

Affordable Housing Gap and Economic Analysis



Town of Chapel Hill
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Town of Chapel Hill



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A. Introduction

The Town of Chapel Hill (Town) retained David Paul Rosen & Associates (DRA) to prepare a Comprehensive Affordable Housing Analysis for the Town. As part of the study, DRA prepared an affordability gap analysis that calculates the difference between the amount households at alternative income levels can afford to pay toward housing and the actual development cost of typical housing units of various types. DRA also examined potential incentives and financing strategies that could be used to incentivize the development of affordable housing in the Town. This report summarizes the assumptions, methodology and findings of the affordability gap and economic analysis.

The first step in the gap analysis establishes the amount a tenant or homebuyer can afford to contribute to the cost of renting or owning a dwelling unit based on established State and federal standards. Income levels, housing costs and rents are defined using 2016 published data for Chapel Hill.

The second step estimates the costs of providing affordable housing units in Chapel Hill. For this purpose, DRA estimated the cost in Chapel Hill in 2016 to construct new rental and ownership prototypical housing developments.

The third step in the gap analysis establishes the housing expenses borne by the tenants and owners. These costs can be categorized into operating costs, and financing or mortgage obligations. Operating costs are the maintenance expenses of the unit, including utilities, property maintenance, property taxes, management fees, property insurance, replacement reserves, and insurance. For the rental prototype examined in this analysis, DRA assumed that the landlord pays all but certain tenant-paid utilities as an annual operating cost of the unit paid from rental income. For owner prototypes, DRA assumed the homebuyer pays all operating and maintenance costs for the home.

Financing or mortgage obligations are the costs associated with the purchase or development of the housing unit itself. These costs occur when all or a portion of the development cost is financed. This cost is always an obligation of the landlord or owner. Supportable financing from affordable sales prices or rents is deducted from the total development cost, less any owner equity or downpayment, to determine the affordability gap associated with developing those units.

For rental housing prototypes, the gap analysis calculates the difference between total development costs and the conventional mortgage supportable by net operating income from restricted rents. For owners, the gap is the difference

between development costs and the supportable mortgage plus the buyer's down payment.

DRA examined the estimated subsidy requirements, or affordability gaps, for five prototypical housing projects on actual sites in Chapel Hill. These prototypes are detailed in **Table 1**. The prototypes are described briefly as follows:

Prototype 1, Ephesus Fordham: This prototype assumes higher density rental housing of approximately 40 units per acre is built on a 3.40-acre site in the Ephesus Fordham district, replacing existing older and obsolete development. DRA also modeled a second version of the prototype with a 25% density bonus to determine whether the additional density would provide sufficient value to the developer to allow a portion of the units to be affordable.

Prototype 2, Graig-Gomains: This prototype assumes redevelopment of the approximately 7-acre Craig-Gomains public housing site with a mix of rental and owner development. The density of development would be increased from the existing low intensity development to accommodate replacement of the existing units, the development of additional rental units, and to allow a portion of the site to be sold or leased for market-rate owner housing. DRA examined the strategy of using funds raised by sale of the owner parcel, as well as tax increment from development of the market rate housing on the owner parcel, to cross-subsidize the new rental development. This is a strategy that could potentially be repeated on other public housing sites in the Town.

Prototype 3, Legion Road: This prototype represents a large-scale market-rate rental development on the 36-acre Legion Road site. DRA also modeled a second version of the prototype with a 25% density bonus to determine whether the additional density would provide sufficient value to the developer to allow a portion of the units to be affordable.

Prototype 4, Greene Tract: This prototype models affordable rental and owner housing on the 18-acre portion of the 100-acre Greene Tract jointly owned by Chapel Hill, Carrboro and Orange County that has been designated for affordable housing development.

Prototype 5, Sunrise: This prototype models affordable ownership development on the approximately 39-acre Sunrise site, a portion of which is owned by Habitat for Humanity. It assumes a portion of the site is developed by Habitat for Humanity with affordable townhomes and the remainder of the site is developed with market-rate single-family homes.

DRA examined the affect on the gaps of potential economic incentives for affordable rental housing that might be applicable to one or more of the prototypes. These economic incentives include the following:

1. Leveraged financing for affordable rental housing provided by the Low Income Housing Tax Credit Program, the most valuable source of leveraged financing available today;
2. HUD Rental Assistance Demonstration Program (RAD) for Public Housing Redevelopment;
3. Tax increment financing; and
4. Density bonus

Table 1
Development Prototypes
Chapel Hill Affordability Gap and Economic Analysis

	Prototype 1 Ephesus Fordham	Prototype 1 w/ Density Bonus	Prototype 2 Craig-Gomains		Prototype 3 Legion Road	Prototype 3 w/ Density Bonus	Prototype 4 Greene Tract		Prototype 5 Sunrise	
Total Housing Unit Count	136	170	60	40	575	719	40	60	45	45
Tenure (Renter/Owner)	Rental	25% Density Bonus Rental	Rental	Owner	Rental	25% Density Bonus Rental	Rental	Owner	Owner	Owner
Zoning										
Product Description	Stacked Flat Apts. Elevator-Served Structured Parking	Stacked Flat Apts. Elevator-Served Structured Parking	Stacked Flat Apts. Walk-Ups Surface Parking	TH 2 Story Garages	Stacked Flat Apts. Walk-Ups Surface Parking	Stacked Flat Apts. Walk-Ups Surface Parking	TH 2 Story Garages	TH 2 Story Garages	SFD 2 Story Garages	TH 2 Story Garages
Total Site Area (Acres)	3.40 Acres	3.40 Acres	2.80 Acres	4.20 Acres	36.00 Acres	36.00 Acres	6.30 Acres	11.70 Acres	23.40 Acres	15.60 Acres
Total Site Area (SF)	148,104	148,104	121,968 40% of 7 Acres	182,952 60% of 7 Acres	1,568,160	1,568,160	274,428 35% of 18 Acres	509,652 65% of 18 Acres	1,019,304 60% of 39 Acres	679,536 40% of 39 Acres
Density (Units Per Acre)	40	50	21	10	16	20	6	5	2	3
Construction Type	Type IIIA	Type IIIA	Type V	Type V	Type V	Type V	Type V	Type V over Type I	Type V	Type V
Parking Type	Structured	Structured	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Approximate Building Stories	5 Stories	6 Stories	2 Stories	2 Stories	4 Stories	4 Stories	2 Stories	2 Stories	2 Stories	2 Stories
Net Rentable SF Residential	110,600 SF	138,350 SF	52,500 SF	48,400 SF	502,900 SF	628,900 SF	35,000 SF	72,600 SF	67,800 SF	54,300 SF
Total Net Bldg. SF	110,600 SF	138,350 SF	52,500 SF	48,400 SF	502,900 SF	628,900 SF	35,000 SF	72,600 SF	67,800 SF	54,300 SF
Building Efficiency Ratio (%)	75%	75%	75%	75%	75%	75%	75%	70%	100%	100%
Gross Building SF (Excluding Parking)	147,467 SF	184,467 SF	70,000 SF	64,533 SF	670,533 SF	838,533 SF	46,667 SF	103,714 SF	67,800 SF	54,300 SF
Unit Bedroom Count Distribution										
Studio/Loft	10%	10%	0%	0%	0%	0%	0%	0%	0%	0%
One Bedroom	25%	25%	25%	0%	25%	25%	25%	0%	0%	0%
Two Bedroom	50%	50%	50%	30%	50%	50%	50%	30%	30%	30%
Three Bedroom	15%	15%	25%	70%	25%	25%	25%	70%	70%	70%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Units by BR Count										
Studio/Loft	14	17	0	0	0	0	0	0	0	0
One Bedroom	34	43	15	0	144	180	10	0	0	0
Two Bedroom	68	85	30	12	288	360	20	18	14	14
Three Bedroom	20	25	15	28	143	179	10	42	31	31
Total Residential Units	136	170	60	40	575	719	40	60	45	45
Unit Size (Net SF)										
Studio/Loft	500 SF	500 SF	500 SF		500 SF	500 SF	500 SF			
One Bedroom	700 SF	700 SF	700 SF		700 SF	700 SF	700 SF			
Two Bedroom	850 SF	850 SF	850 SF	1,000 SF	850 SF	850 SF	850 SF	1,000 SF	1,300 SF	1,000 SF
Two Bedroom/Two Bath	0 SF	0 SF	0 SF		0 SF	0 SF	0 SF			
Three Bedroom	1,100 SF	1,100 SF	1,100 SF	1,300 SF	1,100 SF	1,100 SF	1,100 SF	1,300 SF	1,600 SF	1,300 SF
Average Unit Size	813 SF	814 SF	875 SF	1,210 SF	875 SF	875 SF	875 SF	1,210 SF	1,507 SF	1,207 SF
Parking Requirements										
Required Parking Spaces (1)	163	204	75	57	719	899	50	86	64	64
Proposed Reduction in Parking (%)	40%	40%	25%	25%	0%	10%	0%	0%	0%	0%
Proposed Parking Spaces	98	122	56	43	719	809	50	86	64	64
Structured Parking Spaces	98	122	0	0	0	0	0	0	0	0

(1) Based on the following minimum parking requirements (spaces per dwelling unit) from the Town of Chapel Hill form-based zoning code:

	Efficiency, 1 BR	2 BR	3 BR	4+ BR
Off-street vehicle parking spaces reqd	1	1.25	1.5	1.67

Source: Town of Chapel Hill; DRA.

C. Income Targeting and Affordable Housing Cost

1. Target Income Levels

The affordability gap analysis analyzes income limits as commonly defined by the Department of Housing and Urban Development (HUD), the Low Income Housing Tax Credit (LIHTC) Program, and most affordable housing assistance programs. Very low income households are defined as households with incomes less than 50 percent of area median income (AMI). Low income households are defined as households with incomes between 51 and 80 percent of AMI. Moderate income households are defined as households with incomes between 81 and 120 percent of AMI. All of these income limits are adjusted by household size using HUD family size adjustment factors.

Table 2 shows HUD 2016 income limits for the Town of Chapel Hill by income level and household size. HUD publishes income limits for the 30% of AMI, 50% of AMI and 80% of AMI categories. This analysis also looks at a median income category for households at 100 percent of AMI; a moderate income category at 120% of AMI; and a 60 percent of AMI category, which is widely used in the LIHTC program.

The 2016 HUD median household income for the Durham-Chapel Hill HUD Metro FMR Area (HMFA)¹ is \$74,900 for a four-person household. However, the extremely low (30% AMI), very low (50% AMI) and low income (80% AMI) limits are effectively based on a median income of \$70,700, so this is the figure used to calculate the 60% AMI, 100% AMI and 120% AMI income limits.

¹FMR stands for Fair Market Rent. The Durham-Chapel Hill HMFA is a HUD-defined metropolitan area.

Table 2
Affordable Housing Income Limits by Percent of Area Median Income (AMI)
and Household Size¹
Town of Chapel Hill
2016

Household Size	30% AMI	50% AMI	60% AMI	80% AMI	100% AMI	120% AMI
1 Person	\$14,850	\$24,750	\$29,700	\$39,600	\$49,500	\$59,400
2 Persons	\$17,000	\$28,300	\$34,000	\$45,250	\$56,600	\$67,900
3 Persons	\$20,160	\$31,850	\$38,200	\$50,900	\$63,650	\$76,350
4 Persons	\$24,300	\$35,350	\$42,400	\$56,550	\$70,700	\$84,850
5 Persons	\$28,440	\$38,200	\$45,800	\$61,100	\$76,350	\$91,600
6 Persons	\$32,580	\$41,050	\$49,200	\$65,600	\$82,000	\$98,400

Source: HUD extremely low income (30% AMI), very low income (50% AMI) and low income (80% AMI) limits for Chapel Hill. Other income limits calculated based on 2016 HUD median income of \$70,700, percent AMI and HUD household size adjustment factors, rounded to the nearest \$50.

2. Affordable Housing Cost Definitions

Calculation of affordable rents and home prices requires defining affordable housing expense for renters and owners. Affordable housing expense for renters is defined to include rent plus utilities, which is standard for affordable housing programs and practice. For owners, affordable housing expense is defined to include mortgage principal and interest, property taxes and homeowner's insurance. For renters, affordable housing expense is calculated at 30 percent of household income, the standard of virtually all rental housing programs. For owners, affordable housing expense is also calculated at 30 percent of household income.

Table 3 shows affordable housing cost at the 30 percent of gross income standard, for a range of household sizes and percent of AMI categories.

Table 3 Affordable Housing Cost¹ by Percent of AMI and Household Size Town of Chapel Hill Housing Affordability Gap Analysis 2016						
Household Size	30% AMI	50% AMI	60% AMI	80% AMI	100% AMI	120% AMI
1 Person	\$371	\$619	\$742	\$990	\$1,237	\$1,485
2 Persons	\$424	\$707	\$848	\$1,131	\$1,414	\$1,697
3 Persons	\$477	\$795	\$954	\$1,273	\$1,591	\$1,909
4 Persons	\$530	\$884	\$1,061	\$1,414	\$1,768	\$2,121
5 Persons	\$573	\$954	\$1,145	\$1,527	\$1,909	\$2,291
6 Persons	\$615	\$1,025	\$1,230	\$1,640	\$2,050	\$2,460

¹Affordable housing cost defined as 30% of gross income spent on housing.
Sources: HUD 2016 income limits by household size and percent of AMI (AMI); DRA.

3. Occupancy Standards

Because income definitions for affordable housing assistance programs vary by household size, calculation of affordable rents and affordable owner housing costs requires the definition of occupancy standards (the number of persons per unit) for each unit size. For the purposes of this analysis, affordable housing cost for the multifamily rental prototype is based on an occupancy standard of 1.5 persons per bedroom. This definition is consistent with the most valuable leverage sources for affordable rental housing: the Low Income Housing Tax Credit and tax-exempt bond programs. For the ownership prototypes, affordable housing cost is calculated based on an occupancy standard of one person per bedroom.

4. Utility Allowances

Affordable net rents are calculated by subtracting allowances for the utilities paid directly by the tenants from the gross rent (or affordable housing cost).

For purposes of the renter gap analysis, we incorporated utility allowances effective January 1, 2015 from the Durham Housing Authority (DHA) for locations

served by Duke Energy, summarized in **Table 4**. These utility allowances are similar to the 2015 utility allowance used for Greenfield Place affordable family housing development, which are based on Duke Energy estimates.

Actual utility allowances depend upon a variety of factors, including the energy provider, the utilities that are paid by the residents (e.g., water, gas, electric, sewer, trash), the type of appliances and heating units incorporated in the units, and whether appliances and heating units require electricity or gas.

This analysis assumes that the resident pays for electric heating, air conditioning, “other electric,” and natural gas cooking and water heating. We assume the landlord pays for trash, water and sewer.

Table 4 Monthly Utility Allowances Used for Affordability Gap Analysis Town of Chapel Hill 2015	
Unit Bedroom Count	Rental Prototype¹
Studio	\$66
One Bedroom	\$76
Two Bedroom	\$93
Three Bedroom	\$112

¹Assumes electric heating, other electric, air conditioning, natural gas cooking and water heating for apartment units (5+ units per building).

Sources: Durham Housing Authority, effective 1/1/15; DRA.

5. Affordable Net Rents

Table 5 summarizes affordable monthly net rents by income level based on the assumptions described above.

Table 5 Affordable Net Rents by Percent of AMI and Unit Bedroom Count¹ Town of Chapel Hill Housing Affordability Gap Analysis 2016						
Household Size	30% AMI	50% AMI	60% AMI	80% AMI	100% AMI	120% AMI
Studio	\$305	\$553	\$676	\$924	\$1,171	\$1,419
1 Bedroom	\$322	\$587	\$719	\$985	\$1,250	\$1,515
2 Bedroom	\$384	\$702	\$861	\$1,180	\$1,498	\$1,816
3 Bedroom	\$439	\$807	\$991	\$1,359	\$1,726	\$2,094

¹HUD published limits, adjusted proportionally for percentage of AMI category. Gross rents are calculated assuming an occupancy standard of 1.5 persons per bedroom (1 person for studio units). Net rents are calculated assuming 30% of gross income spent on rent and then deducting the utility allowances shown above.

Source: DRA.

6. Affordable Home Prices

For owners, the affordable monthly mortgage payment (principal plus interest) is calculated by deducting estimated monthly costs for property insurance (\$45), estimated monthly HOA and Stewardship Fees (\$200), and property taxes (based on an annual assessment equal to 1.61 percent of the affordable home price) from monthly affordable housing cost. **Table 6** shows affordable home prices by income level, based on the assumptions described above.

The maximum affordable home price is estimated assuming a 5 percent owner downpayment, a 5.0 percent fixed mortgage interest rate and 30-year mortgage term and amortization.

Table 6 Affordable Home Prices by Percent of AMI and Unit Bedroom Count¹ Town of Chapel Hill Housing Affordability Gap Analysis 2016				
Unit Size	Very Low Income 50% AMI	Low Income 80% AMI	Moderate Income 100% AMI	Moderate Income 120% AMI
1 Bedroom	\$66,800	\$185,800	\$226,700	\$267,600
2 Bedrooms	\$79,500	\$206,300	\$252,300	\$298,200
3 Bedrooms	\$92,300	\$226,700	\$277,800	\$328,900
4 Bedrooms	\$133,200	\$234,200	\$330,600	\$369,200

¹Affordable mortgage principal and interest calculated by deducting the following from affordable owner monthly housing cost: annual property taxes and assessments at 1.61 of affordable home price; HOA and Stewardship dues of \$200 per month, and property insurance of \$45 per month. Affordable mortgage calculated assuming 5% owner downpayment, 5.0% mortgage interest rate and 30-year mortgage term and amortization.

Source: DRA.



D. Development Costs

Development costs for the housing prototype were estimated based on interviews with local Chapel Hill area developers and affordable housing stakeholders, as well as available project pro formas. The development cost assumptions and resulting development budgets are shown in **Table 7**.

1. Property Acquisition Costs

DRA estimated per unit land costs based on interviews with local developers active in the Chapel Hill area and a review of available pro formas. DRA also used the Dataquick search engine to identify sales of vacant land in Chapel Hill, but was unable to find any recent sales of vacant land, given the scarcity of vacant sites in the Town.

Based on available data, DRA estimated market land costs or values of \$25,000 per unit for the rental prototypes and \$33,000 to \$40,000 per unit for the owner townhome and single-family prototypes, depending upon the site. Land costs were not included for affordable developments on publicly owned sites, including the Prototype 2 (Craig-Gomains) public housing site and the Greene Tracts.

2. Hard and Soft Construction Costs

Construction hard costs are estimated based on interviews with local nonprofit and for profit developers and review of available pro formas. DRA estimated hard construction costs for buildings and parking, permits and fees, architecture and engineering, other soft costs and construction financing costs for each of the pro formas.

For the multifamily rental new construction prototype, we estimate on-site improvement costs, building shell costs, permits and fees, architecture and engineering, other soft costs, and construction financing costs.

The developer fee assumed for the multifamily rental new construction prototype is equal to 10 percent of total hard and soft costs. For the tax credit scenarios, the fee is limited to a maximum of \$13,000 per unit, not to exceed a total of \$1.3 million for 9 percent tax credit projects and \$1.9 million for bond projects. These limits would not apply directly to unleveraged market-rate prototypes.

Table 7
Development Cost Assumptions and Budgets
Chapel Hill Affordability Gap and Economic Analysis

	Prototype 1	Prototype 1	Prototype 2		Prototype 3	Prototype 3	Prototype 4		Prototype 5	
	Ephesus Fordham	w/ Density Bonus	Craig-Gomains		Legion Road	w/ Density Bonus	Greene Tract		Sunrise	
	Rental Stacked Flat Apts. Structured Parking	Rental Stacked Flat Apts. Structured Parking	Rental Stacked Flat Apts. Surface Parking	Owner TH	Rental Stacked Flat Apts.	Rental Stacked Flat Apts.	Rental TH	Owner TH	Owner SFD	Owner TH
ASSUMPTIONS										
Total Residential Units	136	170	60	40	575	719	40	60	45	45
Average Unit Size (Net SF)	813	814	875	1,210	875	875	875	1,210	1,507	1,207
Residential Net SF (Living Area)	110,600	138,350	52,500	48,400	502,900	628,900	35,000	72,600	67,800	54,300
Total Net SF	110,600	138,350	52,500	48,400	502,900	628,900	35,000	72,600	67,800	54,300
Total Gross SF Building Area (Excluding Parking)	147,467	184,467	70,000	64,533	670,533	838,533	46,667	103,714	67,800	54,300
Structured Parking Spaces	98	122	0	0	0	0	0	0	0	0
Surface Parking Spaces	0	0	56	43	719	809	50	86	64	64
Total Parking Spaces	98	122	56	43	719	809	50	86	64	64
Site Area (SF)	148,104	148,104	121,968	182,952	1,568,160	1,568,160	274,428	509,652	1,019,304	679,536
Approximate Building Stories	5	6	2	2	4	4	2	2	2	2
Hard/Direct Cost Assumptions										
Land Price	Per Hsg. Unit \$25,000	\$20,000	\$0	\$40,000	\$25,000	\$20,000	\$0	\$0	\$40,000	\$0
	Per Site SF \$22.96	\$22.96	\$0.00	\$8.75	\$9.17	\$9.17	\$0.00	\$0.00	\$1.77	\$0.00
Site Improvements	Per Hsg. Unit \$8,000	\$8,000	\$8,000	\$15,000	\$8,000	\$8,000	\$15,000	\$15,000	\$15,000	\$15,000
Building Hard Construction	Per Net SF \$150	\$150	\$75	\$100	\$75	\$75	\$75	\$100	\$100	\$100
Soft/Indirect Cost Assumptions										
Archit./Engin./Consultants	% of Hard Costs 4.0%	4.0%	4.0%	2.0%	4.0%	4.0%	3.0%	2.0%	2.0%	2.0%
Permits and Fees	Cost Per Hsg. Unit \$3,000	\$3,000	\$3,000	\$15,000	\$3,000	\$3,000	\$3,000	\$15,000	\$20,000	\$20,000
Other Soft Costs (1)	% of Hard Costs 12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Construction Financing Assumptions										
Loan Origination Fees	% of Hard + Soft Costs 1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Construction Interest Rate	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Construction Period	Months 24	24	12	12	24	24	12	12	12	12
Lease-Up/Sales Period	Months 6	9	3	3	9	12	3	3	3	3
Ave. Loan Balance--Constr.	% of Hard + Soft Costs 60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
Ave. Loan Balance--Lease-Up	% of Hard + Soft Costs 95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Developer Fee/Overhead & Profit	% of Hard + Soft Costs 10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Assumed Investment Period (Years)	2.5	2.8	1.3	1.3	2.8	3.0	1.3	1.3	1.3	1.3
Equity Investment	% of TDC 30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Return on Equity (Equity Yield)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Cap Rate	Low Scenario 5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%
DEVELOPMENT BUDGET										
Land Acquisition	\$3,400,000	\$3,400,000	\$0	\$1,601,000	\$14,380,000	\$14,380,000	\$0	\$0	\$1,804,000	\$0
Demolition Costs (2)	\$0	\$0	\$10,000	\$15,000	\$0	\$0	\$0	\$0	\$0	\$0
Site Improvements	\$1,088,000	\$1,360,000	\$480,000	\$600,000	\$4,600,000	\$5,752,000	\$600,000	\$900,000	\$675,000	\$675,000
Building Construction Costs	\$16,590,000	\$20,753,000	\$5,250,000	\$6,453,000	\$50,290,000	\$62,890,000	\$3,500,000	\$10,371,000	\$6,780,000	\$5,430,000
Archit./Engin./Consultants	\$663,600	\$830,120	\$210,000	\$129,060	\$2,011,600	\$2,515,600	\$105,000	\$207,420	\$135,600	\$108,600
Permits and Fees	\$408,000	\$510,000	\$180,000	\$600,000	\$1,725,000	\$2,157,000	\$120,000	\$900,000	\$900,000	\$900,000
Other Soft Costs (1)	\$843,120	\$1,020,520	\$229,600	\$173,380	\$2,770,800	\$3,320,880	\$123,000	\$225,420	\$185,180	\$122,100
Loan Origination Fees	\$229,927	\$278,736	\$63,596	\$95,714	\$757,774	\$910,155	\$44,480	\$126,038	\$104,798	\$72,357
Construction Interest During Construction	\$1,103,651	\$1,337,935	\$152,630	\$229,715	\$3,637,315	\$4,368,743	\$106,752	\$302,492	\$251,515	\$173,657
Construction Interest During Lease-Up/Sales	\$436,862	\$794,399	\$60,416	\$90,929	\$2,159,656	\$3,458,588	\$42,256	\$119,736	\$99,558	\$68,739
Developer Fee/Overhead & Profit	\$2,476,316	\$3,028,471	\$663,624	\$998,780	\$8,233,215	\$9,975,297	\$464,149	\$1,315,211	\$1,093,565	\$755,045
Total Development Costs, Including Land	\$27,239,475	\$33,313,181	\$7,299,867	\$10,986,577	\$90,565,360	\$109,728,263	\$5,105,637	\$14,467,318	\$12,029,215	\$8,305,498
TDC Per Housing Unit	\$200,290	\$195,960	\$121,664	\$274,664	\$157,505	\$152,612	\$127,641	\$241,122	\$267,316	\$184,567
TDC per NSF Living Area	\$246	\$241	\$139	\$227	\$180	\$174	\$146	\$199	\$177	\$153
Total Development Costs, Excluding Land	\$23,839,475	\$29,913,181	\$7,299,867	\$9,385,577	\$76,185,360	\$95,348,263	\$5,105,637	\$14,467,318	\$10,225,215	\$8,305,498

(1) If parking cost shown as \$0, parking cost is included in building construction cost.
(2) Demolition cost estimated using on-line calculator localized to Raleigh, NC assumption 1,100 square feet per unit for 40 existing units; allocated on a per acre basis to the owner and renter housing prototypes.
Source: DRA

For the Craig-Gomains public housing, estimated demolition costs to remove the existing 40 public housing units on the site were estimated using a demolition calculator localized to the Raleigh, North Carolina area. Demolition costs are estimated at \$25,000.

The hard cost assumptions for the gap analysis do not assume payment of prevailing wages. While the use of 9 percent tax credits by themselves does not trigger a requirement for prevailing wages, to the extent the gap is filled with other forms of public subsidy, then the payment of prevailing wages may be required.

E. Operating and Financing Cost Assumptions

1. Rental Prototype

Based on interviews with nonprofit and for-profit rental housing operators in the Chapel Hill area, annual operating costs are estimated at \$4,400 per unit exclusive of property taxes and replacement reserves. Property taxes on rental units that do not qualify for a tax exemption are estimated at \$3,400 per year, higher than some surrounding communities due to Chapel Hill's higher property taxes. This brings total operating costs for market-rate units to \$7,800 per unit. Replacement reserves for rental new construction are estimated at \$250 per unit per year.

A vacancy allowance of 7 percent is used for the multifamily rental prototypes under 9% tax credit scenarios, as required by NCHFA in the 2016 tax credit QAP for North Carolina.

2. Financing Costs

Financing costs vary according to the amount of equity invested, the term of the loan, the annual interest rate, and, in the case of ownership projects, mortgage insurance rates, if required. For purposes of this gap analysis, the amount of the first mortgage for the rental prototypes is assumed to be the amortized debt that may be supported by tenant net affordable rents. The balance of project financing is the affordability cost or gap.

Construction loan interest for the rental new construction prototype is calculated based on an average construction loan balance of 60 percent and a 4 percent construction interest rate. The construction and lease-up period is assumed to vary by prototype from approximately 15 months on the smaller low density

prototypes to 3 years for the larger higher density prototypes. We use a 6.0 percent permanent loan interest rate for the rental prototypes with a 30-year amortization.

For the owner prototypes, DRA assumed homebuyer mortgages based on an effective fixed interest rate of 5.0 percent (combined loan interest and mortgage insurance where appropriate) for 30 years. We also assume a 5 percent downpayment on the owner prototypes.

F. Summary of Owner Affordability Gaps

Table 8 summarizes estimated per unit subsidy requirements to make the owner housing prototypes affordable based on their estimated development costs in comparison to affordable home prices at three income levels: 80% of AMI, 100% of AMI and 120% of AMI. For the prototypical Sunrise townhomes (assumed to be developed by Habitat for Humanity), the gaps are also shown at 50% AMI, which is the typical average target income for Habitat.

Renter affordability gaps are described in the next section.

Income Level	Greene Tract ¹		Sunrise SFD ²		Sunrise TH ¹	
	Two Bedroom	Three Bedroom	Two Bedroom	Three Bedroom	Two Bedroom	Three Bedroom
50% AMI	--	--	--	--	\$7,500	\$12,100
80% AMI	\$50,500	\$89,800	\$81,600	\$114,300	\$0	\$0
100% AMI	\$4,500	\$38,600	\$35,600	\$63,100	\$0	\$0
120% AMI	\$0	\$0	\$0	\$12,100	\$0	\$0

¹Development costs include no land costs.

²Development costs include market land cost/value estimated at \$33,000 per unit.

Source: DRA.

G. Leveraged Financing Tools and Economic Incentives for Affordable Rental Housing

DRA analyzed the value of leverage financing tools and economic incentives that potentially could be used to close gap on the development of new affordable rental housing in Chapel Hill. The financing sources and incentives analyzed include the following:

1. Low Income Housing Tax Credits (LIHTCs) and tax-exempt bonds;
2. HUD Rental Assistance Demonstration (RAD) Program for public housing;
3. Tax increment financing; and
4. Density bonus.

The RAD program and tax increment financing are described in more detail in the New Revenue Sources report prepared as part of the study.

1. Low Income Housing Tax Credits (LIHTCs) and Tax-Exempt Bonds

The Low Income Housing Tax Credit (LIHTC) program is the most valuable source of leveraged financing for affordable housing available today in the U.S. The LIHTC program offers both 9% and 4% tax credits. The 9% tax credit program is the most valuable, but allocations in North Carolina and across the country are highly competitive. An allocation of 4% tax credits generates less than half the amount of tax credits and equity as the 9% program, but is automatically provided with an allocation of multifamily tax-exempt bonds, which are generally plentiful as long as program requirements are met.

Tax credit pricing under the 9% and 4% tax credit scenarios is estimated based on recent discussions with local nonprofit housing developers, indicating estimated pricing for 9% tax credits is \$1.05 per dollar of credits. Tax credit equity pricing for 4% tax credits is estimated at \$1.10.

2. Prevailing Wages

As noted above, the affordability gap analysis evaluates market-rate prototypes and does not assume prevailing wages. Private residential projects built on private property are not subject to prevailing wages. The use of 9 percent tax credits or 4 percent tax credits and tax-exempt bonds do not alone trigger prevailing wages. However, certain types of public gap funding do require prevailing wages. We have not modeled prevailing wages but note that they may apply in some circumstances.

3. Eligible Basis Calculations

In calculating eligible basis for the purposes of determining federal tax credits, we have not included the 130 percent basis boost for sites located in Qualified Census Tracts (QCTs) and Difficult to Develop Areas (DDAs), as there currently are no QCTs in Chapel Hill.

4. Income Targeting Scenarios

The leveraged financing alternatives analyzed require specific income targeting for a project to comply with and/or to be competitive under the current QAP for North Carolina. Subsidy requirements were estimated for each of the rental housing prototypes assuming income targeting at 60% of AMI for the “no leverage” and 4 percent tax credit scenarios; and a combination of 30% AMI, 40% AMI and 50% AMI units for the 9% tax credit scenario, based on DRA’s review of the QAP. Subsidy requirements may be higher for individual projects, depending upon factors such as income targeting, the tenant population and need for services, as well as specific project land and development costs.

5. Rental Housing Gaps with and without Tax Credits

Table 9 compares the estimated affordability gaps for the renter prototypes without tax credits and with leveraged financing from 9 percent Low Income Housing Tax Credits (tax credits) or the use of 4 percent tax credits and tax-exempt bonds, to demonstrate the economic value of these leveraged financing sources. The project sites were not scored for competitiveness for 9% tax credits according to the QAP site scoring criteria, but given the more rural location of the Greene Tract it is highly unlikely that site would be competitive.

Table 9
Summary of Per Unit Subsidy Requirements¹
Renter Housing Prototypes with and without Tax Credits
Town of Chapel Hill
2016

Prototype	No Tax Credits (Unleveraged)	4% Tax Credits with Tax-Exempt Bonds	9% Tax Credits
1. Ephesus Fordham ²	\$147,600	\$78,800	\$5,200 ^{5,6}
2a. Craig-Gomains Rental ^{3,4}	\$75,000	\$33,700	\$0
3. Legion Road ²	\$105,900	50,900 ⁵	\$6,000 ⁵
4a. Greene Tract Rental ³	\$76,000	\$28,600	\$0

¹Represents weighted average per unit gap across all unit sizes.

²Development cost includes market land cost/value estimated at \$25,000 per unit.

³Development cost includes no land cost for these publicly-owned parcels.

⁴Gap is after tax increment loan and proceeds from potential sale of owner parcel for no tax credit and 4% tax credit scenarios. Sale proceeds from the owner parcel are not needed to eliminate the gap for 9% tax credit scenario.

⁵Projects exceed project size limits for the Central Region of 80 units for 9% tax credits and 200 units for tax-exempt bond projects and would have to be phased, reduced in size, or split between market-rate and affordable developments meeting size limits for financing purposes.

⁶Hard construction costs may exceed development cost limits, earning negative points for 9% credits.

Source: DRA.

2. Tax Increment Financing

As a financing tool for affordable housing development, tax increment financing (TIF) is most valuable in situations where development occurs on vacant parcels with low base-year taxes or on tax-exempt, publicly-owned, properties that will be entering the property tax rolls by virtue of new private development. In addition,

since State law authorizes full or partial property tax abatements for affordable rental developments, TIFs on stand-alone rental housing developments will also have greater value if the affordable housing development is part of a larger mixed-income or mixed-use development. Market-rate components of such a project generate incremental tax revenues that can be used to subsidize affordable developments.

DRA estimated the financial benefit of using synthetic tax increment financing approach on mixed income projects (that include both market and affordable units) to generate funds to help close the gap on the affordable units. Under this approach, all or a portion of the increase in taxes generated by new market-rate development is pledged back to the developer to help close the financing gap on the affordable units. This approach is of particular value on sites that are currently generating no or very low taxes, such as publicly owned sites.

The potential benefit of tax increment financing was estimated for Prototype #2, Craig Gomains. Since public housing sites in the City currently do not generate property tax revenues, any property tax revenues generated by new market rate development on a portion the site would represent new increment. As a development incentive, this tax increment may be pledged back to the developer to help close the gap on the new affordable rental replacement units for the existing public housing on the site. Public housing sites would not be sold but would be on a long-term ground lease providing the same economic benefit to the owner on which property taxes would be assessed.

DRA's projections of tax increment revenues and the supportable debt that could be financed from the flow of increment are shown for the Craig-Gomains prototype in **Table 10**. Financing assumptions used in estimating the capital that might be raised include a 5.0% interest rate, 1.20 debt coverage ratio and 20-year term.

3. HUD Rental Assistance Demonstration Program (RAD)

As described in more detail in the New Revenue Sources report prepared as part of this study, the Rental Assistance Demonstration Program (RAD) offered by HUD provides a valuable source of leveraged financing for public housing. The Town of Chapel Hill's potential participation in RAD will require Congressional approval to raise the statutory cap on the program, but DRA believes there is a high probability of this occurring and that Chapel Hill should proceed with the analysis and planning necessary to complete a RAD application.

Table 10
Projected Tax Increment Revenues and Supportable Debt
Prototype 2: Craig-Gomains Rental
Chapel Hill Affordability Gap and Economic Analysis

	Prototype 2 Craig-Gomains
	Owner TH
ASSUMPTIONS	
<i>Total Residential Units</i>	40
<i>Average Unit Size (Net SF)</i>	1,210
<i>Residential Net SF (Living Area)</i>	48,400
<i>Total Net SF</i>	48,400
<i>Total Gross SF Building Area (Excluding Parking)</i>	64,533
<i>Structured Parking Spaces</i>	0
<i>Surface Parking Spaces</i>	43
<i>Total Parking Spaces</i>	43
<i>Site Area (SF)</i>	182,952
<i>Approximate Building Stories</i>	2
Estimated Market Value of New Development	
Total Net Sales Proceeds, Owner Housing	\$8,736,200
Net Operating Income, Rental Housing	\$0
Cap Rate, Rental Housing (Low Scenario)	5.9%
Total Market Value	\$8,736,200
<i>Market Value per SF Site Area</i>	\$47.75
Less: Existing Assessed Value	\$0
Increase in Assessed Value	\$8,736,200
Projected Annual Tax Increment to Town of Chapel Hill	\$45,778
@ Tax Rate: 0.524%	
Supportable Debt @ Interest Rate: 5.0%	\$481,700
DCR 1.2	
Term (Years) 20	

Source: DRA

The RAD application will require the Town to prepare, among other things, a pro forma financial analysis to demonstrate the financial feasibility of RAD conversion for individual projects and/or the Town's entire public housing portfolio. To help the Town assess the feasibility of RAD conversion, DRA has prepared a financial analysis of potential redevelopment of the Craig-Gomains public housing project with a prototypical new development incorporating both affordable rental (public housing replacement) and market-rate owner housing. The strategy is to use funds generated by the market-rate owner housing to help fund the new affordable rental units.

The rental income assumptions for the Craig-Gomains rental prototype for the no leverage, 9% tax credit and 4% tax credit/bond scenarios are shown in **Table 11**. DRA estimated rental income for the Craig-Gomains new rental units based on estimated RAD rents from HUD for 2014. Operating costs are based on the operating cost assumptions described above, rather than actual costs experienced for existing public housing projects by the Town. New rental units should be substantially more efficient to operate, and the Town may choose to use a nonprofit or other organization to operate the units rather than operate them itself.

The estimated sources and uses for the Craig-Gomains rental prototype are summarized in **Table 12** by scenario. In addition to the supportable mortgage supportable from RAD rents, additional potential sources of gap financing include tax increment generated by market rate development on the owner parcel, as well as sale or capitalized ground lease proceeds resulting from sale or lease of the owner parcel to a market-rate developer for development as market-rate owner housing. Sale proceeds from the owner parcel are not necessary to eliminate the affordability gap in the 9% tax credit scenario.

Table 11
Leveraged Financing Analysis: Rents and Affordable Mortgage
Prototype 2
Craig-Gomains
Chapel Hill Affordability Gap and Economic Analysis

	Projections			Assumptions		
	No Tax Credits	4% Tax Credits, Tax Exempt Bonds	9% Tax Credits	No Tax Credits	4% Tax Credits, Tax Exempt Bonds	9% Tax Credits
Number of Units by Income Level				Percent of Units by Income Level and Unit Bedroom Count		
30% AMI				30% AMI	30% AMI	30% AMI
One Bedroom	0	0	0	0%	0%	0%
Two Bedroom	0	0	0	0%	0%	0%
Three Bedroom	0	0	0	0%	0%	0%
40% AMI				40% AMI	40% AMI	40% AMI
One Bedroom	0	0	0	0%	0%	0%
Two Bedroom	0	0	0	0%	0%	0%
Three Bedroom	0	0	0	0%	0%	0%
50% AMI				50% AMI	50% AMI	50% AMI
One Bedroom	0	0	0	0%	0%	0%
Two Bedroom	0	0	0	0%	0%	0%
Three Bedroom	0	0	0	0%	0%	0%
60% AMI				60% AMI	60% AMI	60% AMI
One Bedroom	0	0	0	0%	0%	0%
Two Bedroom	0	0	0	0%	0%	0%
Three Bedroom	0	0	0	0%	0%	0%
RAD Rents				RAD	RAD	RAD
One Bedroom	15	15	15	100%	100%	100%
Two Bedroom	30	30	30	100%	100%	100%
Three Bedroom	15	15	15	100%	100%	100%
Monthly Gross Rents				Monthly Rent by Income Level and Bedroom Count		
30% AMI				30% AMI	Tax Credit Rents	
One Bedroom	\$0	\$0	\$0	One Bedroom	\$322	
Two Bedroom	\$0	\$0	\$0	Two Bedroom	\$384	
Three Bedroom	\$0	\$0	\$0	Three Bedroom	\$439	
40% AMI				40% AMI		
One Bedroom	\$0	\$0	\$0	One Bedroom	\$454	
Two Bedroom	\$0	\$0	\$0	Two Bedroom	\$543	
Three Bedroom	\$0	\$0	\$0	Three Bedroom	\$623	
50% AMI				50% AMI		
One Bedroom	\$0	\$0	\$0	One Bedroom	\$587	
Two Bedroom	\$0	\$0	\$0	Two Bedroom	\$702	
Three Bedroom	\$0	\$0	\$0	Three Bedroom	\$807	
60% AMI				60% AMI		
One Bedroom	\$0	\$0	\$0	One Bedroom	\$713	
Two Bedroom	\$0	\$0	\$0	Two Bedroom	\$854	
Three Bedroom	\$0	\$0	\$0	Three Bedroom	\$988	
Estimated RAD Rents				Estimated RAD Rents		
One Bedroom	\$6,660	\$6,660	\$6,660	One Bedroom	\$444	
Two Bedroom	\$15,780	\$15,780	\$15,780	Two Bedroom	\$526	
Three Bedroom	\$10,185	\$10,185	\$10,185	Three Bedroom	\$679	
Gross Rents	\$391,500	\$391,500	\$391,500	Total Number of Units: 60		
Less: Vacancy	(\$27,405)	(\$27,405)	(\$27,405)			
Less: Operating Costs	(\$288,000)	(\$288,000)	(\$288,000)	One Bedroom	Two Bedroom	Three Bedroom
Less: Replacement Reserves	(\$15,000)	(\$15,000)	(\$15,000)	15	30	15
Net Operating Income	\$61,095	\$61,095	\$61,095			
Annual Debt Service	\$50,913	\$50,913	\$53,126			
Permanent Mortgage Amount	\$707,648	\$790,339	\$738,415			
Vacancy Rate (1)	7.00%	7.00%	7.00%			
Annual Operating Cost Per Unit	\$4,800	\$4,800	\$4,800			
Annual Replace. Reserve/Unit (1)	\$250	\$250	\$250			
Mortgage Interest Rate	6.00%	5.00%	6.00%			
Debt Coverage Ratio	1.20	1.20	1.15			
Term (Years)	30	30	30			

(1) Minimum vacancy rate of 7.0% and minimum annual replacement reserves of \$250 per unit for new construction 9% tax credit projects from 2016 QAP for North Carolina.

Source: DRA

Table 12
Leveraged Financing Analysis: Sources and Uses
Prototype 2
Craig-Gomains
Chapel Hill Affordability Gap and Economic Analysis

	4% Tax Credits, Tax			Assumptions	
	No Tax Credits	Exempt Bonds	9% Tax Credits		
SOURCES AND USES					
PERMANENT SOURCES OF FUNDS					
Federal Tax Credit Equity (1)	\$0	\$2,498,733	\$6,267,751	Total Units	60
Permanent Mortgage	\$707,648	\$790,339	\$738,415	Acres	2.80
Tax Increment Loan/Bond (2)	\$481,700	\$481,700	\$481,700	Unit/Acre	21.43
Sale/Lease of Owner Parcel (3)	\$1,601,000	\$1,601,000	\$0		
Gap Financing Required	\$4,499,519	\$2,020,679	\$0		
TOTAL SOURCES	\$7,289,867	\$7,392,450	\$7,487,867		
Permanent Gap Financing/Unit	\$74,992	\$33,678	\$0		
PERMANENT USES OF FUNDS					
Land Acquisition Costs	\$0	\$0	\$0	Difference in Per Unit Cost Comared to "No Tax Credit" Scenario	
Direct Construction Costs	\$5,730,000	\$5,730,000	\$5,730,000		
Permits and Fees	\$180,000	\$180,000	\$180,000	4% Tax Credits	9% Tax Credits
Soft Costs	\$439,600	\$475,600	\$493,600	\$0	\$0
Financing Costs/Savings	\$276,643	\$222,643	\$276,643	\$600	\$900
Capitalized Operating Reserve (4)	\$0	\$120,583	\$144,000	(\$900)	\$0
Developer Fee/Profit (5)	\$663,624	\$663,624	\$663,624	\$0	\$0
TOTAL COST	\$7,289,867	\$7,392,450	\$7,487,867		
Total Cost Per Unit	\$121,498	\$123,208	\$124,798	(\$300)	\$900
Assumptions and Calculations					
Tax Credit Basis					
Land Acquisition Costs	N/A	\$0	\$0	% of Cost in Basis (Excluding Land)	
Direct Construction Costs	N/A	\$5,730,000	\$5,730,000	0%	0%
Permits and Fees	N/A	\$180,000	\$180,000	100%	100%
Soft Costs	N/A	\$380,480	\$222,120	100%	100%
Financing Costs	N/A	\$122,453	\$207,482	80%	45%
Developer Overhead and Profit	N/A	\$663,624	\$663,624	55%	75%
Total Undadjusted Tax Credit Basis	N/A	\$7,076,558	\$7,003,226	100%	100%
Basis Boost (%) (6)	N/A	100%	100%	96%	94%
Total Adjusted Tax Credit Basis	N/A	\$7,076,558	\$7,003,226		
Tax Credit Rate (Per NCHFA) (7)	N/A	3.21%	9.00%		
Annual Tax Credits (8)	N/A	\$227,158	\$630,290		
Tax Credit Pricing	N/A	\$1.10	\$1.05		
Maximum Federal Tax Credit Equity (9)		\$2,498,733	\$6,618,049		

N/A = not applicable.

- (1) Minimum of maximum tax credit equity or amount needed for feasibility.
- (2) Estimated loan or bond serviced by the property tax increment generated by new market-rate development on the owner site.
- (3) Estimated proceeds from capitalized ground lease or sale of market-rate owner parcel based on estimated market value of \$40,000 per unit.
- (4) NCHFA requires a capitalized operating reserve equal to 6 months debt service and operating expenses for 9% tax credit projects and 4 months for bond projects.
- (5) Maximum developer fee permitted by the NCHFA is \$13,000 per unit for new construction projects, up to a maximum of \$1.3 million for 9% tax credit projects and \$1.9 million for bond projects.
- (6) Projects located in a Qualified Census Tract (QCT) or Difficult to Develop Area (DDA) are eligible for a 30% basis boost.
- (7) 2016 tax credit factors from the North Carolina Housing Finance Agency.
- (8) Adjusted tax credit basis multiplied by tax credit rate.
- (9) Equals annual tax credits multiplied by tax credit pricing multiplied by 10 years.

Source: DRA

4. Density Bonus

DRA estimated the value of a potential density bonus by comparing the financial performance of a market-rate rental prototype at the “baseline” density to the performance of mixed-income prototype with a density bonus. The analysis estimates the percentage of affordable units that could be economically supported by the value of the density bonus. This analysis was conducted for the Ephesus Fordham prototype (Prototype 1) and the Legion Road prototype (Prototype 3).

The density bonus analysis uses a return on equity (ROE) and residual land value (RLV) analysis of each “baseline” prototype and the adjusted prototype with the density bonus. The findings of the ROE analysis are summarized in **Table 13**. The detailed analysis tables are described in the next section.

The calculated ROE for each prototype is compared to a threshold rate of return on equity, estimated at 8% to 10%, to determine if it is feasible. For the residual land value analysis, the resulting RLV is compared to the assumed or estimated land value. If the RLV is near or above the assumed land value, the prototype is feasible. If the RLV is way below assumed land value or is negative, the prototype is not feasible.

Looking at the results of the density bonus analysis, Prototype 1 is not feasible in the baseline case, generating negative ROE and RLV financial measures. Therefore, adding the density bonus does not improve the performance.

For Prototype 3, we see a ROE in excess of the threshold in the baseline case. Adding the density bonus improves financial feasibility. The analysis compares the ROE under the baseline case with the density bonus prototype under several scenarios including a percentage of affordable units as follows:

Scenario 1: 5% of units at 30% of AMI

Scenario 2: 5% of units at 50% of AMI

Scenario 3: 10% of units at 50% AMI

Scenario 4: 15% of units at 50% AMI

The ROE with the density bonus is slightly less than the ROE of the baseline prototype under Scenario 2, indicating that the bonus provides economic value to support a threshold of approximately 5% of units at 50% of AMI. The ROE falls further below the baseline for the other scenarios.

Table 13
Summary of Return on Equity and Land Residual Analysis Results
Selected Prototypes
Chapel Hill Affordability Gap and Economic Analysis

Resid. Cap Rate 5.90%

	Prototype 1 Ephesus Fordham	Prototype 1 w/ Density Bonus	Prototype 3 Legion Road	Prototype 3 w/ Density Bonus
<i>Tenure</i>	<i>Rental</i>	<i>Rental</i>	<i>Rental</i>	<i>Rental</i>
<i>Product Type</i>	<i>Stacked Flat Apts.</i>	<i>Stacked Flat Apts.</i>	<i>Stacked Flat Apts.</i>	<i>Stacked Flat Apts.</i>
<i>Residential Units</i>	136	170	575	719
<i>Site Area (SF)</i>	148,104	148,104	1,568,160	1,568,160
<i>Residential Net SF</i>	110,600	138,350	502,900	628,900
<i>Total Net SF</i>	110,600	138,350	502,900	628,900
<i>Residential Units</i>	136	170	575	719
<i>Parking Spaces</i>	0	0	-	0
<i>Approximate Building Stories</i>	5	6	4	4
Assumed Land Price				
Per Unit	\$25,000	\$20,000	\$25,000	\$20,000
Per SF	\$22.96	\$22.96	\$9.17	\$9.17
Number of Inclusionary Units				
100% Market Rate	0	0	0	0
Scenario 1 (1)	0	8	0	36
Scenario 2 (2)	0	8	0	36
Scenario 3 (3)	0	8	0	36
Scenario 4 (4)	0	18	0	72
Return on Equity (ROE) (5)				
100% Market Rate	-20%	-16%	25%	27%
Scenario 1 (1)		-22%		19%
Scenario 2 (2)		-20%		21%
Scenario 3 (3)		-19%		22%
Scenario 4 (4)		-25%		16%
Residual Land Value (RLV) (6)				
100% Market Rate				
Per Unit	(\$15,804)	\$64,779	\$48,725	\$47,831
Per SF	(\$15)	\$32	\$18	\$22
Scenario 1 (1)				
Per Unit		\$211,804		\$36,423
Per SF		\$104		\$17
Scenario 2 (2)				
Per Unit		\$211,804		\$39,557
Per SF		\$104		\$18
Scenario 3 (3)				
Per Unit		\$211,804		\$40,685
Per SF		\$104		\$19
Scenario 4 (4)				
Per Unit		\$211,804		\$33,031
Per SF		\$104		\$15
Assumed Return on Equity (7)	8%	8%	8%	8%
Assumed Investment Period (Years)	3	1	3	3

- (1) 5% of total units at 30% of AMI for renters.
- (2) 5% of total units at 50% of AMI for renters.
- (3) 10% of total units at 50% of AMI for renters.
- (4) 15% of units at 50% of AMI for renters.
- (5) Return on equity measured as net project value divided by the number of years equity investment divided by total value.
- (6) Land residual value per housing unit and per square foot site area.
- (7) Used in land residual analysis.

Source: DRA.

H. Detailed Calculations and Data Tables

Calculations of affordable rents and the per unit supportable mortgage by income level and unit bedroom count are shown in **Table 14**. Calculations of affordable home prices are shown in **Table 15**.

Affordability gaps for the owner prototypes are calculated in **Table 16**.

Leveraged financial analysis of the rental prototypes are summarized in **Table 17** and **Table 18** for Prototype 1 (Ephesus Fordham), in **Table 19** and **Table 20** for Prototype 3 (Legion Road), and in **Table 21** and **Table 22** for Prototype 4 (Greene Tract rental site).

The return on equity and land residual analyses used to analyze the value of the density bonus are shown in **Table 23** through **Table 29**.

Table 14
Supportable Mortgage Calculations, Affordable Rental Housing
Chapel Hill Affordability Gap and Economic Analysis

Assumptions

HUD Median Household Income (1)					\$70,700
Affordable Housing Expense As a % of Income (2)					30%
No. of Bedrooms	Studio	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom
Household Size	1.0 Persons	1.5 Persons	3.0 Persons	4.5 Persons	6.0 Persons
Household Size Income Adjust. Factor	70%	75%	90%	104%	116%
Renter Utility Allowance (3)	\$66	\$76	\$93	\$112	\$130
Miscellaneous Income Per Unit Per Year	\$100				
Vacancy Rate	3.00%				
Operating Cost Per Unit Per Year	\$4,400 (Assumes property tax exemption)				
Mortgage Interest Rate	6.50%				
Mortgage Amortization (Years)	30				

Per Unit Supportable Mortgage By Income Level

	Studio	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom
<u>30% of Median</u>					
Annual Income Limit	\$14,847	\$15,908	\$19,089	\$22,058	\$24,604
Affordable Monthly Housing Expense	\$371	\$398	\$477	\$551	\$615
Less: Monthly Utility Allowance	(\$66)	(\$76)	(\$93)	(\$112)	(\$130)
Affordable Monthly Rent	\$305	\$322	\$384	\$439	\$485
Annual Gross Rental Income Per Unit	\$3,660	\$3,864	\$4,608	\$5,268	\$5,820
Plus: Miscellaneous Income	\$100	\$100	\$100	\$100	\$100
Less: Vacancy	(\$110)	(\$116)	(\$138)	(\$158)	(\$175)
Less: Annual Unit Operating Costs	(\$4,400)	(\$4,400)	(\$4,400)	(\$4,400)	(\$4,400)
Net Operating Income Per Unit	(\$750)	(\$552)	\$170	\$810	\$1,345
Available for Debt Service	(\$750)	(\$552)	\$170	\$810	\$1,345
Supportable Mortgage Per Unit	(\$9,900)	(\$7,300)	\$2,200	\$10,700	\$17,700

<u>40% of Median</u>					
Annual Income Limit	\$19,796	\$21,210	\$25,452	\$29,411	\$32,805
Affordable Monthly Housing Expense	\$495	\$530	\$636	\$735	\$820
Less: Monthly Utility Allowance	(\$66)	(\$76)	(\$93)	(\$112)	(\$130)
Affordable Monthly Rent	\$429	\$454	\$543	\$623	\$690
Annual Gross Rental Income Per Unit	\$5,148	\$5,448	\$6,516	\$7,476	\$8,280
Plus: Miscellaneous Income	\$100	\$100	\$100	\$100	\$100
Less: Vacancy	(\$154)	(\$163)	(\$195)	(\$224)	(\$248)
Less: Annual Unit Operating Costs	(\$4,400)	(\$4,400)	(\$4,400)	(\$4,400)	(\$4,400)
Net Operating Income Per Unit	\$694	\$985	\$2,021	\$2,952	\$3,732
Available for Debt Service	\$694	\$985	\$2,021	\$2,952	\$3,732
Supportable Mortgage Per Unit	\$9,100	\$13,000	\$26,600	\$38,900	\$49,200

<u>50% of Median</u>					
Annual Income Limit	\$24,745	\$26,513	\$31,815	\$36,764	\$41,006
Affordable Monthly Housing Expense	\$619	\$663	\$795	\$919	\$1,025
Less: Monthly Utility Allowance	(\$66)	(\$76)	(\$93)	(\$112)	(\$130)
Affordable Monthly Rent	\$553	\$587	\$702	\$807	\$895
Annual Gross Rental Income Per Unit	\$6,636	\$7,044	\$8,424	\$9,684	\$10,740
Plus: Miscellaneous Income	\$100	\$100	\$100	\$100	\$100
Less: Vacancy	(\$199)	(\$211)	(\$253)	(\$291)	(\$322)
Less: Annual Unit Operating Costs	(\$4,400)	(\$4,400)	(\$4,400)	(\$4,400)	(\$4,400)
Net Operating Income Per Unit	\$2,137	\$2,533	\$3,871	\$5,093	\$6,118
Available for Debt Service	\$2,137	\$2,533	\$3,871	\$5,093	\$6,118
Supportable Mortgage Per Unit	\$28,200	\$33,400	\$51,000	\$67,200	\$80,700

<u>60% of AMI</u>					
Annual Income Limit	\$29,694	\$31,815	\$38,178	\$44,117	\$49,207
Affordable Monthly Housing Expense	\$742	\$795	\$954	\$1,103	\$1,230
Less: Monthly Utility Allowance	(\$66)	(\$76)	(\$93)	(\$112)	(\$130)
Affordable Monthly Rent	\$676	\$719	\$861	\$991	\$1,100
Annual Gross Rental Income Per Unit	\$8,112	\$8,628	\$10,332	\$11,892	\$13,200
Plus: Miscellaneous Income	\$100	\$100	\$100	\$100	\$100
Less: Vacancy	(\$243)	(\$259)	(\$310)	(\$357)	(\$396)
Less: Annual Unit Operating Costs	(\$4,400)	(\$4,400)	(\$4,400)	(\$4,400)	(\$4,400)
Net Operating Income Per Unit	\$3,569	\$4,069	\$5,722	\$7,235	\$8,504
Available for Debt Service	\$3,569	\$4,069	\$5,722	\$7,235	\$8,504
Supportable Mortgage Per Unit	\$47,000	\$53,600	\$75,400	\$95,400	\$112,100

<u>80% of Median</u>					
Annual Income Limit	\$39,592	\$42,420	\$50,904	\$58,822	\$65,610
Affordable Monthly Housing Cost	\$990	\$1,061	\$1,273	\$1,471	\$1,640
Less: Monthly Utility Allowance	(\$66)	(\$76)	(\$93)	(\$112)	(\$130)
Affordable Monthly Rent	\$924	\$985	\$1,180	\$1,359	\$1,510
Annual Gross Rental Income Per Unit	\$11,088	\$11,820	\$14,160	\$16,308	\$18,120
Less: Vacancy	(\$333)	(\$355)	(\$425)	(\$489)	(\$544)
Less: Annual Unit Operating Costs	(\$4,400)	(\$4,400)	(\$4,400)	(\$4,400)	(\$4,400)
Net Operating Income Per Unit	\$6,355	\$7,065	\$9,335	\$11,419	\$13,176
Supportable Mortgage Per Unit	\$83,800	\$93,200	\$123,100	\$150,500	\$173,700

Summary of Affordable Rents	Studio	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom
30% of Median	\$305	\$322	\$384	\$439	\$485
40% of Median	\$429	\$454	\$543	\$623	\$690
50% of Median	\$553	\$587	\$702	\$807	\$895
60% of Median	\$676	\$719	\$861	\$991	\$1,100
80% of Median	\$924	\$985	\$1,180	\$1,359	\$1,510

(1) HUD Area Median Income (AMI) for the Durham-Chapel Hill HMFA in 2016 is \$74,900. However, very low and low income limits for the HMFA are effectively based on a median income of \$70,700 so this is the figure used to calculate 60%, 100%, and 120% of AMI income limits.
(2) Includes 30% for rent plus utilities.
(3) Source: Durham Housing Authority, effective January 2015.

Source: DRA

Table 15
Affordable Home Sales Price Calculations, Owner Housing
Chapel Hill Affordability Gap and Economic Analysis

Assumptions

HUD Median Household Income (1)					\$70,700	
Affordable Mortgage Principal and Interest as a % of Income					30%	
No. of Bedrooms		Studio	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom
Household Size		1 Persons	2 Persons	3 Persons	4 Persons	8 Persons
Household Size Income Adjust. Factor		70%	80%	90%	100%	132%
Monthly HOA and Stewardship Fees	\$200					
Monthly Property Insurance	\$45					
Property Tax Rate	1.61%					
Mortgage Interest Rate	5.00%					
Term (Years)	30					
Downpayment (% of Sales Price)	5.00%					

Per Unit Affordable Sales Price by Unit Bedroom Count

		Studio	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom
80% AMI						
Annual Income Limit		\$39,592	\$45,248	\$50,904	\$56,560	\$74,659
Affordable Monthly Housing Expense		\$990	\$1,131	\$1,273	\$1,414	\$1,866
Less: HOA/Maintenance Expense		(\$200)	\$200	\$200	\$200	(\$200)
Less: Property Insurance		(\$45)	(\$45)	(\$45)	(\$45)	(\$45)
Available for Principal, Interest, Taxes		\$745	\$1,286	\$1,428	\$1,569	\$1,621
Less: Property Taxes	1.61%	\$196	\$338	\$376	\$413	\$427
Supportable Mortgage		\$138,780	\$239,558	\$266,010	\$292,276	\$301,963
Assumed Assessed Value at Sale	95.00%	\$146,084	\$252,166	\$280,011	\$307,659	\$317,855
Available for Mortg. Principal and Interest		\$549	\$948	\$1,052	\$1,156	\$1,194
Supportable Mortgage		\$102,260	\$176,519	\$196,010	\$215,364	\$222,502
Plus: Downpayment @	5.00%	\$5,380	\$9,290	\$10,315	\$11,335	\$11,710
Affordable Sales Price (Rounded)		\$107,600	\$185,800	\$206,300	\$226,700	\$234,200
100% AMI						
Annual Income Limit		\$49,490	\$56,560	\$63,630	\$70,700	\$93,324
Affordable Monthly Housing Expense		\$1,237	\$1,414	\$1,591	\$1,768	\$2,333
Less: HOA/Maintenance Expense		(\$200)	\$200	\$200	\$200	\$0
Less: Property Insurance		(\$45)	(\$45)	(\$45)	(\$45)	(\$45)
Available for Principal, Interest, Taxes		\$992	\$1,569	\$1,746	\$1,923	\$2,288
Less: Property Taxes	1.61%	\$261	\$413	\$459	\$506	\$602
Supportable Mortgage		\$184,791	\$292,276	\$325,248	\$358,220	\$426,212
Assumed Assessed Value at Sale	95.00%	\$194,517	\$307,659	\$342,366	\$377,073	\$448,645
Available for Mortg. Principal and Interest		\$731	\$1,156	\$1,287	\$1,417	\$1,686
Supportable Mortgage		\$136,164	\$215,364	\$239,660	\$263,955	\$314,056
Plus: Downpayment @	5.00%	\$7,165	\$11,335	\$12,615	\$13,890	\$16,530
Affordable Sales Price (Rounded)		\$143,300	\$226,700	\$252,300	\$277,800	\$330,600
120% AMI						
Annual Gross Income		\$59,388	\$67,872	\$76,356	\$84,840	\$111,989
Affordable Monthly Housing Expense		\$1,485	\$1,697	\$1,909	\$2,121	\$2,800
Less: HOA/Maintenance Expense		(\$200)	\$200	\$200	\$200	(\$200)
Less: Property Insurance		(\$45)	(\$45)	(\$45)	(\$45)	(\$45)
Available for Principal, Interest, Taxes		\$1,240	\$1,852	\$2,064	\$2,276	\$2,555
Less: Property Taxes	1.61%	\$326	\$487	\$543	\$599	\$672
Supportable Mortgage		\$230,989	\$344,994	\$384,485	\$423,977	\$475,950
Assumed Assessed Value at Sale	95.00%	\$243,147	\$363,151	\$404,721	\$446,292	\$501,000
Available for Mortg. Principal and Interest		\$914	\$1,365	\$1,521	\$1,677	\$1,883
Supportable Mortgage		\$170,205	\$254,209	\$283,309	\$312,409	\$350,705
Plus: Downpayment @	5.00%	\$8,960	\$13,380	\$14,910	\$16,445	\$18,460
Affordable Sales Price (Rounded)		\$179,200	\$267,600	\$298,200	\$328,900	\$369,200

(1) HUD Area Median Income (AMI) for the Durham-Chapel Hill HMFA in 2016 is \$74,900. However, very low and low income limits for the HMFA are effectively based on a median income of \$70,700 so this is the figure used to calculate 60%, 100%, Source: DRA

Table 16
Owner Affordability Gap Calculations
Owner Prototypes
Chapel Hill Affordability Gap and Economic Analysis

	Prototype 4	Prototype 5	
	Greene Tract	Sunrise	
Product Type	TH	SFD	TH
Tenure	Owner	Owner	Owner
Total Housing Units	60	50	30
Total Gross Square Feet, Incl. Parking	103,714	92,000	34,200
Net Rentable SF of Residential Space	72,600	67,800	54,300
Approximate Building Stories	2	2	2
Unit Size (Square Feet)			
Studio/Loft	-	-	-
One Bedroom	-	-	-
Two Bedroom	1,000	1,700	1,000
Three Bedroom	1,300	1,900	1,200
<i>Average</i>	1,210	1,840	1,140
TDC Per Net Square Foot	\$199.00	\$162.00	\$87.00
TDC Per Unit			
Two Bedroom	\$199,000	\$275,400	\$87,000
Three Bedroom	\$258,700	\$307,800	\$104,400
<i>Average</i>	\$240,790	\$298,080	\$99,180
Affordable Sales Price Per Unit By Income Level			
50% of AMI			
Two Bedroom	\$79,500	\$79,500	\$79,500
Three Bedroom	\$92,300	\$92,300	\$92,300
80% of AMI			
Two Bedroom	\$148,500	\$148,500	\$148,500
Three Bedroom	\$168,900	\$168,900	\$168,900
100% of AMI			
Two Bedroom	\$194,500	\$194,500	\$194,500
Three Bedroom	\$220,100	\$220,100	\$220,100
120% of AMI			
Two Bedroom	\$240,400	\$240,400	\$240,400
Three Bedroom	\$271,100	\$271,100	\$271,100
Affordability Gap by Unit Size and Income Level			
50% of AMI			
Two Bedroom	\$119,500	\$195,900	\$7,500
Three Bedroom	\$166,400	\$215,500	\$12,100
80% of AMI			
Two Bedroom	\$50,500	\$126,900	(\$61,500)
Three Bedroom	\$89,800	\$138,900	(\$64,500)
100% of AMI			
Two Bedroom	\$4,500	\$80,900	(\$107,500)
Three Bedroom	\$38,600	\$87,700	(\$115,700)
120% of AMI			
Two Bedroom	(\$41,400)	\$35,000	(\$153,400)
Three Bedroom	(\$12,400)	\$36,700	(\$166,700)

Source: DRA

Table 17
Leveraged Financing Analysis: Rents and Affordable Mortgage
Prototype 1
Ephesus Fordham
Chapel Hill Affordability Gap and Economic Analysis

	Projections			Assumptions		
	No Tax Credits	4% Tax Credits, Tax Exempt Bonds	9% Tax Credits	No Tax Credits	4% Tax Credits, Tax Exempt Bonds	9% Tax Credits
Number of Units by Income Level				Percent of Units by Income Level and Unit Bedroom Count		
30% AMI				30% AMI	30% AMI	30% AMI
One Bedroom	0	0	10	0%	0%	20%
Two Bedroom	0	0	14	0%	0%	20%
Three Bedroom	0	0	4	0%	0%	20%
40% AMI				40% AMI	40% AMI	40% AMI
One Bedroom	0	0	0	0%	0%	0%
Two Bedroom	0	0	0	0%	0%	0%
Three Bedroom	0	0	0	0%	0%	0%
50% AMI				50% AMI	50% AMI	50% AMI
One Bedroom	0	0	10	0%	0%	20%
Two Bedroom	0	0	14	0%	0%	20%
Three Bedroom	0	0	4	0%	0%	20%
60% AMI				60% AMI	60% AMI	60% AMI
One Bedroom	48	48	28	100%	100%	60%
Two Bedroom	68	68	40	100%	100%	60%
Three Bedroom	20	20	12	100%	100%	60%
Total Monthly Gross Rents				Monthly Rent by Income Level and Bedroom Count		
30% AMI				30% AMI	Per Unit	Total Project
One Bedroom	\$0	\$0	\$3,220	One Bedroom	\$322	
Two Bedroom	\$0	\$0	\$5,376	Two Bedroom	\$384	
Three Bedroom	\$0	\$0	\$1,756	Three Bedroom	\$439	
40% AMI				40% AMI		
One Bedroom	\$0	\$0	\$0	One Bedroom	\$454	
Two Bedroom	\$0	\$0	\$0	Two Bedroom	\$543	
Three Bedroom	\$0	\$0	\$0	Three Bedroom	\$623	
50% AMI				50% AMI		
One Bedroom	\$0	\$0	\$5,870	One Bedroom	\$587	
Two Bedroom	\$0	\$0	\$9,828	Two Bedroom	\$702	
Three Bedroom	\$0	\$0	\$3,228	Three Bedroom	\$807	
60% AMI				60% AMI		
One Bedroom	\$34,224	\$34,224	\$19,964	One Bedroom	\$713	
Two Bedroom	\$58,072	\$58,072	\$34,160	Two Bedroom	\$854	
Three Bedroom	\$19,760	\$19,760	\$11,856	Three Bedroom	\$988	
Gross Restricted Rents	\$1,344,672	\$1,344,672	\$1,143,096	Total Number of Units: 136		
Less: Vacancy	(\$94,127)	(\$94,127)	(\$80,017)			
Less: Operating Costs	(\$598,400)	(\$598,400)	(\$598,400)	One Bedroom	Two Bedroom	Three Bedroom
Less: Replacement Reserves	(\$34,000)	(\$34,000)	(\$34,000)	48	68	20
Net Operating Income	\$618,145	\$618,145	\$430,679			
Annual Debt Service	\$515,121	\$515,121	\$374,504			
Permanent Mortgage Amount	\$7,159,819	\$7,996,461	\$5,205,340			
Vacancy Rate (1)	7.00%	7.00%	7.00%			
Annual Operating Cost Per Unit	\$4,400	\$4,400	\$4,400			
Annual Replace. Reserve/Unit (1)	\$250	\$250	\$250			
Mortgage Interest Rate	6.00%	5.00%	6.00%			
Debt Coverage Ratio	1.20	1.20	1.15			
Term (Years)	30	30	30			

(1) Minimum vacancy rate of 7.0% and minimum annual replacement reserves of \$250 per unit for new construction projects from 2016 QAP for North Carolina.

Source: DRA

Table 18
Leveraged Financing Analysis: Sources and Uses
Prototype 1
Ephesus Fordham
Chapel Hill Affordability Gap and Economic Analysis

	4% Tax Credits, Tax			Assumptions	
	No Tax Credits	Exempt Bonds	9% Tax Credits		
SOURCES AND USES					
PERMANENT SOURCES OF FUNDS					
Federal Tax Credit Equity (1)	\$0	\$7,779,174	\$20,267,352	Total Units	136
Permanent Mortgage	\$7,159,819	\$7,996,461	\$5,205,340	Acres	3.40
Deferred Developer Fee (2)	\$0	\$0	\$0	Unit/Acre	40.00
Gap Financing Required	\$20,079,656	\$10,714,725	\$712,867		
TOTAL SOURCES	\$27,239,475	\$26,490,359	\$26,185,559		
Permanent Gap Financing/Unit	\$147,645	\$78,785	\$5,242		
PERMANENT USES OF FUNDS					
Land Acquisition Costs	\$3,400,000	\$3,400,000	\$3,400,000	Difference in Per Unit Cost Comared to "No Tax Credit" Scenario	
Direct Construction Costs	\$17,678,000	\$17,678,000	\$17,678,000		
Permits and Fees	\$408,000	\$408,000	\$408,000	4% Tax Credits	9% Tax Credits
Soft Costs	\$1,506,720	\$1,588,320	\$1,629,120	\$0	\$0
Financing Costs/Savings	\$1,770,439	\$1,648,039	\$1,770,439	\$0	\$0
Capitalized Operating Reserve (3)	\$0	\$0	\$0	(\$900)	\$900
Developer Fee/Profit (4)	\$2,476,316	\$1,768,000	\$1,300,000	\$0	\$0
				(\$5,208)	(\$8,649)
TOTAL COST	\$27,239,475	\$26,490,359	\$26,185,559		
Total Cost Per Unit	\$200,290	\$194,782	\$192,541	(\$5,508)	(\$7,749)
Assumptions and Calculations					
Tax Credit Basis					
Land Acquisition Costs	N/A	\$0	\$0	% of Cost in Basis (Excluding Land)	
Direct Construction Costs	N/A	\$17,678,000	\$17,678,000	0%	0%
Permits and Fees	N/A	\$408,000	\$408,000	100%	100%
Soft Costs	N/A	\$1,270,656	\$733,104	100%	100%
Financing Costs	N/A	\$906,422	\$1,327,830	80%	45%
Developer Overhead and Profit	N/A	\$1,768,000	\$1,300,000	55%	75%
				100%	100%
Total Tax Credit Basis	N/A	\$22,031,078	\$21,446,934		
Basis Boost (%) (5)	N/A	100%	100%	95%	94%
Total Tax Credit Basis with 30% Boost (5)	N/A	\$22,031,078	\$21,446,934		
Tax Credit Rate (Per NCHFA) (6)	N/A	3.21%	9.00%		
Annual Tax Credits (7)	N/A	\$707,198	\$1,930,224		
Tax Credit Pricing	N/A	\$1.10	\$1.05		
Maximum Federal Tax Credit Equity (8)		\$7,779,174	\$20,267,352		

N/A = not applicable.

- (1) Equals annual tax credits multiplied by tax credit pricing multiplied by 10 years.
- (2) DRA did not estimate the deferred developer fees that could be used to reduce or close the gap.
- (3) NCHFA requires a capitalized operating reserve equal to 6 months debt service and operating expenses for 9% tax credit projects and 4 months for bond projects.
- (4) Maximum developer fee permitted by the NCHFA is \$13,000 per unit for new construction projects, up to a maximum of \$1.3 million for 9% tax credit projects and \$1.9 million for bond projects.
- (5) Projects located in a Qualified Census Tract (QCT) or Difficult to Develop Area (DDA) are eligible for a 30% basis boost.
- (6) 2016 tax credit factors from the North Carolina Housing Finance Agency.

Table 19
Leveraged Financing Analysis: Rents and Affordable Mortgage
Prototype 3
Legion Road
Chapel Hill Affordability Gap and Economic Analysis

	Projections			Assumptions		
	No Tax Credits	4% Tax Credits, Tax Exempt Bonds	9% Tax Credits	No Tax Credits	4% Tax Credits, Tax Exempt Bonds	9% Tax Credits
Number of Units by Income Level				Percent of Units by Income Level and Unit Bedroom Count		
30% AMI				30% AMI	30% AMI	30% AMI
One Bedroom	0	0	29	0%	0%	20%
Two Bedroom	0	0	58	0%	0%	20%
Three Bedroom	0	0	29	0%	0%	20%
40% AMI				40% AMI	40% AMI	40% AMI
One Bedroom	0	0	0	0%	0%	0%
Two Bedroom	0	0	0	0%	0%	0%
Three Bedroom	0	0	0	0%	0%	0%
50% AMI				50% AMI	50% AMI	50% AMI
One Bedroom	0	0	29	0%	0%	20%
Two Bedroom	0	0	58	0%	0%	20%
Three Bedroom	0	0	29	0%	0%	20%
60% AMI				60% AMI	60% AMI	60% AMI
One Bedroom	144	144	86	100%	100%	60%
Two Bedroom	288	288	172	100%	100%	60%
Three Bedroom	143	143	85	100%	100%	60%
Monthly Gross Rents				Monthly Rent by Income Level and Bedroom Count		
30% AMI				30% AMI	Per Unit	Total Project
One Bedroom	\$0	\$0	\$9,338	One Bedroom	\$322	
Two Bedroom	\$0	\$0	\$22,272	Two Bedroom	\$384	
Three Bedroom	\$0	\$0	\$12,731	Three Bedroom	\$439	
40% AMI				40% AMI		
One Bedroom	\$0	\$0	\$0	One Bedroom	\$454	
Two Bedroom	\$0	\$0	\$0	Two Bedroom	\$543	
Three Bedroom	\$0	\$0	\$0	Three Bedroom	\$623	
50% AMI				50% AMI		
One Bedroom	\$0	\$0	\$17,023	One Bedroom	\$587	
Two Bedroom	\$0	\$0	\$40,716	Two Bedroom	\$702	
Three Bedroom	\$0	\$0	\$23,403	Three Bedroom	\$807	
60% AMI				60% AMI		
One Bedroom	\$102,672	\$102,672	\$61,318	One Bedroom	\$713	
Two Bedroom	\$245,952	\$245,952	\$146,888	Two Bedroom	\$854	
Three Bedroom	\$141,284	\$141,284	\$83,980	Three Bedroom	\$988	
Gross Restricted Rents	\$5,878,896	\$5,878,896	\$5,012,028	Total Number of Units: 575		
Less: Vacancy	(\$411,523)	(\$411,523)	(\$350,842)			
Less: Operating Costs	(\$2,530,000)	(\$2,530,000)	(\$2,530,000)	One Bedroom	Two Bedroom	Three Bedroom
Less: Replacement Reserves	(\$143,750)	(\$143,750)	(\$143,750)	144	288	143
Net Operating Income	\$2,793,623	\$2,793,623	\$1,987,436			
Annual Debt Service	\$2,328,019	\$2,328,019	\$1,728,205			
Permanent Mortgage Amount	\$32,357,843	\$36,138,935	\$24,020,845			
Vacancy Rate (1)	7.00%	7.00%	7.00%			
Annual Operating Cost Per Unit	\$4,400	\$4,400	\$4,400			
Annual Replace. Reserve/Unit (1)	\$250	\$250	\$250			
Mortgage Interest Rate	6.00%	5.00%	6.00%			
Debt Coverage Ratio	1.20	1.20	1.15			
Term (Years)	30	30	30			

(1) Minimum vacancy rate of 7.0% and minimum annual replacement reserves of \$250 per unit for new construction projects from 2016 QAP for North Carolina.

Source: DRA

Table 20
Leveraged Financing Analysis: Sources and Uses
Prototype 3
Legion Road
Chapel Hill Affordability Gap and Economic Analysis

	4% Tax Credits, Tax			Assumptions																					
	No Tax Credits	Exempt Bonds	9% Tax Credits																						
SOURCES AND USES																									
PERMANENT SOURCES OF FUNDS																									
Federal Tax Credit Equity (1)	\$0	\$23,282,498	\$61,629,133	Total Units	575																				
Permanent Mortgage	\$29,693,810	\$33,163,603	\$21,240,985	Acres	36.00																				
Deferred Developer Fee (2)	\$0	\$0	\$0	Unit/Acre	15.97																				
Gap Financing Required	\$60,871,550	\$29,245,662	\$3,423,630																						
TOTAL SOURCES	\$90,565,360	\$85,691,763	\$86,293,748																						
Permanent Gap Financing/Unit	\$105,864	\$50,862	\$5,954																						
PERMANENT USES OF FUNDS																									
Land Acquisition Costs	\$14,380,000	\$14,380,000	\$14,380,000	Difference in Per Unit Cost Comared to "No Tax Credit" Scenario <table border="1"> <thead> <tr> <th>4% Tax Credits</th> <th>9% Tax Credits</th> </tr> </thead> <tbody> <tr> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>\$600</td> <td>\$900</td> </tr> <tr> <td>(\$900)</td> <td>\$0</td> </tr> <tr> <td>\$0</td> <td>\$0</td> </tr> <tr> <td>\$0</td> <td>\$0</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>(\$300)</td> <td>\$900</td> </tr> </tbody> </table>		4% Tax Credits	9% Tax Credits	\$0	\$0	\$0	\$0	\$0	\$0	\$600	\$900	(\$900)	\$0	\$0	\$0	\$0	\$0			(\$300)	\$900
4% Tax Credits	9% Tax Credits																								
\$0	\$0																								
\$0	\$0																								
\$0	\$0																								
\$600	\$900																								
(\$900)	\$0																								
\$0	\$0																								
\$0	\$0																								
(\$300)	\$900																								
Direct Construction Costs	\$54,890,000	\$54,890,000	\$54,890,000																						
Permits and Fees	\$1,725,000	\$1,725,000	\$1,725,000																						
Soft Costs	\$4,782,400	\$5,127,400	\$5,299,900																						
Financing Costs/Savings	\$6,554,745	\$6,037,245	\$6,554,745																						
Capitalized Operating Reserve (3)	\$0	\$1,632,118	\$2,144,103																						
Developer Fee/Profit (4)	\$8,233,215	\$1,900,000	\$1,300,000																						
TOTAL COST	\$90,565,360	\$85,691,763	\$86,293,748																						
Total Cost Per Unit	\$157,505	\$149,029	\$150,076																						
Assumptions and Calculations																									
Tax Credit Basis																									
Land Acquisition Costs	N/A	\$0	\$0	% of Cost in Basis (Excluding Land) <table border="1"> <tbody> <tr> <td>0%</td> <td>0%</td> </tr> <tr> <td>100%</td> <td>100%</td> </tr> <tr> <td>100%</td> <td>100%</td> </tr> <tr> <td>80%</td> <td>45%</td> </tr> <tr> <td>55%</td> <td>75%</td> </tr> <tr> <td>100%</td> <td>100%</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>92%</td> <td>91%</td> </tr> </tbody> </table>		0%	0%	100%	100%	100%	100%	80%	45%	55%	75%	100%	100%			92%	91%				
0%	0%																								
100%	100%																								
100%	100%																								
80%	45%																								
55%	75%																								
100%	100%																								
92%	91%																								
Direct Construction Costs	N/A	\$54,890,000	\$54,890,000																						
Permits and Fees	N/A	\$1,725,000	\$1,725,000																						
Soft Costs	N/A	\$4,101,920	\$2,384,955																						
Financing Costs	N/A	\$3,320,485	\$4,916,059																						
Developer Overhead and Profit	N/A	\$1,900,000	\$1,300,000																						
Total Undadjusted Tax Credit Basis	N/A	\$65,937,405	\$65,216,014																						
Basis Boost (%) (5)	N/A	100%	100%																						
Total Adjusted Tax Credit Basis	N/A	\$65,937,405	\$65,216,014																						
Tax Credit Rate (Per NCHFA) (6)	N/A	3.21%	9.00%																						
Annual Tax Credits (7)	N/A	\$2,116,591	\$5,869,441																						
Tax Credit Pricing	N/A	\$1.10	\$1.05																						
Maximum Federal Tax Credit Equity (8)		\$23,282,498	\$61,629,133																						

N/A = not applicable.

- (1) Minimum of maximum tax credit equity or amount needed for feasibility.
- (2) DRA did not estimate the deferred developer fees that could be used to reduce or close the gap.
- (3) NCHFA requires a capitalized operating reserve equal to 6 months debt service and operating expenses for 9% tax credit projects and 4 months for bond projects.
- (4) Maximum developer fee permitted by the NCHFA is \$13,000 per unit for new construction projects, up to a maximum of \$1.3 million for 9% tax credit projects and \$1.9 million for bond projects.
- (5) Projects located in a Qualified Census Tract (QCT) or Difficult to Develop Area (DDA) are eligible for a 30% basis boost.
- (6) 2016 tax credit factors from the North Carolina Housing Finance Agency.
- (7) Adjusted tax credit basis multiplied by tax credit rate.
- (8) Equals annual tax credits multiplied by tax credit pricing multiplied by 10 years.

Source: DRA

Table 21
Leveraged Financing Analysis: Rents and Affordable Mortgage
Prototype 4
Greene Tract
Chapel Hill Affordability Gap and Economic Analysis

	Projections			Assumptions		
	No Tax Credits	4% Tax Credits, Tax Exempt Bonds	9% Tax Credits	No Tax Credits	4% Tax Credits, Tax Exempt Bonds	9% Tax Credits
Number of Units by Income Level				Percent of Units by Income Level and Unit Bedroom Count		
30% AMI				30% AMI	30% AMI	30% AMI
One Bedroom	0	0	2	0%	0%	20%
Two Bedroom	0	0	4	0%	0%	20%
Three Bedroom	0	0	2	0%	0%	20%
40% AMI				40% AMI	40% AMI	40% AMI
One Bedroom	0	0	0	0%	0%	0%
Two Bedroom	0	0	0	0%	0%	0%
Three Bedroom	0	0	0	0%	0%	0%
50% AMI				50% AMI	50% AMI	50% AMI
One Bedroom	0	0	2	0%	0%	20%
Two Bedroom	0	0	4	0%	0%	20%
Three Bedroom	0	0	2	0%	0%	20%
60% AMI				60% AMI	60% AMI	60% AMI
One Bedroom	10	10	6	100%	100%	60%
Two Bedroom	20	20	12	100%	100%	60%
Three Bedroom	10	10	6	100%	100%	60%
Monthly Gross Rents				Monthly Rent by Income Level and Bedroom Count		
30% AMI				30% AMI	Per Unit	Total Project
One Bedroom	\$0	\$0	\$644	One Bedroom	\$322	
Two Bedroom	\$0	\$0	\$1,536	Two Bedroom	\$384	
Three Bedroom	\$0	\$0	\$878	Three Bedroom	\$439	
40% AMI				40% AMI		
One Bedroom	\$0	\$0	\$0	One Bedroom	\$454	
Two Bedroom	\$0	\$0	\$0	Two Bedroom	\$543	
Three Bedroom	\$0	\$0	\$0	Three Bedroom	\$623	
50% AMI				50% AMI		
One Bedroom	\$0	\$0	\$1,174	One Bedroom	\$587	
Two Bedroom	\$0	\$0	\$2,808	Two Bedroom	\$702	
Three Bedroom	\$0	\$0	\$1,614	Three Bedroom	\$807	
60% AMI				60% AMI		
One Bedroom	\$7,130	\$7,130	\$4,278	One Bedroom	\$713	
Two Bedroom	\$17,080	\$17,080	\$10,248	Two Bedroom	\$854	
Three Bedroom	\$9,880	\$9,880	\$5,928	Three Bedroom	\$988	
Gross Restricted Rents	\$409,080	\$409,080	\$349,296			
Less: Vacancy	(\$28,636)	(\$28,636)	(\$24,451)			
Less: Operating Costs	(\$176,000)	(\$176,000)	(\$176,000)			
Less: Replacement Reserves	(\$10,000)	(\$10,000)	(\$10,000)			
Net Operating Income	\$194,444	\$194,444	\$138,845			
Annual Debt Service	\$162,037	\$162,037	\$120,735			
Permanent Mortgage Amount	\$2,252,201	\$2,515,376	\$1,678,132			
Vacancy Rate (1)	7.00%	7.00%	7.00%			
Annual Operating Cost Per Unit	\$4,400	\$4,400	\$4,400			
Annual Replace. Reserve/Unit (1)	\$250	\$250	\$250			
Mortgage Interest Rate	6.00%	5.00%	6.00%			
Debt Coverage Ratio	1.20	1.20	1.15			
Term (Years)	30	30	30			
				Total Number of Units: 40		
				One Bedroom	Two Bedroom	Three Bedroom
				10	20	10

(1) Minimum vacancy rate of 7.0% and minimum annual replacement reserves of \$250 per unit for new construction projects from 2016 QAP for North Carolina.

Source: DRA

Table 22
Leveraged Financing Analysis: Sources and Uses
Prototype 4
Greene Tract
Chapel Hill Affordability Gap and Economic Analysis

SOURCES AND USES	4% Tax Credits, Tax			Assumptions	
	No Tax Credits	Exempt Bonds	9% Tax Credits		
PERMANENT SOURCES OF FUNDS				Total Units	40
Federal Tax Credit Equity (1)	\$0	\$1,755,743	\$3,806,297	Acres	6.30
Permanent Mortgage	\$2,066,877	\$2,308,397	\$1,484,751	Unit/Acre	6.35
Deferred Developer Fee (2)	\$0	\$0	\$0		
Tax Increment Financing, Owner Units	\$0		\$0		
Gap Financing Required	\$3,038,760	\$1,143,065	\$0		
TOTAL SOURCES	\$5,105,637	\$5,207,205	\$5,291,048		
Permanent Gap Financing/Unit	\$75,969	\$28,577	\$0		
PERMANENT USES OF FUNDS				Difference in Per Unit Cost Comared to	
Land Acquisition Costs	\$0	\$0	\$0	"No Tax Credit" Scenario	
Direct Construction Costs	\$4,100,000	\$4,100,000	\$4,100,000	4% Tax Credits	9% Tax Credits
Permits and Fees	\$120,000	\$120,000	\$120,000	\$0	\$0
Soft Costs	\$228,000	\$252,000	\$264,000	\$0	\$0
Financing Costs/Savings	\$193,488	\$157,488	\$193,488	\$600	\$900
Capitalized Operating Reserve (3)	\$0	\$113,568	\$149,411	(\$900)	\$0
Developer Fee/Profit (4)	\$464,149	\$464,149	\$464,149	\$0	\$0
TOTAL COST	\$5,105,637	\$5,207,205	\$5,291,048		
Total Cost Per Unit	\$127,641	\$130,180	\$132,276	(\$300)	\$900
Assumptions and Calculations					
Tax Credit Basis				% of Cost in Basis (Excluding Land)	
Land Acquisition Costs	N/A	\$0	\$0	0%	0%
Direct Construction Costs	N/A	\$4,100,000	\$4,100,000	100%	100%
Permits and Fees	N/A	\$120,000	\$120,000	100%	100%
Soft Costs	N/A	\$201,600	\$118,800	80%	45%
Financing Costs	N/A	\$86,618	\$145,116	55%	75%
Developer Overhead and Profit	N/A	\$464,149	\$464,149	100%	100%
Total Undajusted Tax Credit Basis	N/A	\$4,972,367	\$4,948,065		
Basis Boost (%) (5)	N/A	100%	100%	95%	94%
Total Adjusted Tax Credit Basis	N/A	\$4,972,367	\$4,948,065		
Tax Credit Rate (Per NCHFA) (6)	N/A	3.21%	9.00%		
Annual Tax Credits (7)	N/A	\$159,613	\$445,326		
Tax Credit Pricing	N/A	\$1.10	\$1.05		
Maximum Federal Tax Credit Equity (8)		\$1,755,743	\$4,675,921		

N/A = not applicable.

- (1) Minimum of maximum tax credit equity or amount needed for feasibility.
- (2) DRA did not estimate the deferred developer fees that could be used to reduce or close the gap.
- (3) NCHFA requires a capitalized operating reserve equal to 6 months debt service and operating expenses for 9% tax credit projects and 4 months for bond projects.
- (4) Maximum developer fee permitted by the NCHFA is \$13,000 per unit for new construction projects, up to a maximum of \$1.3 million for 9% tax credit projects and \$1.9 million for bond projects.
- (5) Projects located in a Qualified Census Tract (QCT) or Difficult to Develop Area (DDA) are eligible for a 30% basis boost.
- (6) 2016 tax credit factors from the North Carolina Housing Finance Agency.
- (7) Adjusted tax credit basis multiplied by tax credit rate.
- (8) Equals annual tax credits multiplied by tax credit pricing multiplied by 10 years.

Source: DRA

Table 23
Net Operating Income from Market-Rate Apartments
100% Market Rate Units
Chapel Hill Affordability Gap and Economic Analysis

	Prototype 1 Ephesus Fordham	Prototype 1 Ephesus Fordham w/ Density Bonus	Prototype 3 Legion Road	Prototype 3 Legion Road w/ Density Bonus
Tenure	Rental	Rental	Rental	Rental
Net Rentable SF of Apartment Space	110,600	138,350	502,900	628,900
Parking Spaces	0	0	0	0
Net Rentable SF of Retail Space	0	0	0	0
Approximate Building Stories	5	6	4	4
Number of Apartment Units				
Studio/Loft	14	17	0	0
One Bedroom	34	43	144	180
Two Bedroom	68	85	288	360
Two Bedroom/Two Bath	0	0	0	0
Three Bedroom	20	25	143	179
Total	136	170	575	719
Unit Size (Square Feet)				
Studio/Loft	500	500	500	500
One Bedroom	700	700	700	700
Two Bedroom	850	850	850	850
Two Bedroom/Two Bath	-	-	-	-
Three Bedroom	1,100	1,100	1,100	1,100
Average	813	814	875	875
Average Monthly Rent Per Square Foot	\$1.91	\$1.91	\$1.89	\$1.89
Studio/Loft	\$2.05	\$2.05	\$2.05	\$2.05
One Bedroom	\$1.95	\$1.95	\$1.95	\$1.95
Two Bedroom	\$1.90	\$1.90	\$1.90	\$1.90
Three Bedroom	\$1.85	\$1.85	\$1.85	\$1.85
Average--Calculated	\$1.91	\$1.91	\$1.89	\$1.89
Average Monthly Rent Per Unit				
Studio/Loft	\$1,553	\$1,555	\$1,658	\$1,658
One Bedroom	\$1,025	\$1,025	\$1,025	\$1,025
Two Bedroom	\$1,365	\$1,365	\$1,365	\$1,365
Three Bedroom	\$1,615	\$1,615	\$1,615	\$1,615
Three Bedroom	\$2,035	\$2,035	\$2,035	\$2,035
Parking Income (\$/Space/Year)	\$0	\$0	\$0	\$0
Parking Usage Rate	0%	0%	0%	0%
Miscellaneous Income (\$/Unit/Year)	\$120	\$120	\$120	\$120
Rental Vacancy Rate	5.0%	5.0%	5.0%	5.0%
Rental Operating Cost/Unit (2)	\$7,800	\$7,800	\$7,800	\$7,800
Total Monthly Gross Rental Income	\$211,280	\$264,270	\$952,685	\$1,191,365
Annual Gross Income	\$2,535,360	\$3,171,240	\$11,432,220	\$14,296,380
Less: Vacancy	(\$126,768)	(\$158,562)	(\$571,611)	(\$714,819)
Plus: Parking Income	\$0	\$0	\$0	\$0
Plus: Misc. Income	\$16,320	\$20,400	\$69,000	\$86,280
Plus: Retail Income	\$0	\$0	\$0	\$0
Adjusted Annual Gross Income	\$2,424,912	\$3,033,078	\$10,929,609	\$13,667,841
Operating Costs				
Apartment Operating Costs	(\$1,060,800)	(\$1,326,000)	(\$4,485,000)	(\$5,608,200)
Net Operating Income	\$1,364,112	\$1,707,078	\$6,444,609	\$8,059,641

Source: DRA

Table 24
Net Sales Proceeds from Market-Rate Owner Housing
100% Market Rate Units
Chapel Hill Affordability Gap and Economic Analysis

	Prototype 2	Prototype 4	Prototype 5
	Craig-Gomains	Greene Tract	Sunrise
Tenure	Owner	Owner	Owner
Product Type	TH	TH	SFD
Net Saleable SF of Living Area	48,400	72,600	92,000
Number of Owner Hsg. Units			
Studio/Loft	0	0	0
One Bedroom	0	0	0
Two Bedroom	12	18	15
Two Bedroom/Two Bath	0	0	0
Three Bedroom	28	42	35
Total	40	60	50
Unit Size (Square Feet)			
Studio/Loft	-	-	-
One Bedroom	-	-	-
Two Bedroom	1,000	1,000	1,700
Two Bedroom/Two Bath	-	-	-
Three Bedroom	1,300	1,300	1,900
Average	1,210	1,210	1,840
Average Sales Price Per Square Foot	\$190.00	\$190.00	\$175.00
Average Sales Price Per Unit	\$229,900	\$229,900	\$322,000
Sales Costs (% of Gross Sales Income)	5%	5%	5%
Total Gross Sales Proceeds	\$9,196,000	\$13,794,000	\$16,100,000
Less: Sales Costs	(\$459,800)	(\$689,700)	(\$805,000)
Net Sales Proceeds	\$8,736,200	\$13,104,300	\$15,295,000
Net Sales Proceeds Per Net Saleable SF	\$181	\$181	\$166

Source: DRA

Table 25
Affordable Units by Prototype and Income Level
Rental Housing Inclusionary Scenarios
Chapel Hill Affordability Gap and Economic Analysis

		Prototype 1 Ephesus Fordham w/ Density Bonus	Prototype 3 Legion Road w/ Density Bonus
Tenure		Rental	Rental
Net Rentable SF of Residential Space		138,350	628,900
Net Rentable SF of Retail Space		0	0
Approximate Building Stories		6	4
Number of Apartment Units			
Studio/Loft		17	0
One Bedroom		43	180
Two Bedroom		85	360
Two Bedroom/Two Bath		0	0
Three Bedroom		25	179
Total Units		170	719
Affordable Units by Income Level and Scenario	% Affordable		
SCENARIO 1			
30% of AMI	5.0%		
Studio/Loft		1	0
One Bedroom		2	9
Two Bedroom		4	18
Two Bedroom/Two Bath		0	0
Three Bedroom		1	9
SCENARIO 2			
50% of AMI	5.0%		
Studio/Loft		1	0
One Bedroom		2	9
Two Bedroom		4	18
Two Bedroom/Two Bath		0	0
Three Bedroom		1	9
SCENARIO 3			
60% of AMI	5.0%		
Studio/Loft		1	0
One Bedroom		2	9
Two Bedroom		4	18
Two Bedroom/Two Bath		0	0
Three Bedroom		1	9
SCENARIO 4			
50% of AMI	10.0%		
Studio/Loft		2	0
One Bedroom		4	18
Two Bedroom		9	36
Two Bedroom/Two Bath		0	0
Three Bedroom		3	18
Total Inclusionary Units by Scenario:			
Scenario 1: No. of Units		8	36
% of Units		4.7%	5.0%
Scenario 2: No. of Units		8	36
% of Units		4.7%	5.0%
Scenario 3: No. of Units		8	36
% of Units		4.7%	5.0%
Scenario 4: No. of Units		18	72
% of Units		10.6%	10.0%

Source: DRA.

Table 26
Rental Housing Income from Inclusionary Units
Rental Housing Inclusionary Scenarios
Chapel Hill Affordability Gap and Economic Analysis

	Prototype 1 Ephesus Fordham w/ Density Bonus	Prototype 3 Legion Road w/ Density Bonus
Tenure	Rental	Rental
Product Type	Stacked Flat Apts.	Stacked Flat Apts.
Net Rentable SF of Apartment Space	138,350	628,900
Net Rentable SF of Retail Space	0	0
Approximate Building Stories	6	4
Total Housing Units		
Studio/Loft	17	0
One Bedroom	43	180
Two Bedroom	85	360
Two Bedroom/Two Bath	0	0
Three Bedroom	25	179
Total Units	170	719
Total Monthly Rents for Affordable Units % Affordable by Income Level and Scenario		
SCENARIO 1: 5% @ 30% AMI		
30% of AMI 5.0%		
Studio/Loft	\$305	\$0
One Bedroom	\$644	\$2,898
Two Bedroom	\$1,536	\$6,912
Two Bedroom/Two Bath	\$0	\$0
Three Bedroom	\$439	\$3,951
SCENARIO 2: 5% at 50% AMI		
50% of AMI 5.0%		
Studio/Loft	\$553	\$0
One Bedroom	\$1,174	\$5,283
Two Bedroom	\$2,808	\$12,636
Two Bedroom/Two Bath	\$0	\$0
Three Bedroom	\$807	\$7,263
SCENARIO 3: 5% at 60% AMI		
60% of AMI 5.0%		
Studio/Loft	\$676	\$0
One Bedroom	\$1,438	\$6,471
Two Bedroom	\$3,444	\$15,498
Two Bedroom/Two Bath	\$0	\$0
Three Bedroom	\$991	\$8,919
SCENARIO 4: 10% at 50% AMI		
50% of AMI 10.0%		
Studio/Loft	\$1,106	\$0
One Bedroom	\$2,348	\$10,566
Two Bedroom	\$6,318	\$25,272
Two Bedroom/Two Bath	\$0	\$0
Three Bedroom	\$2,421	\$14,526
Total Affordable Unit Rents by Scenario		
Scenario 1	\$2,924	\$13,761
Scenario 2	\$5,342	\$25,182
Scenario 3	\$6,549	\$30,888
Scenario 4	\$12,193	\$50,364

Source: DRA

Table 27
Total Gross Rental Income by Scenario
Rental Housing Inclusionary Scenarios
Chapel Hill Affordability Gap and Economic Analysis

	Prototype 1 Ephesus Fordham w/ Density Bonus	Prototype 3 Legion Road w/ Density Bonus
Tenure	Rental	Rental
Product Type	Stacked Flat Apts.	Stacked Flat Apts.
Net Rentable SF of Apartment Space	138,350	628,900
Approximate Building Stories	6	4
Total Housing Units		
Studio/Loft	17	0
One Bedroom	43	180
Two Bedroom	85	360
Three Bedroom	25	179
Total Housing Units	170	719
Average Monthly Market Rent Per Unit		
Studio/Loft	\$1,025	\$1,025
One Bedroom	\$1,365	\$1,365
Two Bedroom	\$1,615	\$1,615
Three Bedroom	\$2,035	\$2,035
Market-Rate Units by Scenario		
SCENARIO 1: 5% @ 30% AMI		
Studio/Loft	16	0
One Bedroom	41	171
Two Bedroom	81	342
Three Bedroom	24	170
Total	162	683
Market-Rate Units as % of Total Units	95%	95%
SCENARIO 2: 5% at 50% AMI		
Studio/Loft	16	0
One Bedroom	41	171
Two Bedroom	81	342
Three Bedroom	24	170
Total	162	683
Market-Rate Units as % of Total Units	95%	95%
SCENARIO 3: 5% at 60% AMI		
Studio/Loft	16	0
One Bedroom	41	171
Two Bedroom	81	342
Three Bedroom	24	170
Total	162	683
Market-Rate Units as % of Total Units	95%	95%
SCENARIO 4: 10% at 50% AMI		
Studio/Loft	15	0
One Bedroom	39	162
Two Bedroom	76	324
Three Bedroom	22	161
Total	152	647
Market-Rate Units as % of Total Units	89%	90%
Total Monthly Market-Rate Unit Rents by Scenario		
SCENARIO 1: 5% @ 30% AMI		
Studio/Loft	\$16,400	\$0
One Bedroom	\$55,965	\$233,415
Two Bedroom	\$130,815	\$552,330
Three Bedroom	\$48,840	\$345,950
Total	\$252,020	\$1,131,695
SCENARIO 2: 5% at 50% AMI		
Studio/Loft	\$16,400	\$0
One Bedroom	\$55,965	\$233,415
Two Bedroom	\$130,815	\$552,330
Three Bedroom	\$48,840	\$345,950
Total	\$252,020	\$1,131,695
SCENARIO 3: 5% at 60% AMI		
Studio/Loft	\$16,400	\$0
One Bedroom	\$55,965	\$233,415
Two Bedroom	\$130,815	\$552,330
Three Bedroom	\$48,840	\$345,950
Total	\$252,020	\$1,131,695
SCENARIO 4: 10% at 50% AMI		
Studio/Loft	\$15,375	\$0
One Bedroom	\$53,235	\$221,130
Two Bedroom	\$122,740	\$523,260
Three Bedroom	\$44,770	\$327,635
Total	\$236,120	\$1,072,025
Total Monthly Rental Income by Scenario		
SCENARIO 1: 5% @ 30% AMI		
Market-Rate Units	\$252,045	\$1,131,693
Inclusionary Units	\$2,924	\$13,761
Total	\$254,969	\$1,145,454
SCENARIO 2: 5% at 50% AMI		
Market-Rate Units	\$252,045	\$1,131,693
Inclusionary Units	\$5,342	\$25,182
Total	\$257,387	\$1,156,875
SCENARIO 3: 5% at 60% AMI		
Market-Rate Units	\$253,000	\$1,131,693
Inclusionary Units	\$6,549	\$30,888
Total	\$259,549	\$1,162,581
SCENARIO 4: 10% at 50% AMI		
Market-Rate Units	\$236,120	\$1,072,025
Inclusionary Units	\$12,193	\$50,364
Total	\$248,313	\$1,122,389

Source: DRA

Table 28
Apartment NOI by Scenario
Rental Housing Inclusionary Scenarios
Chapel Hill Affordability Gap and Economic Analysis

	Prototype 1 Ephesus Fordham w/ Density Bonus	Prototype 3 Legion Road w/ Density Bonus
Tenure	Rental	Rental
Product Type	Stacked Flat Apts.	Stacked Flat Apts.
Net Rentable SF of Apartment Space	138,350	628,900
Approximate Building Stories	6	4
Number of Apartment Units		
Studio/Loft	17	0
One Bedroom	43	180
Two Bedroom	85	360
Two Bedroom/Two Bath	0	0
Three Bedroom	25	179
Total	170	719
Unit Size (Square Feet)		
Studio/Loft	500	500
One Bedroom	700	700
Two Bedroom	850	850
Two Bedroom/Two Bath	-	-
Three Bedroom	1,100	1,100
Average	814	875
Rental Vacancy Rate: Market Units	5.0%	5.0%
Rental Vacancy Rate: Inclusionary Units	3.0%	3.0%
Rental Operating Cost/Market Rate Unit (1)	\$7,800	\$7,800
Rental Operating Cost/Affordable Unit (2)	\$4,400	\$4,400
SCENARIO 1: 5% @ 30% AMI		
Market-Rate Units	162	683
Inclusionary Units	8	36
Operating Cost per Unit for Inclusionary Units (2)	\$4,400	\$4,400
Total Monthly Gross Rental Income		
Market-Rate Units	\$252,045	\$1,131,693
Inclusionary Units	\$2,924	\$13,761
Annual Gross Rental Income	\$3,059,628	\$13,745,443
Less: Vacancy, Market-Rate Units	(\$151,227)	(\$679,016)
Less: Vacancy, Inclusionary Units	(\$1,053)	(\$4,954)
Adjusted Annual Gross Income	\$2,907,348	\$13,061,473
Less: Operating Costs, Market-Rate Units	(\$1,263,600)	(\$5,327,400)
Less: Operating Costs, Inclusionary Units	(\$35,200)	(\$158,400)
Net Operating Income	\$1,608,548	\$7,575,673
SCENARIO 2: 5% at 50% AMI		
Market-Rate Units	162	683
Inclusionary Units	8	36
Operating Cost per Unit for Inclusionary Units (2)	\$4,400	\$4,400
Total Monthly Gross Rental Income		
Market-Rate Units	\$252,045	\$1,131,693
Inclusionary Units	\$5,342	\$25,182
Annual Gross Rental Income	\$3,088,644	\$13,882,495
Less: Vacancy, Market-Rate Units	(\$151,227)	(\$679,016)
Less: Vacancy, Inclusionary Units	(\$1,923)	(\$9,066)
Adjusted Annual Gross Income	\$2,935,494	\$13,194,414
Less: Operating Costs, Market-Rate Units	(\$1,263,600)	(\$5,327,400)
Less: Operating Costs, Inclusionary Units	(\$35,200)	(\$158,400)
Net Operating Income	\$1,636,694	\$7,708,614
SCENARIO 3: 5% at 60% AMI		
Market-Rate Units	162	683
Inclusionary Units	8	36
Operating Cost per Unit for Inclusionary Units (2)	\$4,400	\$4,400
Total Monthly Gross Rental Income		
Market-Rate Units	\$253,000	\$1,131,693
Inclusionary Units	\$6,549	\$30,888
Annual Gross Rental Income	\$3,114,589	\$13,950,967
Less: Vacancy, Market-Rate Units	(\$151,800)	(\$697,548)
Less: Vacancy, Inclusionary Units	(\$2,358)	(\$11,120)
Adjusted Annual Gross Income	\$2,960,431	\$13,242,299
Less: Operating Costs, Market-Rate Units	(\$1,263,600)	(\$5,327,400)
Less: Operating Costs, Inclusionary Units	(\$35,200)	(\$158,400)
Net Operating Income	\$1,661,631	\$7,756,499
SCENARIO 4: 10% at 50% AMI		
Market-Rate Units	152	647
Inclusionary Units	18	72
Inclusionary Parking Spaces	0	0
Market-Rate Parking Spaces	0	0
Operating Cost per Unit for Inclusionary Units (2)	\$4,400	\$4,400
Total Monthly Gross Rental Income		
Market-Rate Units	\$236,095	\$1,072,020
Inclusionary Units	\$12,193	\$50,364
Annual Gross Rental Income	\$2,979,458	\$13,468,609
Less: Vacancy, Market-Rate Units	(\$141,657)	(\$643,212)
Less: Vacancy, Inclusionary Units	(\$7,316)	(\$30,218)
Adjusted Annual Gross Income	\$2,830,486	\$12,795,179
Less: Operating Costs, Market-Rate Units	(\$1,185,600)	(\$5,046,600)
Less: Operating Costs, Inclusionary Units	(\$79,200)	(\$316,800)
Net Operating Income	\$1,565,686	\$7,431,779

(1) For market-rate units, including property taxes.

(2) Assumes property tax exemption for affordable units.

Source: DRA

Table 29
Return on Equity Analysis
Selected Prototypes
Chapel Hill Affordability Gap and Economic Analysis

	Prototype 1 Ephesus Fordham	Prototype 1 Ephesus Fordham w/ Density Bonus	Prototype 3 Legion Road	Prototype 3 Legion Road w/ Density Bonus	Prototype 5 Sunrise
<i>Tenure</i>	<i>Rental</i>	<i>Rental</i>	<i>Rental</i>	<i>Rental</i>	<i>Owner</i>
<i>Product Type</i>	<i>Stacked Flat Apts.</i>	<i>Stacked Flat Apts.</i>	<i>Stacked Flat Apts.</i>	<i>Stacked Flat Apts.</i>	<i>SFD</i>
<i>Residential Units</i>	136	170	575	719	50
<i>Site Area (SF)</i>	148,104	148,104	1,568,160	1,568,160	1,053,281
<i>Residential Net SF</i>	110,600	138,350	502,900	628,900	92,000
<i>Total Net SF</i>	110,600	138,350	502,900	628,900	92,000
<i>Approximate Building Stories</i>	5	6	4	4	2
Total Annual Net Operating Income, Apartments					
100% Market Rate	\$1,364,112	\$1,707,078	\$6,444,609	\$8,059,641	
NOI Per NSF	\$12.33	\$12.34	\$12.81	\$12.82	
Scenario 1: 5% at 30% AMI		\$1,608,548		\$7,575,673	
NOI Per NSF		\$11.63		\$12.05	
Scenario 2: 5% at 50% AMI		\$1,636,694		\$7,708,614	
NOI Per NSF		\$11.83		\$12.26	
Scenario 3: 5% at 60% AMI		\$1,661,631		\$7,756,499	
NOI Per NSF		\$12.01		\$12.33	
Scenario 4: 10% at 50% AMI		\$1,565,686		\$7,431,779	
NOI Per NSF		\$11.32		\$11.82	
Cap Rate, Residential	5.90%	5.90%	5.90%	5.90%	
Equity Yield on NOI	8.00%	8.00%	8.00%	8.00%	8.00%
Capitalized Value, Apartments					
100% Market Rate	\$23,120,542	\$28,933,525	\$109,230,661	\$136,604,085	
Scenario 1: 5% at 30% AMI		\$27,263,533		\$128,401,241	
Scenario 2: 5% at 50% AMI		\$27,740,575		\$130,654,469	
Scenario 3: 5% at 60% AMI		\$28,163,243		\$131,466,080	
Scenario 4: 10% at 50% AMI		\$26,537,044		\$125,962,355	
Net Home Sales Proceeds					\$16,100,000
100% Market Rate					
Scenario 1: 5% at 30% AMI					
Scenario 2: 5% at 50% AMI					
Scenario 3: 5% at 60% AMI					
Scenario 4: 10% at 50% AMI					
Total Market Value (Capitalized NOI for Rental; Net Sales Proceeds for Ownership)					
100% Market Rate	\$23,120,542	\$28,933,525	\$109,230,661	\$136,604,085	\$16,100,000
Per NSF	\$209	\$209	\$217	\$217	\$175
Scenario 1: 5% at 30% AMI		\$27,263,533		\$128,401,241	
Per NSF		\$197		\$204	
Scenario 2: 5% at 50% AMI		\$27,740,575		\$130,654,469	
Per NSF		\$201		\$208	
Scenario 3: 5% at 60% AMI		\$28,163,243		\$131,466,080	
Per NSF		\$204		\$209	
Scenario 4: 10% at 50% AMI		\$26,537,044		\$125,962,355	
Per NSF		\$192		\$200	
Less: Total Development Cost, Include. Land	\$27,239,475	\$33,313,181	\$90,565,360	\$109,728,263	\$14,940,416
Per NSF	\$246	\$241	\$180	\$174	\$162
Net Value of Investment					
100% Market Rate	(\$4,118,933)	(\$4,379,655)	\$18,665,301	\$26,875,822	\$1,159,584
Per SF Site Area	(\$27.81)	(\$29.57)	\$11.90	\$17.14	\$1.10
Per Dwelling Unit	(\$30,286)	(\$25,763)	\$32,461	\$37,379	\$23,192
Return on Equity (1)	-20%	-16%	25%	27%	21%
Scenario 1: 5% at 30% AMI		(\$6,049,648)		\$18,672,978	
Per SF Site Area		(\$40.85)		\$11.91	
Per Dwelling Unit		(\$35,586)		\$25,971	
Return on Equity (1)		-22%		19%	
Scenario 2: 5% at 50% AMI		(\$5,572,606)		\$20,926,206	
Per SF Site Area		(\$37.63)		\$13.34	
Per Dwelling Unit		(\$32,780)		\$29,105	
Return on Equity (1)		-20%		21%	
Scenario 3: 5% at 60% AMI		(\$5,149,938)		\$21,737,817	
Per SF Site Area		(\$34.77)		\$13.86	
Per Dwelling Unit		(\$30,294)		\$30,233	
Return on Equity (1)		-19%		22%	
Scenario 4: 10% at 50% AMI		(\$6,776,137)		\$16,234,093	
Per SF Site Area		(\$45.75)		\$10.35	
Per Dwelling Unit		(\$39,860)		\$22,579	
Return on Equity (1)		-25%		16%	
Equity Investment @ 30%	\$8,171,843	\$9,993,954	\$27,169,608	\$32,918,479	\$4,482,125
Assumed Investment Period (Years)	2.5	2.8	2.8	3.0	1.3

(1) Return on equity measured as net project value divided by the number of years equity investment divided by total equity investment.
(2) Annual net cash flow (NOI less debt service) divided by total equity investment.

Source: DRA.

Table 30
Land Residual Analysis
Selected Prototypes
Chapel Hill Affordability Gap and Economic Analysis

Resid. Cap Rate	5.90%
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	Prototype 1 Ephesus Fordham	Prototype 1 Ephesus Fordham w/ Density Bonus	Prototype 3 Legion Road	Prototype 3 Legion Road w/ Density Bonus	Prototype 5 Sunrise
<i>Tenure</i>					Owner
<i>Product Type</i>	Stacked Flat Apts.	Stacked Flat Apts.	Stacked Flat Apts.	Stacked Flat Apts.	SFD
<i>Residential Units</i>	136	170	575	719	50
<i>Site Area (SF)</i>	148,104	148,104	1,568,160	1,568,160	1,053,281
<i>Residential Net SF</i>	110,600	138,350	502,900	628,900	92,000
<i>Total Net SF</i>	110,600	138,350	502,900	628,900	92,000
<i>Approximate Building Stories</i>	5	6	4	4	2
Total Annual Net Operating Income, Apartments					
100% Market Rate	\$1,364,112	\$1,707,078	\$6,444,609	\$8,059,641	
NOI Per NSF	\$12.33	\$12.34	\$12.81	\$12.82	
Scenario 1: 5% at 30% AMI		\$1,608,548		\$7,575,673	
NOI Per NSF		\$11.63		\$12.05	
Scenario 2: 5% at 50% AMI		\$1,636,694		\$7,708,614	
NOI Per NSF		\$11.83		\$12.26	
Scenario 3: 5% at 60% AMI		\$1,661,631		\$7,756,499	
NOI Per NSF		\$12.01		\$12.33	
Scenario 4: 10% at 50% AMI		\$1,565,686		\$7,431,779	
NOI Per NSF		\$11.32		\$11.82	
Cap Rate, Residential	5.90%	5.90%	5.90%	5.90%	
Total Market Value (Capitalized NOI for Rental; Net Sales Proceeds for Ownership)					
100% Market Rate	\$23,120,542	\$28,933,525	\$109,230,661	\$136,604,085	\$16,100,000
Per NSF	\$209	\$209	\$217	\$217	\$175
Scenario 1: 5% at 30% AMI		\$27,263,533		\$128,401,241	
Per NSF		\$197		\$204	
Scenario 2: 5% at 50% AMI		\$27,740,575		\$130,654,469	
Per NSF		\$201		\$208	
Scenario 3: 5% at 60% AMI		\$28,163,243		\$131,466,080	
Per NSF		\$204		\$209	
Scenario 4: 10% at 50% AMI		\$26,537,044		\$125,962,355	
Per NSF		\$192		\$200	
Less: Total Development Cost, Excluding Land	\$23,839,475	\$29,913,181	\$76,185,360	\$95,348,263	\$13,290,416
Per NSF	\$216	\$216	\$151	\$152	\$144
Less: Assumed Return on Equity (See Below)	\$1,430,369	\$1,974,270	\$5,028,234	\$6,865,075	\$398,712
Residual Land Value					
100% Market Rate	(\$2,149,302)	(\$2,953,925)	\$28,017,068	\$34,390,747	\$2,410,872
Per SF Site Area	(\$15)	(\$20)	\$18	\$22	\$2
Per Dwelling Unit	(\$15,804)	(\$17,376)	\$48,725	\$47,831	\$48,217
Scenario 1: 5% at 30% AMI		(\$4,623,918)		\$26,187,903	
Per SF Site Area		(\$31)		\$17	
Per Dwelling Unit		(\$27,200)		\$36,423	
Scenario 2: 5% at 50% AMI		(\$4,146,875)		\$28,441,131	
Per SF Site Area		(\$28)		\$18	
Per Dwelling Unit		(\$24,393)		\$39,557	
Scenario 3: 5% at 60% AMI		(\$3,724,208)		\$29,252,742	
Per SF Site Area		(\$25)		\$19	
Per Dwelling Unit		(\$21,907)		\$40,685	
Scenario 4: 10% at 50% AMI		(\$5,350,407)		\$23,749,018	
Per SF Site Area		(\$36)		\$15	
Per Dwelling Unit		(\$31,473)		\$33,031	
Equity Investment @ 30% of TDC	\$7,151,842.62	\$8,973,954.25	\$22,855,608	\$28,604,479	\$3,987,125
Assumed Investment Period (Years)	2.5	2.8	2.8	3.0	1.3
Assumed Return on Equity (1)	8%	8%	8%	8%	8%

(1) Return on equity calculated as total equity investment multiplied by the assumed return on equity multiplied by the investment period.

Source: DRA.