

BROWARD COUNTY RESIDENTIAL LINKAGE FEE NEXUS STUDY

2019

Prepared for

Broward County

Board of County Commissioners





FLORIDA INTERNATIONAL UNIVERSITY

The **Metropolitan Center at Florida International University** (FIU) is the leading urban “think tank” in South Florida established in 1997 as an applied research unit within the Stephen J. Green the School of International and Public Affairs (SIPA). The Center frequently partners with government agencies, private firms, and non-profit organizations to build avenues for positive growth. The FIU Metropolitan Center brings an established applied research capacity to local government planning efforts utilizing cutting-edge research and quantitative data analysis tools and techniques. Our highly qualified staff ensures the timely and reliable delivery of the proposed services. The Metropolitan Center provides on-going support to its municipal clients above and beyond the negotiated scope of services. Our research has served as catalyst for major policy changes and projects in the area of housing, transportation, social and health services, quality improvement and organizational development.

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EXECUTIVE SUMMARY

Background

The *Broward County Residential Linkage Fee Nexus Study* prepared on behalf of the Board of County Commissioners, Broward County, Florida by the Florida International University (FIU) Metropolitan Center serves as an additional element to the 2019 *Broward County Housing Linkage Fee Nexus Study* which focused on the affordable housing impacts of new commercial development in the County. The purpose of this study is to determine whether there exists a reasonable nexus between the construction of new (residential) buildings in Broward County and the demand for affordable housing created by the residents that will reside in these new units.

In order to establish a linkage fee, counties and cities must first conduct a “nexus” study. The residential nexus analysis establishes maximum supportable impact fee levels applicable to each residential development type classification. The underlying concept of the residential nexus analysis is that newly constructed units will represent net new households in Broward County. These households represent new income in the County that will consume goods and services, either through purchases of goods and services or “consumption” of governmental services. New consumption generates new local jobs, of which, a significant portion of the new jobs will be low wage. Low wage jobs relate to lower income households that cannot afford market rate units and, subsequently, will be in need of new affordable housing in Broward County.

The nexus cost is the amount required to mitigate the affordability gap for worker housing units at each household income affordability level. The affordable housing linkage fee that is considered as a result of the nexus analysis is designed to mitigate the development’s impact on the local housing market by providing a funding source for affordable worker housing. Linkage fees are an especially important source of funding now that federal and state funds for affordable housing have drastically dwindled in recent years.

The following are the key findings from the study:

1. Broward County Employment Growth

According to Florida Department of Economic Opportunity (DEO) projections Broward County’s total non-agricultural employment is projected to increase by 89,969 jobs during the next eight years (11,246 jobs annually). According to employment projections, the top occupations projected to gain the “most new jobs” include Food Preparation & Serving workers (3,906 jobs), Customer Service Representatives (3,017 jobs), Registered Nurses (2,699 jobs), Retail Salespersons (2,682 jobs) and Janitors & Cleaners workers (1,952 jobs). Significantly, the majority of projected job growth in the coming years will be in lower

wage, service sector occupations with annual incomes that fall within the “Low” and “Moderate” household income categories.

Broward County’s workforce is primarily employed in Office and Administrative Support and Retail Sales occupations. These two major occupation groups represent just over a third of the workforce in this range with Office and Administrative Support occupations accounting for nearly one quarter of all workforce employment. Most of Broward County’s leading occupations earn less than \$27,448 annually, which calculates as less than 50 percent of the median household income.

2. Housing Market

According to the MIAMI Association of Realtors’ December 2018 sales report, the median sales price of existing single-family homes in Broward County is \$350,000 and \$160,000 for townhouses and condos. Rental housing prices in Broward County have been commensurate with rapidly escalating home sale prices. Broward County’s rental market continues to have significant demand issues which have impacted vacancy rates, absorption levels and rent prices. As of November, 2018 the overall average rent in Broward County was \$1,843, which represents an 8.0 percent year-over-year increase. The average rent for a two bedroom apartment was \$1,902 (Reinhold P. Wolff, Economic Research, 4Q 2018 Report for Broward County).

3. Housing Affordability

Affordability calculations based on the price of an existing single-family home in Broward County found extreme gaps for all households earning less than 150 percent of the County’s median household income (\$54,895). Significant affordability gaps also exist for existing condominiums for households earning less than 80 percent of the median household income. An affordability gap analysis of market rate rental units indicates substantial gaps for “very low” (\$1,157), “low” (\$745), “moderate” (\$471), and “workforce” (\$196) income households.

4. New Household Demand by New Residential Development Activity

The study provides an estimate of new households by income category generated by the creation of eight (8) residential building types. The residential building types are based on the residential classifications included in the Broward County Property Appraisal’s 2018 Tax Roll.

Residential building types with the great affordable housing impact are large (>3,000 sf) single-family homes and condominiums. Most spending will be generated by households residing in these higher value residential units. The nexus calculation found the spending by 100 single-family households will generate the creation of 70 new jobs and 40 new

affordable housing units. The analysis found most new household demand would be in the “very low” and “low” household income categories. The development of 100 new condominiums would generate the creation of 50 new jobs and 29 new affordable housing units.

Housing Development Costs

Development pro forma prepared for a range of affordable owner and renter new construction scenarios found substantial affordability gaps at all levels of household income. Substantial affordability gaps exist for “moderate” to “middle” household income categories for homeownership construction scenarios and for “very low” and “low” income rental housing construction scenarios. Affordability gaps range from \$88,259 per unit at the “middle” household income price point to \$170,602 per unit at the “moderate” household income price point for homeownership. Rent affordability gaps per unit range from \$203,360 at the “low” renter household income affordability level to \$269,702 at the “very low” renter household income affordability level.

5. Total Nexus Costs

Total nexus costs are derived from a calculation of the total number of new worker households by income category estimated to be generated by each of the eight (8) residential building types, the affordability gap and square feet. Total nexus cost calculations per square foot found the highest costs per square foot in “low” and very low” household income categories. Total nexus cost per square foot are highest for condominiums (\$29-\$42 per sf). The nexus costs for other residential building types range between \$14-\$15 per sf with the exception of mobile homes which average between \$4-\$5 per sf.

CHAPTER 1: INTRODUCTION

Background

The following study is a continuation of the *2019 Broward County Housing Linkage Fee Nexus Study* prepared on behalf of Broward County, Florida by the Florida International University (FIU) Metropolitan Center. The *2019 Broward County Housing Linkage Fee Nexus Study* focused on whether there exists a reasonable linkage and nexus between the construction of new workplace (nonresidential) buildings of 100,000+ square feet in Broward County and the demand for affordable housing by the employees that will work within these buildings. This study focuses on determining whether there exists a reasonable linkage and nexus between the construction of new (residential) buildings in Broward County and the worker demand for affordable housing created by the residents that will reside in these new units.

The study provides household income available for expenditures after deducting taxes, savings and household debt will determine the relationship or linkage between the gross income of new households residing in the eight (8) residential property prototypes and the estimated disposable income by deducting housing costs, taxes, savings and other deductions. The step-by-step analysis is based on anticipated economic and residential growth in Broward County and the demand for affordable housing by individuals expected to benefit as a result of living in Broward County. IMPLAN Model calculations are used to calculate new jobs generated as a result of the new residential units.

The residential nexus analysis establishes maximum supportable impact fee levels applicable to each residential development prototype. The underlying concept of the residential nexus analysis is that newly constructed units represent net new households in Broward County. These households represent new income in the County that will consume goods and services, either through purchases of goods and services or “consumption” of governmental services. New consumption generates new local jobs, of which, a significant portion of the new jobs will be low wage. Low wage jobs relate to lower income households that cannot afford market rate units and, subsequently, will be in need of new affordable housing in Broward County.

Methodology

The analysis is based on the methodology utilized in other municipalities throughout the country. The analysis determines the relationship between the construction of new residential properties in Broward County and the demand for new affordable housing. The methodology uses prototypical residential building types as the basis for a series of calculations aimed to help quantify the affordability nexus and establish a basis by which to arrive at a fee amount. The basic steps of the residential nexus analysis are as follows:

- Determine residential building prototypes and detail characteristics
- Estimate the gross household income affordability threshold for each residential prototype

- Calculate the income available for expenditures after taxes, savings and other deductions based on gross household income per residential prototype
- Apply consumer spending by residents of new housing units in IMPLAN Model and estimate new jobs generated by spending pattern
- Estimate earnings for occupations created by new residential development and household incomes
- Calculate nexus costs per square foot based on affordability gap analysis

The analysis conducted by FIU Metropolitan Center quantifies the potential demand at various household affordability levels for each of the following eight (8) residential building prototypes:

- Large single-family homes that are at or above 3,000 sq. ft.
- Small single-family homes that are below 3,000 sq. ft.
- Townhomes
- Mobile home
- Condominiums
- Cooperatives
- Multi-family homes (apartments) with 10 or more units
- Multi-family homes (apartments) less than 10 units¹

For the purpose of this study, the FIU Metropolitan Center developed a sample of the eight residential building prototypes that apply to the residential building make-up of Broward County. The number and scope of prototypes had to be expanded compared to the typical prototypes used in previous studies from other municipalities. Previous studies used a five-prototype model based on square footage per unit. For this analysis, that model did not apply considering the similarities of square footage throughout the different prototypes as well as Broward County’s more expansive housing market that includes a large number of citizens living in mobile home condominiums, cooperatives, as well as the division of multi-family units by size and units per building. These prototypical units are based on the residential classifications included in the Broward County Property Appraisal’s 2018 Tax Roll.

Table 1.1 below provides the characteristics of each residential prototype used within the study. Vacant residential as a prototype is not characterized within the study. However, it is important to note there are 10,962 vacant residential units in Broward County. The residential building characteristics include the number of residential buildings constructed between the years 2014 to 2018 in Broward County. A total of 7,890 new units were constructed during this period.

The outcome of the nexus analysis is the calculation of the potential number of housing units by affordability level as a result of the economic impact created by residents in each new

¹ Building prototypes are types used by the Broward County Property Appraiser’s Office, http://www.bcpa.net/use_code.asp

residential building type. The nexus cost is the amount required to mitigate the affordability gap for worker housing units at each affordability level. The linkage fee that is considered as a result of the nexus analysis is designed to mitigate the development's impact on the local housing market by charging a fee to help provide housing opportunities for eligible households.

The first step in the residential nexus analysis was to extract all residential properties built from years 2014-2018 from the Broward County Property Appraisers office. After the extraction of this data the housing units were divided within their prototype categories based on how they were defined in the 2018 Property Tax Roll. The total number of buildings per prototype were extracted along with the median year built, average square foot per prototype, average units per building, average square footage per unit, and average building value. The average value per unit was then calculated by multiplying the average building value by the average units per building. The average value per square foot was calculated by dividing the average building value by the average square foot per prototype. The FIU Metropolitan Center then used this data to determine the gross household income per prototype for the IMPLAN Model calculations.

The next step in the process was to determine the gross household income necessary per residential prototype. The average value per unit, calculated in the first step, was considered the potential sales price and after the deduction of basic homeowner's costs and fees the annual household income required to afford each particular housing prototype was determined.

The next step of calculating the income available for expenditures after taxes, savings, and other necessary deductions, was based on the annual household income calculated in the previous step. These calculations determined what percentage of income is available for households after basic deductions. These deductions do not include food, healthcare, or other daily necessities. (See [Appendix B](#) for more detailed disposable income calculations)

The next step is the application IMPLAN Model which calculates new job creation based on the consumer spending of new households in the residential unit prototypes. IMPLAN distributes these jobs across industry sectors. The distributions of jobs by industry sector is converted into occupational distribution. Occupations within sectors are characterized by specific annual earnings, which are used to estimate household income for the workers in these occupations.

The final step is the calculation of the nexus fees based on the new households by income levels, development pro forma calculations and respective affordability gap analysis.

Table 1.1: County Residential Construction Characteristics, 2018

Type	Count	Year Built Range	Median Year Built	Average Sq. Ft. per Prototype	Average Units Per Building	Average Sq. Ft. per Unit	Average Building Value	Average Value per Unit	Average Value per Sq. Ft
Single Family Small (<3,000 SF)	1,421	2014 - 2018	2016	2155.45	1.00	2,161.53	\$313,651.10	\$314,536.52	\$145.52
Single Family Large (≥3,000 SF)	2,358	2014 - 2018	2016	4646.20	1.00	4,616.83	\$935,290.30	\$929,378.52	\$201.30
Townhouse	2,548	2014 - 2018	2016	1834.63	1.00	1,832.47	\$282,014.64	\$281,683.10	\$153.72
Mobile Homes	77	2014 - 2018	2016	1403.08	1.00	1,403.08	\$50,762.21	\$50,762.21	\$36.18
Condominiums	1,343	2014 - 2018	2016	1541.12	1.00	1,541.12	\$652,867.81	\$652,867.81	\$423.63
Cooperatives	27	2014 - 2018	2014	1307.22	1.00	1,307.22	\$119,787.69	\$119,787.69	\$91.64
Multi Family 10 Units+	80	2014 - 2018	2016	259,478.04	191.72	1,353.40	\$36,289,916.13	\$189,282.38	\$139.86
Multi Family Less than 10 Units	36	2014 - 2018	2017	3,332.78	2.42	1,379.08	\$406,461.67	\$168,191.03	\$121.96
Total	7,890								

CHAPTER 2: GROSS HOUSEHOLD INCOME ANALYSIS

Introduction

After establishing the prototype characteristics, the next step in the residential linkage fee nexus analysis is to determine the overall household income needed to purchase each prototypical unit. This calculation highlights annual mortgage payment costs, total annual housing costs and the annual household income required to afford each prototypical unit.

Consideration of Renters

For the purpose of this study, renters were included in their own category. The average prototype unit value was examined relative to gross household income and income available for expenditures after the deduction of taxes and other household costs. Renters whose income falls within the confines of the gross household income necessary to afford a specific prototype would be considered potential buyers. The added cost of owning property versus renting must be taken into consideration when evaluating the overall affordability of renters potentially becoming buyers. If the combined costs of mortgage payment, maintenance, taxes and insurance, among other additional fees, are greater than one third of their household's income, the cost of renting over purchasing would be considered more affordable. Qualitative factors such as a renter's long-term goals and motivation for renting over purchasing should also be considered when analyzing their propensity to switch from renting to purchasing.

Methodology

In this step, the gross household income of each prototypical unit is determined by calculating the amount of annual income needed to afford each housing unit. A mortgage calculator from [BankRate](#) was utilized to determine the average monthly mortgage payment and annual mortgage costs per prototype. This particular mortgage calculator allows for the customization of specific factors that are being examined throughout the study, such as specified down-payment amount, loan length, and interest rate.

Step 1: Determination of Annual Mortgage Costs

For this step, the average housing value of the particular prototype unit being examined was inputted into the calculator. The standard 20 percent down payment cost was used throughout the calculations of each prototype's annual mortgage costs. This is the down payment percentage threshold that would have to be paid in order for buyers not to be required by lenders to purchase private mortgage insurance. A loan length of 30 years was used in these calculations as the 30-year fixed rate mortgage is the most commonly used mortgage payoff term. For the required interest rate, an average state interest rate of 4.227 percent for a 30-year fixed rate mortgage, reported by [NerdWallet](#) (2019), was applied. After inputting these points of information into the mortgage calculator, the monthly principal and interest was calculated along with estimated homeowner's insurance costs, property tax and homeowner's association fees. The monthly estimated

principal and interest was the only data point extracted from the BankRate mortgage calculator for the purpose of this study. Average property tax rates and homeowners insurance costs collected from Broward County sources were calculated and inputted into the gross household income model in place of the estimates from BankRate. After the extraction of the monthly principal and interest cost from the mortgage calculator, the data was multiplied by 12 to calculate the annual mortgage payment costs to purchasers of that specific prototype.

Step 2: Determination of Annual Household Income

Property taxes and homeowner insurance costs were then added to the annual mortgage payment calculation. For the annual property tax costs, the estimated value of 1.98 percent was extracted from the Broward County Property Appraisers Office as an estimated value based upon the average County millage rate of 19.8238 mills. The percentage of 1.98 was then multiplied by the sales price of the prototype to equal the annual costs of property taxes. To determine the average homeowner insurance rate in Broward County, the average of all estimated insurance premiums from the leading insurance companies throughout the County was calculated. This information was extracted from the [Florida Office of Insurance Regulation](#). The homeowner insurance costs varies depending on the size and cost of the property. The average annual home insurance rate was \$4,450 for homes costing more than \$300,000 and \$2,758 for a property values at \$150,000. The property taxes and average homeowner insurance costs were then added to the annual mortgage payment costs to equal the total annual housing costs.

The total annual housing costs were then multiplied by a factor of three to calculate the annual household income required to afford the prototype sales price. Annual household income is multiplied by three because the percentage of income spent on housing annually should not exceed 33 percent of annual household income. The housing affordability standard of 30 percent, or one-third, of overall income was first established in the United States National Housing Act of 1937 and has since been used as a housing affordability guideline. The 30 percent guideline is viewed as the amount of income a family should spend on housing and still have enough income available for non-housing expenses such as food, medical care, transportation, and other necessities without being considered cost-burdened. The sales price to income ratio was then calculated by dividing the sales price by the annual household income required. (See [Appendix A](#) for the full display of calculations for each prototype)

Table 2.1: Gross Household Income

	Single Family- Large	Single Family- Small	Townhome	Mobile Home	Condominium	Cooperative	Multi-Family 10 Units +	Multi-Family 10 Units
Gross HH Income	\$199,8835	\$76,4575	\$69,898	\$18,453	\$144,362	\$32,309	\$46,229	\$42,025

CHAPTER 3: INCOME AVAILABLE FOR EXPENDITURES

Introduction

Income available for expenditures is the gross income after the deduction of taxes and savings. Income available after expenditures is the input that is used for the IMPLAN Model which estimates 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.

Methodology

The Federal Income Taxes reflect the average tax rates (as opposed to marginal) based on U.S. Internal Revenue Services with tax rates reflecting averages for the applicable income range. These tax rates can be retrieved from https://www.irs.gov/statistics/soi-tax-stats-individual-statistical-tables-by-size-of-adjusted-gross-income#_grp1.

The FICA Tax Rate is the Social Security and Medicare taxes that employees pay. The Social Security taxes are estimated based upon the current ceiling on applicability of Social Security taxes of \$118,500 (ceiling applies per earner not per household) and the average number of earners per household. The current rate for Social Security taxes is 6.2 percent and for Medicare is 1.45 percent for which the employee is responsible for. This information can be retrieved from <https://www.irs.gov/taxtopics/tc751>.

Savings and other deductions reflect the household savings including retirement accounts like 401k / IRA and other deductions such as interest costs on credit cards, auto loans, etc., which are necessary to determine the amount of income available for expenditures. The 6.7 percent rate used in the analysis for households earning less than \$225,000 is based on the 2018 National Income and Product Accounts “Personal Income and Its Disposition” in savings from the U.S. Bureau of Economic Analysis data which is retrieved from <https://www.bea.gov/system/files/2019-03/pi0219.pdf>.

The Percent of Income Available for Expenditures are deductions from gross income. These deductions are federal income taxes, FICA, savings, and other deductions to arrive at the income available for expenditures. This is consistent with the way the IMPLAN Model and the National Income and Product Accounts (NIPA) defines income available for personal consumption expenditures. Income taxes, contributions to Social Security and Medicare, and savings are deducted. However, property taxes and sales taxes are not deducted. Housing costs are not deducted as part of the adjustment because they are addressed separately as expenditures within the IMPLAN Model.

Sources: U.S. Internal Revenue Services, Tax Statistics, Tables 1.1: https://www.irs.gov/statistics/soi-tax-stats-individual-statistical-tables-by-size-of-adjusted-gross-income#_grp1 ; U.S. Internal Revenue Services, Social Security & Medicare Taxes: <https://www.irs.gov/taxtopics/tc751> ; Bureau of Economic Analysis: Table 2 Personal Income and Its Disposition: <https://www.bea.gov/system/files/2019-03/pi0219.pdf>

Table 3.1: Income Available for Expenditures

Type	Single Family Large (≥ 3,000 SF)	Single Family Small (< 3,000 SF)	Townhouse	Mobile Homes	Condominiums	Cooperatives	Multi Family <10 Units	Multi Family ≥10 Units+
Gross Income	\$199,883.08	\$76,457.47	\$69,897.98	\$15,387.28	\$147,950.51	\$32,309.39	\$42,024.55	\$46,229.37
Less:								
Federal Income Taxes	\$33,580.36	\$10,627.59	\$9,086.74	\$1,477.18	\$24,855.69	\$3,683.27	\$4,916.87	\$5,408.84
FICA Tax Rate	\$15,291.06	\$5,849.00	\$5,347.20	\$1,177.13	\$11,318.21	\$2,471.67	\$3,214.88	\$3,536.55
Saving & Other Deductions	\$13,392.17	\$5,122.65	\$4,683.16	\$1,030.95	\$9,912.68	\$2,164.73	\$2,815.64	\$3,097.37
Income Available for Expenditures	\$137,619.50	\$54,858.23	\$50,780.88	\$11,702.03	\$101,863.93	\$23,989.72	\$31,077.15	\$34,186.62
Percent of Income Available for Expenditures	69%	72%	73%	76%	69%	74%	74%	74%

CHAPTER 4: NEW JOB CREATION

Step 1: Disposable Income

An “Economic Impact Analysis” estimates the economic impact (in terms of jobs, labor income, taxes, etc.) of an initial change in the local economy. In relation to the Residential Linkage Fee Nexus Study, the analysis shows the impact of the addition of households in the respective income categories on the jobs/occupations in Broward County. Since it is assumed that these will be new households, the jobs they create are also assumed to be added to the economy.

The analysis relies on IMPLAN ((Impact Analysis for Planning), an economic model that measures the amount of total economic activity that results from an industry (or household) spending an additional dollar in the local economy. At the heart of the model is a national input-output dollar flow table called the Social Accounting Matrix (SAM), which measures the economic relationships between government, industry, and household sectors, and accounts for all the dollar flows between the different sectors within the economy. The induced impacts of the model capture the effects of household spending. Induced impacts result from the household spending of employees of business establishments that the new households patronize (direct) and their suppliers (indirect). The model also accounts for local commute patterns in the geography. For example, if 20 percent of retail workers who work in the region live outside of the region, the model will allocate 80 percent of labor’s disposable income into the model to generate induced impacts. The model excludes payments to federal and state taxes and savings based on the geography’s average local tax and savings rates. Thus, only the disposable incomes from local workers need to be included in the model.

To input accurate household spending induced by the new households in the different prototypes of dwellings, the previous analysis calculated the income levels related to the value of the properties. (Table 3.1) It also calculated the actual disposable income of the respective households which is the input entered in IMPLAN that will circulate in the local economy and generate impacts. For a spending pattern analysis, the full value is spent, hence, it needs to be pre-netted or stripped of savings and taxes. The percentage of disposable income ranges from 69 percent to 76 percent. Household income associated with each of the prototypes ranges from \$11,702 (mobile homes) to over \$137,000 (single family, large lot)

The calculations used the Household Income Change Activity type for input of the disposable income of new households. As exemplified by other studies, for representative purposes, the nexus analysis calculated impact associated with the spending of 100 households in each prototype. An additional adjustment is made for vacancy. In 2017, 16.8 percent of housing units in Broward County were vacant. However, in 2018, a strong housing demand has likely decreased that rate. It is also assumed that given the strong

housing market, vacancies in single-family homes are negligible. Therefore, the analysis only makes adjustments for multifamily properties, using average vacancy rates from CoStar, which reported a 4.7 percent vacancy rate for buildings with fewer than 10 units, and a 6.0 percent vacancy rate for buildings with 10+ units for the last Quarter of 2018.

A 5 percent conservative vacancy adjustment was also calculated for condominiums. In 2017, the vacancy rate in Broward was 1.4 percent for homeowners and 8.1 percent for renters. (U.S. Census, American Community Survey, 2017 1-year estimate)

Table 4.1: Income Available for Expenditures

Type	Gross Income	% Disposable Income	Disposable Income	Spending by 100 units	Spending by 100 units (Adjusted)
Single Family Large (≥3,000 SF)	\$199,883	69%	\$137,620	\$13,761,950	\$13,761,950
Single Family Small (<3,000 SF)	\$76,457	72%	\$54,858	\$5,485,823	\$5,485,823
Townhouse	\$69,898	73%	\$50,781	\$5,078,088	\$5,078,088
Mobile Homes	\$15,387	76%	\$11,702	\$1,170,203	\$1,170,203
Condominiums	\$147,951	69%	\$99,393	\$9,939,348	\$9,442,380
Cooperatives	\$32,309	74%	\$23,990	\$2,398,972	\$2,398,972
Multi Family <10 Units	\$42,025	74%	\$31,077	\$3,107,715	\$2,961,653
Multi Family ≥10 Units	\$46,229	74%	\$34,187	\$3,418,662	\$3,213,542

Source: U.S. Internal Revenue Services, Tax Statistics, Tables 1.1 and 2.1 for 2016; Social Security & Medicare Taxes; Bureau of Economic Analysis: Table 2.1 Personal Income and Its Disposition

Step 2: Job Impact

The new households residing in the prototypes will generate economic impact through household consumption spending. As a result of increased demand for goods and services, they will support new jobs. For the purpose of calculating job impact, the total disposable income is inputted into the model. The Household Income Change spending pattern includes purchases of commodities that households typically spend their wages on (electricity, mortgage, groceries, utilities, healthcare etc.).

IMPLAN estimates for new job growth by prototype range from approximately 9 jobs to 91 jobs, depending on the disposable income available for spending.² Most of the new jobs created will be filled by Broward residents. Approximately 77 percent of Broward County's workforce lives within the County. Therefore, the number of jobs for each building type is

² IMPLAN uses the term "disposable income" to mean all spending, whereas other sources may use it to denote 'discretionary spending', which is the spending that occurs after the basic needs (food, shelter, utilities, etc) are covered.

reduced by 23 percent to reflect the proportion of new employees expected to reside in Broward County.

Table 4.2: New Jobs Generated by Residential Prototypes

Type	Spending Per 100 Households/Units	New Jobs	New Jobs adjusted
Single Family Large ($\geq 3,000+$ SF)	\$13,761,950	90.5	69.7
Single Family Small ($< 3,000$ SF)	\$5,485,823	38.5	29.6
Townhouse	\$5,078,088	35.6	27.4
Mobile Homes	\$1,170,203	8.8	6.8
Condominiums	\$9,442,380	65.2	50.2
Cooperatives	\$2,398,972	18.2	14.0
Multi Family < 10 Units	\$2,961,653	23.1	17.8
Multi Family ≥ 10 Units	\$3,213,542	25.0	19.3

Source: Calculations and IMPLAN modeling by the FIU Metropolitan Center.

CHAPTER 5: HOUSEHOLD INCOME CATEGORIES AND GAPS

Many of the new jobs will be created in sectors with incomes that may contribute to an increase of cost-burdened households. In the subsequent analysis, the jobs estimated by IMPLAN are distributed across industry sectors and matched with the respective earnings for those sectors. The calculations then convert these job earners into households and estimate the households created by new construction for these residential prototypes by income category. The end result is a calculation of households for whom affordable housing development will be needed. Following are the steps in the calculations.

Step 1: IMPLAN-NAICS Crosswalk

IMPLAN distributes job impacts across 536 industry sectors which correspond to industry subsectors in the North American Industry Classification System (NAICS). To calculate occupations within sectors, the IMPLAN sectors are converted to 2-digit NAICS sectors. The distribution of jobs by NAICS sector are shown in [Appendix C](#).

Step 2: Occupations and Wages within Industry Sectors

The Florida Department of Economic Opportunity (DEO) reports occupation distribution by industry sector. Occupations are grouped into 22 occupational categories, including Management, Business and Financial Operations, Sales, Office, Production etc. The industry sector job distributions from Step 1 are converted into occupational distribution. The distributions of occupations for the top sectors by employment in Broward are shown in [Appendix D](#). For brevity, the table shows only the top ten sectors, but the analysis is based on all 17 industry sectors.

Next, income levels by occupation are determined for each of the occupation groups utilized in this analysis. The Florida DEO reports wages for each occupation and industry sector.³ The same occupational categories have different wages depending on the sector of the occupation. For example, the median wage for office and administrative support occupations ranges from \$25,152 in the accommodation and food services sector to \$41,125 in the public administration sector. Median wages for management occupations range from \$61,466 in accommodation and food services, to \$132,580 in the wholesale trade sector. Median wages by occupation for the top ten employment sectors are displayed in [Appendix E](#).

These income levels will be used for determination of housing need in subsequent steps.

Step 3: Determination of New Households by Residential Prototype

In this step, individual workers and spending are converted into households and household incomes.

³Florida Department of Economic Opportunity, Labor Market Statistics , <http://www.floridawages.com/eds.php> Data accessed in April 2019.

In 2017, approximately 75.3 percent of Broward County’s households had at least one worker in the household (American Community Survey (ACS) 5-year Estimates (2013-2017)). This corresponds to 508,926 worker households. In 2017, almost 77 percent of Broward County’s population in the 16-64 age group were employed, or 876,555 workers. These figures correspond to a ratio of 1.72 workers per worker household.

The calculation of the new households is performed by dividing the number of new workers by the ratio of workers per worker household. The number of new workers (235 total) was calculated in the previous steps of the analysis. The final calculation shows that new residential buildings will result in the creation of 136 new worker households.

Table 5.1: Estimate of New Households Implied by New Workers in Broward County

Workers/Households	Number
Worker Households	508,926
Workers/Worker Household	1.72 (ratio)
Workers in Households	876,555
New Workers	235
New Households Implied	136

Sources: US Census Bureau, American Community Survey, 2013-2017, Broward County; IMPLAN calculations and tabulation by the Metropolitan Center, FIU.

Since most spending will be generated by households residing in the higher value residential units, the most new households will be supported by single family over 3,000 square feet – 40, and condominiums - 29.

Table 5.2: New Households by Residential Prototype

Residential Type	Spending Per 100 Households/Units	New Jobs	New Households
Single Family Large (≥3,000+ SF)	\$13,761,950	70	40
Single Family Small (<3,000 SF)	\$5,485,823	30	17
Townhouse	\$5,078,088	27	16
Mobile Homes	\$1,170,203	7	4
Condominiums	\$10,186,393	50	29
Cooperatives	\$2,398,972	14	8
Multi Family < 10 Units	\$2,961,653	18	10
Multi Family ≥10 Units	\$3,213,542	19	11

Step 4: Determination of Housing Need by Affordability Level

In this step, data from the previous two calculations are combined to determine the level of need (demand) for workforce housing because of new residential development in Broward County. The determination of housing need is calculated by utilizing the ratio of workers per household and the occupational income categories in the previous steps of the analysis. The calculation produces the number of households by income category. The number of households by income category are then used to estimate the demand created from each residential prototype. The following table quantifies the number of households by affordability level associated with the residential types and is combined with actual housing unit costs in the following section to produce the total nexus costs per prototype.

Table 5.3: Households by Income Level Categories by Residential Building Prototype

Income Levels	Single Family (≥3,000 SF)	Single Family (<3,000 SF)	Townhouse	Mobile Homes	Condominiums	Cooperatives	Multi Family <10 Units	Multi Family ≥10 Units
Very Low (Under \$27,448)	16	7	6	2	12	3	3	4
Low (\$27,449 - \$43,916)	13	6	5	1	9	3	3	4
Moderate (\$43,917 - \$54,895)	3	1	1	0	2	0	0	1
Workforce (\$54,896 - \$65,874)	5	2	2	1	4	1	1	2
Middle (\$65,875 - \$82,343)	2	1	1	0	1	0	0	1
Total Households	39	17	15	4	28	8	8	11

Notes: Total household figure taken into consideration alongside the 23% commute adjustment for Broward County; 2017 median household income for Broward County is \$54,895. Source: FIU Metropolitan Center

Housing Affordability

Housing affordability is defined as housing costs that do not exceed 30 percent of monthly gross income. When current residential prices are applied to the five (5) household income categories used for this study, it is evident that affordability gaps exist for all household income categories for single-family homes and for households earning less than 80 percent of the median income for condominiums. The affordability gaps for single-family homes are extreme for households earning less than 150 percent of Broward County’s median household income (\$54,895). Significantly, the purchase of the median priced single-family home is virtually unattainable for these household income groups. Likewise, the purchase of the median priced condominium is unattainable for households earning less than 80 percent AMI.

Table 5.4: Owner Affordability Levels for Household Income Categories

Income Range % of Median HH Income	Annual Household Income	Monthly Household Income	Affordable Single Family/Condo Home Price	Median Selling SF Price	SF Affordability Gap/Surplus	Median Selling Condo Price	Condo Affordability Gap/Surplus
Very Low Income: <50%	\$27,448	\$2,287	\$82,343	\$350,000	\$267,658	\$160,000	\$77,658
Low Income: <80%	\$43,916	\$3,660	\$131,748		\$218,252		\$28,252
Moderate Income: <100%	\$54,895	\$4,575	\$164,685		\$185,315		\$4,685
Workforce Income: <120%	\$65,874	\$5,490	\$197,622		\$152,378		\$37,622
Middle Income: <150%	\$82,343	\$6,862	\$247,028		\$102,973		\$87,028

Source: MIAMI Association of Realtors, US Census, 2017 ACS. Table and calculations by the FIU Metropolitan Center.

An affordability gap analysis of market rate rental units indicates substantial gaps for “very low” (\$1,157), “low” (\$745), “moderate” (\$471), and “workforce” (\$196) income households (Table 3.8).

Table 5.5: Renter Affordability Levels for Household Income Categories

Income Categories % of Median HH Income	Household Income	Affordable Rent	Mean Rental Price	Affordability Gap/Surplus
Very Low Income: <50%	\$27,448	\$686	\$1,843	\$1,157
Low Income: <80%	\$43,916	\$1,098		\$745
Moderate Income: <100%	\$54,895	\$1,372		\$471
Workforce Income: <120%	\$65,874	\$1,647		\$196
Middle Income: <150%	\$82,343	\$2,059		\$216

Source: U.S. Census, 2017 ACS; 3Q 2018 Reinhold P. Wolff Economic Research, Inc. Table and calculations by the FIU Metropolitan Center.

CHAPTER 6: NEXUS COSTS

This step of the nexus analysis combines the numbers of new worker households for each household income category associated with the residential building prototypes with the affordability gap analysis provided in this chapter. Tables 5.5 and 5.6 above show the affordability gaps at different income levels. The comparison of affordable home and rent values to actual development scenarios produces the estimated nexus costs for each residential prototype.

The development scenarios are the product of development pro forma computations based on estimated prevailing land and construction costs for residential development types in Broward County. Estimated land and project costs (direct and indirect) were calculated against projected income generated from sales or rental income based on the affordability levels of each household income group to determine the surplus/gap for each development type by unit cost.

Development Model Selection Rationale

Four development models were selected as typical and representative of the housing product most likely to be built in Broward County over the next ten years given household sizes, land availability, construction costs, and consumer preferences. The prototype development products are:

- 1) A 3-story, 20-unit multifamily housing project, built as a single building, with surface parking at 2 spaces per unit (Table 3.9);
- 2) A 10-story, 100-unit multi-family building, also constructed as a single building, with surface parking at 2 spaces per unit (Table 3.10).
- 3) A 10-story, 100-unit multi-family building, with an adjacent 200 space, free-standing parking garage. The land acreage for this prototype was optimized due to its smaller footprint than prototype 2.
- 4) A 10-story, 100-unit multi-family building, with an adjacent 100 space, free-standing parking garage. The land acreage for this prototype was optimized due to its smaller footprint than prototypes 2 and 3.

The assumptions used for the development pro-forma are as follows.

Prototype Unit Size

The prototypical unit size selected for the study is a 1,000 square-foot, 2-bedroom condo/apartment unit. There are any number of possible housing units that are developed in the Broward market. Modeling the cost to produce all possible units is impractical. The goal of the nexus analysis is to develop an estimate of unit housing cost that best represents the possible average housing cost required to house new workers created by new commercial development. The prototype unit size represents the best estimate of an average housing unit cost, and was selected based on the following considerations:

- Family Size: 71 percent of all households in Broward County are 2 or more persons in size. Three or more person households represent 39 percent of all households in Broward County. In addition, the average size of all households in the County is 2.77 persons, and the average family household size in Broward County is 3.47 persons. From 2013 to 2017 the number of one person households shrank by 4,364 units;
- The odds that the household containing a new worker is two or three persons or more is therefore high;
- The U.S. Department of Housing and Urban Development (HUD) occupancy guidelines direct that housing units should have one bedroom for every two people in a household, so that a three-person household requires a minimum of two bedrooms;
- According to the U.S. Census Bureau Housing Survey, the median size of all occupied housing units in the urban centers of the Miami Metropolitan Area is 1,150 square feet. Housing units from 750 to 1,499 square feet in size are 44 percent of the Broward housing market;
- New two-bedroom units represent the largest share of new housing units produced in the County from 2013 to 2017 — accounting for 30 percent of the gain in total units for the period. The gain of two, three, and four-bedroom units accounted for 81 percent of the gain in units from 2013. During the same timeframe, Broward County lost 2,986 one-bedroom units, or 81 percent of the loss of housing units; and
- Multi-family housing units comprise 59 percent of the entire Broward County occupied housing inventory.

Land Costs

Average per acre land purchase prices were developed using a survey of recent raw land transactions in Broward County. While land costs can vary widely, the average cost of \$585,931 per acre is a best estimate current price snapshot of a range of real estate transactions.

Construction Costs

Construction costs were estimated using the latest (2019, Q1) RS Means Square foot cost survey data for the Fort Lauderdale / Broward County area. The estimate includes a 25% contractor overhead and profit, as well as typical fixtures, fittings and furnishings for new units of these types. Cost estimates were also reviewed by a small sample of local developers and builders in the field.

Soft Costs

Soft cost estimates, including the Developer Fee and Financing Costs are typical for development projects of these types, based on the research team’s experience, a review of similar recent projects, and professional review. In addition, Licenses and Permits, Impact Fees, and Property Taxes have been estimated using Broward County’s most recent schedule of permit fees (for Unincorporated Broward County), School and Transportation Concurrency fees, and property tax millage rates.

Unit Density and Parking Requirements

The County zoning code allows a maximum development density of 30 Dwelling Units per Acre (DUA) housing units per acre. A small set of municipalities allow higher unit density, but only in select locations. The 30 DUA is most representative of the maximum allowable density across the County, and was selected as the unit density for the development pro-forma.

Similarly, the County code requires 2 parking spaces per dwelling unit for all multi-family housing developments in unincorporated Broward, and therefore represents the most likely parking requirement to be applied to new multi-family housing development. However, the additional prototype models tested the use of structured parking, rather than surface parking, using 2 spaces per unit, and 1 space per unit. Prototypes 3 and 4, using adjacent structured parking, require significantly less land area to develop.

Unit Rents (for Apartment Unit Estimates)

Apartment rents are based on the previous affordability calculations (Table 3.8: Renter Affordability Levels for Household Income Categories).

Rental Unit Operating Costs

Operating costs for the apartment rental units were estimated using the *2018 National Apartment Association Survey of Income & Expenses in Rental Communities* — a survey representing data from 2,967 market-rent properties containing 807,810 units and 511 subsidized properties containing 83,697 units, broken out by region, and review by a small sample of experienced local affordable apartment owner/operators. The Maximum supportable mortgage cost assumes that the maximum affordable debt service on apartment operating costs at uses a Debt Service Coverage Ratio of 1.2, as recommended by HUD and underwriting guidelines, and assumes a 4.25% interest rate, 30-year fixed repayment term.

Model Results

The results of the Pro-Forma analysis and gap analysis for both purchase and rental options by prospective worker households are shown next.

Table 6.1: Development Scenario 1, 3-Story Multi-Family Building

Development Scenario: 3-Story Multi-Family Building	
Development Assumptions	
Land Area (Acres)	0.7
Total Units (All 2-Bedroom):	20
Density (Units per Acre)	30
Unit Size (SF)	1,000
Parking Spaces Per Unit	2.0
Land Purchase:	\$390,621
Per Unit Cost	\$19,531
Hard Costs:	\$3,764,867
Per Unit Cost:	\$188,243
PSF Cost:	\$164
Total Soft Costs:	\$975,981
Architecture & Eng.	\$301,189
Survey	\$25,000
Licenses & Permits	\$86,592
Impact Fees (School & Concurrency)	\$25,248
Legal, Accounting	\$50,000
Builder's Risk Insurance	\$30,119
Marketing & Advertising	\$60,000
Property Taxes	\$7,393
Sales Commission	\$164,685
Project Contingency	\$225,755
Development Fee	\$359,203
Financing Costs	\$340,422
Construction Interest	\$230,608
Financing Fees & Closing Costs	\$109,813
Total Development Cost	\$5,831,093
Per Unit	\$291,555

Gap Analysis - Purchase Model	
Total Development Cost	\$5,831,093
Per Unit	\$291,555
Affordable Moderate Income Purchase Price:	\$164,685
Gap/Surplus per Unit:	(\$126,870)
Affordable Workforce Income Purchase Price:	\$197,622
Gap/Surplus per Unit:	(\$93,933)
Affordable Middle Income Purchase Price:	\$247,028
Gap/Surplus per Unit:	(\$44,527)

Gap Analysis - Rent Model	
Total Development Cost	\$5,831,093
Per Unit	\$291,555
Affordable Very Low Income Monthly Rent:	\$686
Affordable Per Unit Debt Service/ Mortgage at Rent Level	\$90,052
Gap/Surplus per Unit:	(\$201,503)
Affordable Low Income Monthly Rent:	\$1,098
Affordable Per Unit Debt Service/ Mortgage at Rent Level	\$131,927
Gap/Surplus per Unit:	(\$159,628)

Table 6.2: Development Scenario 2, 10-Story Multi-Family Building

Development Scenario: 10-Story Multi-Family Building	
Development Assumptions	
Land Area (Acres)	3.3
Total Units (All 2-Bedroom):	100
Density (Units per Acre)	30
Unit Size (SF)	1,000
Parking Spaces Per Unit	2.0
Land Purchase:	\$1,953,103
Per Unit Cost	\$19,531
Hard Costs:	\$22,756,421
Per Unit Cost:	\$227,564
PSF Cost:	\$198
Total Soft Costs:	\$4,759,085
Architecture & Eng.	\$1,365,385
Survey	\$50,000
Licenses & Permits	\$523,398
Impact Fees (School & Concurrency)	\$117,600
Legal, Accounting	\$50,000
Builder's Risk Insurance	\$182,051
Marketing & Advertising	\$300,000
Property Taxes	\$36,964
Sales Commission	\$823,425
Project Contingency	\$1,310,262
Development Fee	\$2,062,803
Financing Costs	\$1,954,948
Construction Interest	\$1,324,319
Financing Fees & Closing Costs	\$630,628
Total Development Cost	\$33,486,360
Per Unit	\$334,864

Gap Analysis - Purchase Model	
Total Development Cost	\$33,486,360
Per Unit	\$334,864
Affordable Moderate Income Purchase Price:	\$164,685
Gap/Surplus per Unit:	(\$170,179)
Affordable Workforce Income Purchase Price:	\$197,622
Gap/Surplus per Unit:	(\$137,242)
Affordable Middle Income Purchase Price:	\$247,028
Gap/Surplus per Unit:	(\$87,836)

Gap Analysis - Rent Model	
Total Development Cost	\$33,486,360
Per Unit	\$334,864
Affordable Very Low Income Monthly Rent:	\$686
Affordable Per Unit Debt Service/ Mortgage at Rent Level	\$90,052
Gap/Surplus per Unit:	(\$244,812)
Affordable Low Income Monthly Rent:	\$1,098
Affordable Per Unit Debt Service/ Mortgage at Rent Level	\$131,927
Gap/Surplus per Unit:	(\$202,937)

Table 6.3: Development Scenario 3, 10-Story Multi-Family Building With Free-Standing Adjacent Parking Garage, 2 Spaces Per Unit

Development Scenario: 10-Story Multi-Family Building With Free-Standing Adjacent Parking Garage, 2 Spaces Per Unit		Gap Analysis - Purchase Model	
Development Assumptions		Total Development Cost	\$35,975,377
Land Area (Acres)	0.8	Per Unit	\$359,754
Total Units (All 2-Bedroom):	100	Affordable Moderate Income Purchase Price:	\$164,685
Density (Units per Acre)	118	Gap/Surplus per Unit:	(\$195,069)
Unit Size (SF)	1,000	Affordable Workforce Income Purchase Price:	\$197,622
Parking Spaces Per Unit	2.0	Gap/Surplus per Unit:	(\$162,132)
Land Purchase:	\$497,692	Affordable Middle Income Purchase Price:	\$247,028
Per Unit Cost	\$4,977	Gap/Surplus per Unit:	(\$112,726)
Hard Costs:	\$25,964,238	Gap Analysis - Rent Model	
Per Unit Cost:	\$259,642	Total Development Cost	\$35,975,377
PSF Cost:	\$226	Per Unit	\$359,754
Total Soft Costs:	\$5,197,061	Affordable Very Low Income Monthly Rent:	\$686
Architecture & Eng.	\$1,557,854	Affordable Per Unit Debt Service/ Mortgage at Rent Level	\$90,052
Survey	\$50,000	Gap/Surplus per Unit:	(\$269,702)
Licenses & Permits	\$597,177	Affordable Low Income Monthly Rent:	\$1,098
Impact Fees (School & Concurrency)	\$117,600	Affordable Per Unit Debt Service/ Mortgage at Rent Level	\$131,927
Legal, Accounting	\$50,000	Gap/Surplus per Unit:	(\$227,827)
Builder's Risk Insurance	\$207,714		
Marketing & Advertising	\$300,000		
Property Taxes	\$9,419		
Sales Commission	\$823,425		
Project Contingency	\$1,483,871		
Development Fee	\$2,216,129		
Financing Costs	\$2,100,257		
Construction Interest	\$1,422,755		
Financing Fees & Closing Costs	\$677,502		
Total Development Cost	\$35,975,377		
Per Unit	\$359,754		

Table 6.4: Development Scenario 4, 10-Story Multi-Family Building With Free-Standing Adjacent Parking Garage, 1 Space Per Unit

Development Scenario: 10-Story Multi-Family Building With Free-Standing Adjacent Parking Garage, 1 Space Per Unit	
Development Assumptions	
Land Area (Acres)	0.8
Total Units (All 2-Bedroom):	100
Density (Units per Acre)	118
Unit Size (SF)	1,000
Parking Spaces Per Unit	2.0
Land Purchase:	\$497,692
Per Unit Cost	\$4,977
Hard Costs:	\$24,084,674
Per Unit Cost:	\$240,847
PSF Cost:	\$209
Total Soft Costs:	\$4,923,491
Architecture & Eng.	\$1,445,080
Survey	\$50,000
Licenses & Permits	\$553,948
Impact Fees (School & Concurrency)	\$117,600
Legal, Accounting	\$50,000
Builder's Risk Insurance	\$192,677
Marketing & Advertising	\$300,000
Property Taxes	\$9,419
Sales Commission	\$823,425
Project Contingency	\$1,381,341
Development Fee	\$2,065,410
Financing Costs	\$1,957,419
Construction Interest	\$1,325,993
Financing Fees & Closing Costs	\$631,425
Total Development Cost	\$33,528,685
Per Unit	\$335,287

Gap Analysis - Purchase Model	
Total Development Cost	\$33,528,685
Per Unit	\$335,287
Affordable Moderate Income Purchase Price:	\$164,685
Gap/Surplus per Unit:	(\$170,602)
Affordable Workforce Income Purchase Price:	\$197,622
Gap/Surplus per Unit:	(\$137,665)
Affordable Middle Income Purchase Price:	\$247,028
Gap/Surplus per Unit:	(\$88,259)

Gap Analysis - Rent Model	
Total Development Cost	\$33,528,685
Per Unit	\$335,287
Affordable Very Low Income Monthly Rent:	\$686
Affordable Per Unit Debt Service/Mortgage at Rent Level	\$90,052
Gap/Surplus per Unit:	(\$245,235)
Affordable Low Income Monthly Rent:	\$1,098
Affordable Per Unit Debt Service/Mortgage at Rent Level	\$131,927
Gap/Surplus per Unit:	(\$203,360)

The above affordability gap calculations based on actual development scenarios are then applied to the total number of new worker households by income category that is estimated to be generated by each of the residential building prototypes to determine the nexus cost per square foot for each residential development. The calculation is based on the total number of new household units (new housing demand) times the affordability gap, divided by the average square foot size of each residential unit type in Broward County. Since calculations of new households were based on 100 units, the calculation of nexus costs per square foot make the necessary adjustment by dividing the total costs by 100.

Table 6.5: Nexus Costs per Square Foot (Scenario 1: 3-Story Multi-Family Building)

Income Category	Affordability Gap	Single Family Large (≥3,000 SF)	Single Family Small (<3,000 SF)	Townhouse	Mobile Homes	Condominiums	Cooperatives	Multi Family <10 Units	Multi Family ≥10 Units
Very Low	\$201,503	\$7.07	\$6.47	\$7.06	\$2.20	\$15.30	\$4.60	\$4.44	\$6.31
Low	\$159,628	\$4.44	\$4.10	\$4.47	\$1.49	\$9.61	\$3.38	\$3.27	\$4.32
Moderate	\$126,870	\$0.71	\$0.61	\$0.67	\$0.21	\$1.54	\$0.44	\$0.43	\$0.60
Workforce	\$93,933	\$1.11	\$0.98	\$1.07	\$0.36	\$2.39	\$0.91	\$0.88	\$1.06
Middle	\$44,527	\$0.18	\$0.16	\$0.17	\$0.05	\$0.39	\$0.12	\$0.11	\$0.16
Total Costs:		\$14	\$12	\$13	\$4	\$29	\$9	\$9	\$12

Source: FIU Metropolitan Center, 2019

Table 6.6: Nexus Costs per Square Foot (Scenario 2: 10-Story Multi-Family Building)

Income Category	Affordability Gap	Single Family Large (≥3,000 SF)	Single Family Small (<3,0 SF)	Townhouse	Mobile Homes	Condominiums	Cooperatives	Multi Family <10 Units	Multi Family ≥10 Units
Very Low	\$244,812	\$8.59	\$7.86	\$8.58	\$2.67	\$18.59	\$5.58	\$5.39	\$7.67
Low	\$202,937	\$5.65	\$5.21	\$5.69	\$1.89	\$12.22	\$4.30	\$4.15	\$5.49
Moderate	\$170,179	\$0.95	\$0.82	\$0.90	\$0.28	\$2.06	\$0.59	\$0.57	\$0.80
Workforce	\$137,242	\$1.62	\$1.43	\$1.56	\$0.52	\$3.49	\$1.33	\$1.28	\$1.55
Middle	\$87,836	\$0.35	\$0.31	\$0.34	\$0.10	\$0.76	\$0.23	\$0.22	\$0.32
Total Costs:		\$17	\$16	\$17	\$5	\$37	\$12	\$12	\$16

Source: FIU Metropolitan Center, 2019

Table 6.7: Nexus Costs per Square Foot (Scenario 3: 10-Story Multi-Family Building With Free-Standing Adjacent Parking Garage, 2 Spaces Per Unit)

Income Category	Affordability Gap	Single Family Large (≥3,000 SF)	Single Family Small (<3,000 SF)	Townhouse	Mobile Homes	Condominiums	Cooperatives	Multi Family <10 Units	Multi Family ≥10 Units
Very Low	\$269,702	\$9.47	\$8.66	\$9.45	\$2.94	\$20.48	\$6.15	\$5.94	\$8.45
Low	\$227,827	\$6.34	\$5.85	\$6.38	\$2.12	\$13.72	\$4.83	\$4.66	\$6.16
Moderate	\$195,069	\$1.09	\$0.94	\$1.03	\$0.32	\$2.37	\$0.68	\$0.65	\$0.92
Workforce	\$162,132	\$1.91	\$1.69	\$1.84	\$0.62	\$4.13	\$1.57	\$1.52	\$1.83
Middle	\$112,726	\$0.45	\$0.40	\$0.44	\$0.13	\$0.98	\$0.29	\$0.28	\$0.41
Total Costs:		\$19	\$18	\$19	\$6	\$42	\$14	\$13	\$18

Source: FIU Metropolitan Center, 2019

Table 6.8: Nexus Costs per Square Foot (Scenario 4: 10-Story Multi-Family Building With Free-Standing Adjacent Parking Garage, 1 Space Per Unit)

Income Category	Affordability Gap	Single Family Large (≥3,000 SF)	Single Family Small (<3,000 SF)	Townhouse	Mobile Homes	Condominiums	Cooperatives	Multi Family <10 Units	Multi Family ≥10 Units
Very Low	\$245,235	\$8.61	\$7.87	\$8.59	\$2.68	\$18.62	\$5.59	\$5.40	\$7.68
Low	\$203,360	\$5.66	\$5.22	\$5.70	\$1.90	\$12.24	\$4.31	\$4.16	\$5.50
Moderate	\$170,602	\$0.96	\$0.83	\$0.90	\$0.28	\$2.07	\$0.59	\$0.57	\$0.80
Workforce	\$137,665	\$1.62	\$1.43	\$1.57	\$0.53	\$3.50	\$1.33	\$1.29	\$1.55
Middle	\$88,259	\$0.36	\$0.31	\$0.34	\$0.10	\$0.77	\$0.23	\$0.22	\$0.32
Total Costs:		\$17	\$16	\$17	\$5	\$37	\$12	\$12	\$16

Source: FIU Metropolitan Center, 2019

An additional calculation is made for the nexus costs of small single family homes under 3,000 square feet. That calculation uses the average building just value, as reported in the Broward County Property tax roll of \$314,537 for single families of that size built within the last five years. Affordability gaps are calculated for each income category.

Table 6.9: Nexus Costs per Square Foot (Scenario 5: Single Family, Under 3,000 square feet)

Income Category	Affordability Gap	Single Family Large (≥3,000 SF)	Single Family Small (<3,000 SF)	Townhouse	Mobile Homes	Condominiums	Cooperatives	Multi Family <10 Units	Multi Family ≥10 Units
Very Low	\$245,235	\$7.88	\$7.21	\$7.87	\$2.45	\$17.05	\$5.12	\$4.94	\$7.03
Low	\$203,360	\$5.08	\$4.69	\$5.12	\$1.70	\$10.99	\$3.87	\$3.74	\$4.94
Moderate	\$170,602	\$0.84	\$0.73	\$0.79	\$0.25	\$1.82	\$0.52	\$0.50	\$0.71
Workforce	\$137,665	\$1.38	\$1.22	\$1.33	\$0.45	\$2.98	\$1.13	\$1.09	\$1.32
Middle	\$88,259	\$0.27	\$0.24	\$0.26	\$0.08	\$0.59	\$0.18	\$0.17	\$0.25
Total Costs:		\$15	\$14	\$15	\$5	\$33	\$11	\$10	\$14

Source: FIU Metropolitan Center, 2019

APPENDIX A: GROSS HOUSEHOLD INCOME CALCULATIONS

Table A1: Vacant Residencies

		Vacant Residence
Sales Price		\$1,423.65
Mortgage Payment		
Downpayment @20%		\$284.73
Loan Amount		\$1,138.92
Interest Rate		4.227%
Term of Mortgage		30 years
Annual mortgage payment	\$ 6.00	\$72.00
Other Costs		
Property Taxes	1.98% of sales price	\$28.19
Homeowner Insurance		\$2,758
Total annual Housing Costs		\$2,858.19
% of income spent on housing		33%
Annual Household Income Required		\$8,574.56
Sales Price to Income ratio		0.2

Table A2: Single Family-Large Lot (Above 3,000 Sq. Ft)

		Single Family Large
Sales Price		\$929,378.52
Mortgage Payment		
Downpayment @20%		\$185,875.70
Loan Amount		\$743,502.82
Interest Rate		4.227%
Term of Mortgage		30 years
Annual mortgage payment	\$3,648.00	\$43,776.00
Other Costs		
Property Taxes	1.98% of sales price	\$18,401.69
Homeowner Insurance		\$4,450
Total annual Housing Costs		\$66,627.69
% of income spent on housing		33%
Annual Household Income Required		\$199,883.08
Sales Price to Income ratio		4.6

Table A3: Single Family-Small Lot (Below 3,000 Sq. Ft)

		Single Family Small
Sales Price		\$314,536.52
Mortgage Payment		
Downpayment @20%		\$62,907.30
Loan Amount		\$251,629.22
Interest Rate		4.227%
Term of Mortgage		30 years
Annual mortgage payment	\$1,234.00	\$14,808.00
Other Costs		
Property Taxes	1.98% of sales price	\$6,227.82
Homeowner Insurance		\$4,450
Total annual Housing Costs		\$25,485.82
% of income spent on housing		33%
Annual Household Income Required		\$76,457.47
Sales Price to Income ratio		4.1

Table A4 Townhomes

		Townhomes
Sales Price		\$281,683.10
Mortgage Payment		
Downpayment @20%		\$56,336.62
Loan Amount		\$225,346.48
Interest Rate		4.227%
Term of Mortgage		30 years
Annual mortgage payment	\$1,106.00	\$13,272.00
Other Costs		
Property Taxes	1.98% of sales price	\$5,577.33
Homeowner Insurance		\$4,450
Total annual Housing Costs		\$23,299.33
% of income spent on housing		33%
Annual Household Income Required		\$69,897.98
Sales Price to Income ratio		4.0

Table A5 Mobile Homes

		Mobile Home
Sales Price		\$50,762.21
Mortgage Payment		
Downpayment @20%		\$10,152.44
Loan Amount		\$40,609.77
Interest Rate		4.227%
Term of Mortgage		30 years
Annual mortgage payment	\$199.00	\$2,388.00
Other Costs		
Property Taxes	1.98% of sales price	\$1,005.09
Homeowner Insurance		\$2,758
Total annual Housing Costs		\$6,151.09
% of income spent on housing		33%
Annual Household Income Required		\$18,453.28
Sales Price to Income ratio		2.8

Table A6: Condominiums

		Condominiums
Sales Price		
Mortgage Payment		
Downpayment @20%		
Loan Amount		
Interest Rate		4.227%
Term of Mortgage		30 years
Annual mortgage payment		
Other Costs		
Property Taxes	1.98% of sales price	
Homeowner Insurance		\$4,450
Total annual Housing Costs		\$48,120.78
% of income spent on housing		33%
Annual Household Income Required		\$144,362.35
Sales Price to Income ratio		4.5

Table A7: Co-operatives

		Cooperatives
Sales Price		\$119,787.69
Mortgage Payment		
Downpayment @20%		\$23,957.54
Loan Amount		\$95,830.15
Interest Rate		4.227%
Term of Mortgage		30 years
Annual mortgage payment	\$470.00	\$5,640.00
Other Costs		
Property Taxes	1.98% of sales price	\$2,371.80
Homeowner Insurance		\$2,758
Total annual Housing Costs		\$10,769.80
% of income spent on housing		33%
Annual Household Income Required		\$32,309.39
Sales Price to Income ratio		3.7

Table A8: Multi-Family (10 Units or more)

		Multi-Family (10+)
Sales Price		\$
Mortgage Payment		
Downpayment @20%		\$
Loan Amount		\$
Interest Rate		4.227%
Term of Mortgage		30 years
Annual mortgage payment	\$742.00	\$
Other Costs		
Property Taxes	1.98% of sales price	\$
Homeowner Insurance		\$2,758
Total annual Housing Costs		\$15,409.79
% of income spent on housing		33%
Annual Household Income Required		\$46,229.37
Sales Price to Income ratio		4.1

Table A9: Multi-Family (Less than 10 units)

		Multi-Family 10+ units
Sales Price		\$168,191.03
Mortgage Payment		
Downpayment @20%		\$ 33,638.21
Loan Amount		\$ 134,552.82
Interest Rate		4.227%
Term of Mortgage		30 years
Annual mortgage payment	\$ 660.00	\$ 7,920.00
Other Costs		
Property Taxes	1.98% of sales price	\$ 3,330.18
Homeowner Insurance		\$2,758
Total annual Housing Costs		\$14,008.18
% of income spent on housing		33%
Annual Household Income		\$42,024.55
Sales Price to Income ratio		4.0

APPENDIX B: DISPOSABLE INCOME AFTER DEDUCTION OF NON-HOUSING EXPENSES

Introduction

Disposable income after the deduction of non-housing expenses such as food, health care, transportation, credit card debt, and other necessities are not taken into consideration through the income after expenditures calculations done in chapter three or in the IMPLAN calculations. The non-housing expenses detailed in table 2.1 are the expenditures of a two person household, without children, after the housing costs deducted in chapter three's income available for expenditures table.

Methodology

Median household monthly income estimates reflect the median amount of money each household makes monthly before deducting housing costs, non-housing expenses, transportation costs, and monthly credit card payments. This data was extracted from the U.S. Census American Factfinder database under table S2503, Financial Characteristics 2013-2017. Overall annual income estimates for renters and owners were first extracted and then divided by 12 to calculate the monthly household income.

Median monthly housing costs estimates were extracted from U.S. Census 2013-2017 data. The median monthly housing costs to renters was taken from table B25031 and the median monthly housing costs to owners was taken from table S2506. The housing to income ratio was then calculated by dividing the median household monthly income by the median monthly housing cost for both renters and owners.

Non-housing expenses (food, healthcare, and other necessities) estimates were found at the Economic Policy Institute Family Budget Calculator (2017). The non-housing expenses of a two-person household were examined. The cost of food for a two-person household in Broward county came to an average of \$535, these costs were based on the USDA's low-cost food plan which assumes that almost all food is bought at a grocery store and then prepared at home. This food plan represents the amount families need to spend to have an adequately nutritious diet. Healthcare costs were estimated at \$673 and assumed that individuals bought the lowest cost plan on the health insurance exchange from the Affordable Care Act. These costs included insurance premiums and out-of-pockets costs that were calculated from the Health and Human Services Medical Expenditure Panel Survey. Other necessities cost came out to \$654 and included apparel, personal care, household supplies, reading material and school supplies, these costs came from the Bureau of Labor Statistics Consumer Expenditure Survey.

Monthly transportation costs were retrieved from the Center for Neighborhood Technology's Housing and Transportation Affordability Index (2017). The annual cost of transportation in Broward County from the H&T Index was \$11,895 which was then divided by 12 in order to calculate the average monthly cost of transportation in the county.

Credit card monthly debt payment data was extracted from [SmartAsset](#) (2018). The overall average credit card debt per capita in Broward County was \$3,969 and was extracted from a study done by SmartAsset titled, Counties with the Lowest Credit Card Debt per Capita. The average credit card debt per capita was then input into a Credit Card Calculator to determine the amount of the monthly payments. An interest rate of 13.02% was used with a payoff period of two years. The average monthly payments were calculated to be \$309.

Total expenses were calculated by adding the non-housing expenditures, transportation costs, and credit card debt payments for both owners and renters. Disposable income was then determined by subtracting the housing costs and total expenses from the monthly household income of both owners and renters.

Table 1B: Disposable Income after Non-housing Expenses Deduction

Type	2013-2017	2013-2017	Ratio	2017	2017	2018	Total Expenses	Disposable Income
Market-rate Rents	Census Data	Census Data	Housing/Income	Economic Policy Institute	H+T Transportation	SmartAsset		Income-housing-expenses
Cities	Median Household Monthly Income	Median Monthly Housing Cost	Ratio	non-housing expenses (food+medical+other) 2 Person Household Monthly Cost	Monthly Transportation Cost	Credit Card Monthly Debt Payment	Total Expenses	Disposable Household Income
Broward County-Renters	\$ 3,405	\$ 1,271.00	37%	\$1,862	\$ 991	\$ 309	\$ 3,162	\$ (1,028)
Broward County-Owners	\$ 5,602	\$ 1,753.00	31%	\$ 1,862	\$ 991	\$ 309	\$ 3,162	\$ 687

APPENDIX C: NEW JOBS BY INDUSTRY SECTOR AND RESIDENTIAL PROTOTYPES

NAICS Sector	Description	Single Family Large (≥3,000 SF)	Single Family Small (<3,000 SF)	Townhouse	Mobile Homes	Condominiums	Cooperatives	Multi Family <10 Units	Multi Family ≥ 10 Units
11	Agriculture, Forestry, Fishing and Hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	Mining, Quarrying, and Oil and Gas Extraction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	Utilities	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	Construction	1.1	0.5	0.4	0.1	0.8	0.2	0.3	0.3
31-33	Manufacturing	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.0
42	Wholesale Trade	2.0	0.9	0.8	0.2	1.4	0.4	0.5	0.6
44-45	Retail Trade	15.3	6.8	6.3	1.5	11.0	2.9	4.0	4.3
48-49	Transportation and Warehousing	2.2	0.9	0.9	0.2	1.6	0.4	0.5	0.6
51	Information	1.1	0.5	0.5	0.1	0.8	0.2	0.3	0.3
52	Finance and Insurance	6.3	2.5	2.3	0.5	4.6	1.0	1.5	1.6
53	Real Estate and Rental and Leasing	5.6	3.3	3.1	1.0	4.1	1.8	2.2	2.4
54	Professional, Scientific, and Technical Services	4.2	1.8	1.7	0.4	3.1	0.8	1.0	1.1
55	Management of Companies and Enterprises	0.4	0.2	0.1	0.0	0.3	0.1	0.1	0.1
56	Administrative and Support and Waste Management and Remediation Services	6.1	2.7	2.5	0.6	4.4	1.2	1.6	1.7
61	Educational Services	2.9	1.1	1.0	0.3	2.1	0.5	0.6	0.6
62	Health Care and Social Assistance	17.8	6.8	6.3	1.6	12.9	4.4	4.5	4.9
71	Arts, Entertainment, and Recreation	2.2	0.7	0.7	0.1	1.6	0.3	0.5	0.5
72	Accommodation and Food Services	13.2	5.4	5.0	1.1	9.5	2.1	2.8	3.1
81	Other Services (except Public Administration)	8.8	3.8	3.6	0.8	6.4	1.6	2.3	2.5
92	Public Administration	1.1	0.5	0.4	0.1	0.8	0.2	0.3	0.3
Total		90.4	38.4	35.5	8.7	65.2	18.1	23.0	24.9

APPENDIX D: OCCUPATION DISTRIBUTION BY INDUSTRY SECTOR

Industry by Occupation	Construction	Wholesale Trade	Retail Trade	Finance and Insurance	Professional, Scientific, and Technical Services	Admin. and Support and Waste Mgmt and Remed. Services	Educational Services	Health Care and Social Assistance	Accommodation and Food Services	Public Administration
Total Employed	46050	47010	110910	36110	56580	80130	56460	105740	85180	42380
Management	9%	5%	2%	6%	9%	3%	2%	3%	2%	4%
Business/ Financial Operations	4%	8%	1%	22%	15%	6%	4%	2%	0%	9%
Computer and Mathematical	0%	3%	0%	4%	12%	3%	2%	1%	0%	2%
Architecture and Engineering	1%	1%	0%	0%	6%	0%	0%	0%	-	2%
Life/ Physical/ Social Science	0%	0%	0%	0%	1%	0%	1%	0%	-	2%
Community/ Social Services	0%	0%	0%	0%	0%	0%	2%	6%	-	4%
Legal	0%	NA	0%	1%	15%	0%	0%	0%	0%	3%
Education	0%	0%	0%	0%	NA	0%	60%	3%	0%	2%
Arts/Entertainment/ Sports/ Media	NA	1%	1%	0%	5%	1%	1%	0%	0%	1%
Healthcare Practitioners and Technical	0%	1%	3%	1%	3%	1%	1%	36%	0%	3%
Healthcare Support	0%	0%	0%	0%	1%	1%	0%	18%	0%	1%
Protective Service	0%	0%	0%	0%	0%	10%	1%	0%	1%	28%
Food Preparation and Serving	0%	0%	3%	0%	0%	0%	4%	2%	79%	1%
Building/ Grounds	0%	0%	1%	NA	0%	18%	1%	2%	4%	2%
Personal Care and Service	0%	0%	0%	0%	NA	2%	3%	5%	1%	4%
Sales	3%	30%	55%	24%	5%	14%	1%	1%	5%	NA
Office / Admin Support	10%	29%	18%	41%	24%	26%	9%	17%	4%	17%
Farming, Fishing and Forestry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Construction and Extraction	58%	NA	NA	0%	1%	3%	1%	0%	NA	4%
Installation/ Maintenance	10%	5%	5%	0%	1%	3%	3%	1%	1%	4%
Production	1%	4%	2%	0%	1%	1%	0%	0%	0%	1%
Transportation and Material Moving	2%	12%	8%	0%	0%	7%	3%	1%	2%	4%
Totals	100%	100%	99%	98%	100%	100%	100%	100%	100%	99%

APPENDIX E: MEDIAN WAGES BY SECTOR AND OCCUPATION CATEGORY

Industry by Occupation	Construction	Wholesale Trade	Retail Trade	Finance and Insurance	Professional, Scientific, and Technical Services	Admin. and Support and Waste Mgmt and Remediation Services	Educational Services	Health Care and Social Assistance	Accommodation and Food Services	Public Administration
Management	\$86,420	\$132,580	\$101,859	\$121,017	\$105,630	\$118,545	\$122,863	\$110,058	\$61,466	\$113,030
Business/ Financial Operations	\$62,410	\$64,463	\$61,194	\$67,572	\$59,784	\$64,840	\$61,552	\$57,713	\$54,658	\$65,408
Computer and Mathematical	\$58,193	\$66,192	\$47,611	\$84,443	\$71,031	\$71,627	\$58,569	\$74,592		\$76,547
Architecture and Engineering	\$60,880	\$72,105		\$0	\$66,423	\$69,657		\$70,358		\$64,545
Life/ Physical/ Social Science		\$57,878		\$0	\$45,415	\$34,474	\$40,833	\$61,191		\$60,467
Community/ Social Services				\$0		\$39,286	\$69,332	\$37,266		\$41,116
Legal	NA	\$103,608		\$65,247	\$65,375	\$37,957	\$116,934	\$98,947		\$60,621
Education	\$0			\$0	\$37,026	\$25,174	\$48,840	\$25,485		\$44,637
Arts/Entertainment/ Sports/ Media	\$30,003	\$46,372	\$28,206	\$61,954	\$46,458	\$38,346	\$44,276	\$59,742	\$40,336	\$56,702
Healthcare Practitioners and Technical	\$0	\$66,338	\$38,048	\$107,823	\$51,347	\$50,900	\$67,956	\$64,802		\$50,740
Healthcare Support	\$0		\$27,317	\$0	\$31,618	\$35,269	\$29,757	\$29,826	\$68,691	\$28,314
Protective Service	\$0	\$28,681	\$29,387	\$0		\$24,434	\$32,712		\$27,213	\$70,715
Food Preparation and Serving	\$0		\$25,327	\$0		\$25,100	\$23,959	\$24,423	\$20,780	\$23,834
Building/ Grounds	\$29,795	\$24,447	\$22,658	\$36,174	\$22,600	\$23,810	\$29,200	\$26,216	\$22,232	\$33,015
Personal Care and Service	\$0		\$23,485	\$0	\$27,947	\$19,295	\$21,115	\$25,083	\$24,918	\$30,090
Sales	\$45,743	\$50,518	\$22,943	\$51,216	\$61,299	\$27,712	\$45,476	\$59,675	\$19,642	\$29,980
Office / Admin Support	\$36,407	\$34,748	\$27,420	\$36,022	\$36,724	\$30,968	\$34,803	\$34,375	\$25,152	\$41,125
Farming, Fishing and Forestry	\$0			\$0						\$34,944
Construction and Extraction	\$38,569	\$45,467	\$39,905	\$0	\$61,317	\$35,289	\$60,305	\$45,757	\$38,600	\$49,005
Installation/ Maintenance	\$41,717	\$42,713	\$36,687	\$0	\$40,750	\$39,737	\$36,388	\$46,253	\$34,596	\$47,681
Production	\$39,461	\$34,529	\$30,328	\$0	\$38,798	\$27,213	\$59,486	\$26,081	\$23,345	\$51,310
Transportation and Material Moving	\$35,923	\$31,888	\$22,711	\$0	\$25,294	\$28,154	\$31,972	\$29,983	\$19,768	\$43,626