room and Cafeteria Attendants and Bartender Helpers	\$24,600	3.2%	0.4%
Dishwashers	\$22,900	4.1%	0.5%
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	\$23,500	3.1%	0.4%
All Other Food Preparation and Serving Related Occupations (Avg. All Categories)	<u>\$24,400</u>	<u>7.0%</u>	<u>0.9%</u>
Weighted Mean Annual Wage	\$24,400	100.0%	12.7%
<i>Building and Grounds Cleaning and Maintenance Occupations</i>			
First-Line Supervisors of Housekeeping and Janitorial Workers	\$40,200	3.4%	0.2%
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	\$52,200	3.0%	0.2%
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	\$25,300	51.0%	2.9%
Maids and Housekeeping Cleaners	\$32,400	11.3%	0.6%
Landscaping and Groundskeeping Workers	\$28,800	25.5%	1.4%
All Other Building and Grounds Cleaning and Maintenance Occupations (Avg. All C	<u>\$28,500</u>	<u>5.9%</u>	<u>0.3%</u>
Weighted Mean Annual Wage	\$28,500	100.0%	5.6%

**APPENDIX 2, TABLE 4
AVERAGE ANNUAL WORKER COMPENSATION, 2013
SERVICES TO HOUSEHOLDS EARNING \$100,000-\$150,000
RESIDENTIAL NEXUS ANALYSIS
HONOLULU, HI**

Occupation ³	2013 Avg. Compensation ¹	% of Total Occupation Group ²	% of Total Households Earning \$100,000-150,000, Resident Services Workers
<i>Personal Care and Service Occupations</i>			
First-Line Supervisors of Personal Service Workers	\$42,000	3.7%	0.2%
Nonfarm Animal Caretakers	\$25,100	4.6%	0.2%
Amusement and Recreation Attendants	\$20,800	6.3%	0.3%
Hairdressers, Hairstylists, and Cosmetologists	\$36,400	13.5%	0.7%
Childcare Workers	\$19,100	15.4%	0.8%
Personal Care Aides	\$25,500	25.7%	1.3%
Fitness Trainers and Aerobics Instructors	\$32,000	5.3%	0.3%
Recreation Workers	\$34,400	4.8%	0.3%
All Other Personal Care and Service Occupations (Avg. All Categories)	<u>\$27,400</u>	<u>20.8%</u>	<u>1.1%</u>
Weighted Mean Annual Wage	\$27,400	100.0%	5.2%
<i>Sales and Related Occupations</i>			
First-Line Supervisors of Retail Sales Workers	\$48,500	9.6%	1.4%
Cashiers	\$22,500	25.6%	3.6%
Counter and Rental Clerks	\$29,100	4.2%	0.6%
Retail Salespersons	\$25,500	36.7%	5.2%
Securities, Commodities, and Financial Services Sales Agents	\$77,000	3.3%	0.5%
Sales Representatives, Services, All Other	\$48,400	3.6%	0.5%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scier	\$44,600	4.5%	0.6%
All Other Sales and Related Occupations (Avg. All Categories)	<u>\$31,200</u>	<u>12.4%</u>	<u>1.7%</u>
Weighted Mean Annual Wage	\$31,200	100.0%	14.1%
<i>Office and Administrative Support Occupations</i>			
First-Line Supervisors of Office and Administrative Support Workers	\$51,400	6.7%	1.1%
Bookkeeping, Accounting, and Auditing Clerks	\$37,300	7.1%	1.2%
Tellers	\$26,000	3.1%	0.5%
Customer Service Representatives	\$34,500	10.9%	1.8%
Receptionists and Information Clerks	\$29,000	6.6%	1.1%
Stock Clerks and Order Fillers	\$26,500	10.6%	1.7%
Executive Secretaries and Executive Administrative Assistants	\$50,700	3.2%	0.5%
Medical Secretaries	\$37,200	3.7%	0.6%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	\$38,300	9.8%	1.6%
Office Clerks, General	\$31,300	13.0%	2.1%
All Other Office and Administrative Support Occupations (Avg. All Categories)	<u>\$35,100</u>	<u>25.2%</u>	<u>4.1%</u>
Weighted Mean Annual Wage	\$35,100	100.0%	16.2%
<i>Installation, Maintenance, and Repair Occupations</i>			
First-Line Supervisors of Mechanics, Installers, and Repairers	\$71,900	8.0%	0.3%
Telecommunications Equipment Installers and Repairers, Except Line Installers	\$60,300	3.4%	0.1%
Automotive Body and Related Repairers	\$47,900	4.1%	0.1%
Automotive Service Technicians and Mechanics	\$47,200	17.3%	0.6%
Bus and Truck Mechanics and Diesel Engine Specialists	\$63,200	3.6%	0.1%
Maintenance and Repair Workers, General	\$42,400	30.9%	1.1%
Installation, Maintenance, and Repair Workers, All Other	\$54,500	3.1%	0.1%
All Other Installation, Maintenance, and Repair Occupations (Avg. All Categories)	<u>\$49,700</u>	<u>29.5%</u>	<u>1.0%</u>
Weighted Mean Annual Wage	\$49,700	100.0%	3.5%

**APPENDIX 2, TABLE 4
 AVERAGE ANNUAL WORKER COMPENSATION, 2013
 SERVICES TO HOUSEHOLDS EARNING \$100,000-\$150,000
 RESIDENTIAL NEXUS ANALYSIS
 HONOLULU, HI**

Occupation ³	2013 Avg. Compensation ¹	% of Total Occupation Group ²	% of Total Households Earning \$100,000-150,000, Resident Services Workers
<i>Transportation and Material Moving Occupations</i>			
Bus Drivers, School or Special Client	\$34,500	7.9%	0.4%
Driver/Sales Workers	\$29,400	7.4%	0.4%
Heavy and Tractor-Trailer Truck Drivers	\$44,500	10.9%	0.6%
Light Truck or Delivery Services Drivers	\$30,600	8.6%	0.5%
Taxi Drivers and Chauffeurs	\$26,800	4.4%	0.2%
Parking Lot Attendants	\$21,700	4.3%	0.2%
Industrial Truck and Tractor Operators	\$40,100	3.1%	0.2%
Cleaners of Vehicles and Equipment	\$25,000	5.5%	0.3%
Laborers and Freight, Stock, and Material Movers, Hand	\$30,900	22.4%	1.2%
Packers and Packagers, Hand	\$21,700	7.8%	0.4%
All Other Transportation and Material Moving Occupations (Avg. All Categories)	<u>\$31,300</u>	<u>17.6%</u>	<u>0.9%</u>
Weighted Mean Annual Wage	\$31,300	100.0%	5.4%
			<hr/> <hr/> 86.0%

¹ The methodology utilized by the Bureau of Labor Statistics (BLS) generally assumes hourly employees are employed full-time. Annual compensation is calculated by BLS by multiplying hourly wages by 2,080 hours per year (40 hours per week and 52 weeks).

² Occupation percentages are based on the 2013 National Industry - Specific Occupational Employment survey compiled by the Bureau of Labor Statistics. Wages are based on the 2013 Occupational Employment Survey data specific to Honolulu from the Bureau of Labor statistics.

³ Including occupations representing 3% or more of the major occupation group.