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Expanding Housing Affordability

Feasibility Analysis

PREPARED FOR:

City and County of Denver
Community Planning and Development
www.denvergov.org/affordabilityincentive

REVISED

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EXPANDING HOUSING AFFORDABILITY

FEASIBILITY ANALYSIS

EXECUTIVE SUMMARY.

As a part of the Expanding Housing Affordability (EHA) project, the City and County of Denver retained Root Policy Research and ArLand Use Economics to evaluate the financial feasibility of new development to understand the impacts of a change to the linkage fee, inclusionary housing, and zoning incentives.

The EHA project focuses specifically on regulatory tools that can leverage new market-rate development to create and contribute to affordable housing needs. Additional details on the EHA project overall are available on the project website.¹

Financial Feasibility of EHA alternatives is based on proformas typically used in the real estate industry to determine whether a proposed development project is financially feasible. The feasibility model developed for this effort includes a comparative analysis of how proformas change under different affordability program scenarios, including changes to the linkage fee and inclusionary housing², and potential zoning incentives.

Development of the Feasibility Model (Model) was joint effort between Root Policy Research and ArLand Land Use Economics. The model is informed by market data on building costs and rents and incorporates variations by both geographic submarket and variations by development prototype/height. Underlying assumptions have also been calibrated through extensive stakeholder vetting.³

Overview of Modeling Approach

To conduct the financial feasibility analysis, Root Policy Research and ArLand Land Use Economics created base-case proformas of a variety of residential and commercial building prototypes in both typical and high-cost submarkets. Broadly speaking, high cost submarkets

¹ www.denvergov.org/affordabilityincentive

² HB-1117 allows communities across the state to require affordable housing on all new housing (including rental and ownership). The bill does include some guard rails to the regulation by requiring that a “choice of options” is provided. It also requires that local governments demonstrate its commitment to “increase the number the overall number and density of housing units... or create incentives to the construction of affordable housing units.” Learn more about the state level changes enabling for inclusionary housing to apply to rental housing at: www.leg.colorado.gov/bills/hb21-1117

³ Specific to this report, stakeholder outreach included: 1) Seventeen interviews with residential and commercial developers (both market rate and affordable), lenders, and architects active in the Denver market; 2) Six focus groups in which specific assumptions related to rent levels, building costs, soft costs, financing costs, and measures of return used to evaluate project outcomes were shared and discussed with developers; and 3) Multiple developers also shared specific recent project costs, estimates on current/planned developments, and recent proformas. Engagement was conducted in both 2020 (under the Affordable Housing Zoning Incentive project) and in May and July 2021 under the revised approach of the current EHA project. Additional outreach related to this effort can be found on the project website.

are those with extremely high land prices which typically support mid- and high-rise development prototypes. High cost submarkets areas also have higher rent premiums than typical submarkets.

Development prototypes included:

- For-sale residential: single unit; townhomes, 5-story condos, and 12-story condos;
- Rental residential: 3-, 5-, 8-, 12-, 16-, and 20-story multifamily developments; and
- Commercial: 3-, 5-, 8-, 12-, and 16-story office; 4- and 12-story hotels, standalone retail, and warehouse developments.

Following the development of base-case proformas, Root introduced affordability requirements (e.g., linkage fee increases or inclusionary housing policies) to each prototype and measured outcome variants by calculating the actual change in multiple output metrics, including Return on Equity (ROE), Return on Cash (ROC), Internal Rate of Return (IRR), and Cash on Cash return. These are the most common measures of return used by developers and investors in the real estate industry and include both short term and long-term measures. A development prototype must meet minimum targets⁴ on at least one short term feasibility measure (ROC or COC) and on one long-term feasibility measure (IRR or ROE) to be considered financially feasible.

Report Organization

The EHA Feasibility Analysis is organized around the following sections:

- Section I. Proforma Development and Assumptions provides context for the Denver development market, outlines all prototypes and assumptions used in the feasibility model, and reports baseline feasibility of development prototypes under current affordability requirements (i.e., current linkage fee).
- Section II. Linkage Fee Analysis reports the results of financial feasibility testing of various increases to the current linkage fee for nonresidential prototypes and low-density residential (single unit and townhomes) as large-scale residential developments would be exempt from linkage fees under an inclusionary housing system. It also provides a brief overview of the current linkage fee system and the maximum legally defensible fees (as established in the 2016 Nexus Study).
- Section III. Inclusionary Housing Feasibility reports the results of financial feasibility testing of various inclusionary housing requirements for residential prototypes (both rental and for-sale). It also offers a framework for calculating fee-in-lieu as an alternative to on-site build requirements.

⁴ ROC target is 5.5% on rental residential, 6.5% on for-sale residential, 7% on hotel, and 6% on office/other commercial; COC target 15% for for-sale residential and 6% for rental residential and commercial; IRR target is 10%; ROE target is 6%.

- Section IV. Inclusionary Incentives evaluates the financial benefit of a variety of potential incentives the City could offer to developers to encourage on-site construction of affordable units and/or exceeding baseline inclusionary requirements.

Additional details including proformas and case studies are included in the report's appendices.

What is "AMI" and why does it matter?

All inclusionary programs require a set number or percentage of income-restricted housing to be provided along with the market-rate (unrestricted) housing. Income-restricted housing commonly uses Area Median Income (AMI) to determine whether a household is considered low income and therefore eligible to obtain a restricted unit. The U.S. Department of Housing and Urban Development (HUD) uses AMI thresholds, adjusted by household size, to set the income thresholds households cannot exceed to be eligible for income-restricted affordable housing. This allows income-restricted housing programs to determine eligibility using income levels that make sense for a geographic area.

Instead of thinking about AMI as a table of numbers, it's important to understand that these categories represent people with jobs working in a range of professions. The table at right represents occupations for many people in the workforce and their associated income levels by AMI.

AMI %	2021 Income	Occupations by Income Category	2021 Max Rents (1-Bdrm, 1-2 per hh)
Income Limits (2-person household)			
31-50%	\$41,950	Fast Food Worker (\$27,530) Home Health Worker (\$30,350) Waiter (\$31,160) Child Care Worker (\$31,600) Nursing Assistant (\$34,470) Bank Teller (\$34,680) Pre-School Teacher (\$37,850) Construction Laborer (\$39,110) Hairstylist (\$40,420) Administrative Assistants (\$41,210)	\$886
51-60%	\$50,340	Bus Driver (\$42,280) EMT/Paramedic (\$42,900) Dental Assistant (\$43,930) Maintenance and Repair (\$44,170) Fitness Instructors (\$45,400) Community and Social Service Worker (\$46,060) Flight Attendants (\$50,010)	\$1,802
61-80%	\$67,120	Automotive Mechanic (\$51,000) Postal Service Mail Carriers (\$52,370) School Teacher (\$56,150) Social Worker (\$57,870) Tax Preparer (\$62,990) Reporter/Journalist (\$63,050) Firefighters (\$63,160)	\$1,467
81-100%	\$83,900	Building Inspector (\$71,980) Landscape Architects (\$75,600) Registered Nurse (\$77,860) Urban and Regional Planners (\$78,980)	\$1,869
101-120%	\$100,680	Architect (\$82,460) Computer Programmers (\$84,900) Physical Therapists (\$87,250) Financial Specialists (\$92,360) Veterinarians (\$95,900)	\$2,262

Source: 2021 HUD Income Limits and 2020 Bureau of Labor Statistics.

Key Findings

The financial feasibility analysis tested increases to the various linkage fees for nonresidential prototypes and low-density residential (based on property type), and inclusionary housing alternatives for residential prototypes. Key findings are below.

Linkage Fee Feasibility

- Linkage fees are one-time fees imposed on new development and are designed to offset the impact of new development on low wage job creation, which in turn creates demand for affordable housing.
- The current affordable housing linkage fees assessed are well below the maximum justifiable fee levels and below the feasibility thresholds from the initial nexus and feasibility study from 2016. According to the nexus and feasibility study⁵, legally justified fees range from \$9.60 per square foot (psf) on single-family residential development to \$119.29 psf on stand-alone retail development, including a variety of residential and commercial prototypes evaluated with legally justified fees within that range.
- Though the City is legally justified in assessing the maximum fees, the City has elected to assess actual fees well below the legally justifiable amount and the amount determined to be financially feasible. Current fees are between 1% and 10% of the legally justifiable fees and between 6% and 26% of what was determined to be financially feasible in 2016.
- According to Root’s updated analysis, linkage fees across all prototypes could be increased and still achieve the specified financial feasibility thresholds.⁶ Specifically:
 - Single unit infill could support linkage fees up to \$9.60 per square foot (psf);
 - Townhomes could support linkage fees up to \$14 psf;
 - Commercial could support linkage fees from \$7 to \$9 psf for retail, office, and hotel developments;
 - Industrial could support linkage fees up to \$6.00 psf; and
 - Commercial prototypes of 8 or more stories in high cost submarkets could absorb linkage fees up to \$11psf.

These results are displayed in Figure ES-1, on the following page.

⁵ https://www.denvergov.org/files/assets/public/housing-stability/documents/denver_r_nexus-study-final-090816.pdf

⁶ It is important to note that linkage fees are legally bound by the nexus study maximum justifiable fees but are not legally required to meet financial feasibility. The feasibility analysis is designed to provide additional and updated information to the City as one of many factors in evaluating policy changes.

**Figure ES-1.
Linkage Fee
Feasibility
Summary**

Source:
Root Policy Research.

Prototype	Max Justifiable Nexus Fee	Current Linkage Fee	Feasible Linkage Fee	
			Typical Submarket	High Cost Submarket
For-Sale Residential (low density)				
Single Unit Infill	\$9.60 / GSF	\$.65 / GSF	\$9.6 / GSF	n/a
Townhomes	\$15.45 / GSF	\$1.61 / GSF	\$14 / GSF	n/a
Commercial			\$7 / GSF	\$11 / GSF
Office under 8 stories	\$56.74 / GSF	\$1.83 / GSF	\$7 / GSF	n/a
Office over 8 stories	\$56.74 / GSF	\$1.83 / GSF	\$9 / GSF	\$11 / GSF
Hotel under 8 stories	\$83.02 / GSF	\$1.83 / GSF	\$9 / GSF	n/a
Hotel over 8 stories	\$83.02 / GSF	\$1.83 / GSF	\$9 / GSF	\$11 / GSF
Retail (1 story)	\$119.29 / GSF	\$1.83 / GSF	\$7 / GSF	n/a
Industrial			\$6 / GSF	n/a
1-Story Warehouse	\$28.51 / GSF	\$.43 / GSF	\$6 / GSF	n/a

Inclusionary Feasibility

- Inclusionary housing requires new residential development to include a portion of affordable housing units on-site and create mixed-income housing. Feasibility testing of an inclusionary housing option focuses on the production of on-site affordable units (as opposed to a fee in lieu), which means the following analysis only considers residential prototypes.
- Should the City elect to adopt an inclusionary housing policy, the policy would replace the linkage fee on new multifamily residential developments above a to-be-determined development threshold size.
- The financial feasibility analysis indicates several potential policy options for an inclusionary housing program that can generate units to better meet the City's affordability needs while maintaining target financial returns for developers. The results of this analysis provides findings given the current market conditions and do not account for natural market adjustments (e.g., changes in land costs and other development accommodations) following implementation of a policy that would likely over time increase feasibility beyond the requirements summarized below.
- Rental residential prototypes maintain financial feasibility thresholds under inclusionary housing policy with the following requirements:
 - 50% AMI: 5% of units in typical submarkets and 8% in high cost submarkets (50% AMI contract rent for a 1-bedroom is \$886);
 - 60% AMI: 8% of units in typical submarkets and 10% in high cost submarkets (60% AMI contract rent for a 1-bedroom is \$1,082);

- 70% AMI: 10% of units in typical submarkets and 12% in high cost submarkets (70% AMI contract rent for a 1-bedroom is \$1,279); and
- 80% AMI: 12% of units in typical submarkets and 15% in high cost submarkets (80% AMI contract rent for a 1-bedroom is \$1,476).

These results are displayed in Figure ES-2, below.

Figure ES-2.
Rental Residential
Inclusionary Feasibility
Summary

Source:
Root Policy Research.

% AMI	Feasible Inclusionary Requirement		Contract Rent for 1-bdrm at specified AMI
	Typical Submarket	High Cost Submarket	
Rental Residential			
50% AMI	5% of units	8% of units	\$886
60% AMI	8% of units	10% of units	\$1,082
70% AMI	10% of units	12% of units	\$1,279
80% AMI	12% of units	15% of units	\$1,476

- For-sale residential can absorb an inclusionary policy requiring 8% of units affordable to 60% AMI, 10% of units at 80% AMI, 12% of units at 100% AMI, or 15% of units affordable to 120% AMI while maintaining financial feasibility thresholds. In high-cost markets (high rise condos only), feasibility extends to 10% of units at 60% AMI, 12% of units at 80% AMI, 15% of units at 100% AMI, and 15% of units at 120% AMI. Note that for-sale programs commonly target higher AMIs than rental residential programs due to feasibility differences (e.g., differences in cost, margin, sale prices, outputs, etc.).

Figure ES-3.
For-Sale Residential
Inclusionary Feasibility
Summary

Note: Home price range accounts for higher HOA costs for condos; lower bound reflects condo price and upper bound is single family homes.

Source: Root Policy Research.

% AMI	Feasible Inclusionary Requirement		Home price for 2-person household at specified AMI
	Typical Submarket	High Cost Submarket (high rise condos)	
For-sale Residential			
60% AMI	8% of units	10% of units	\$188,500 - \$232,000
80% AMI	10% of units	12% of units	\$251,300 - \$309,300
100% AMI	12% of units	15% of units	\$314,100 - \$386,600
120% AMI	15% of units	15% of units	\$377,000 - \$463,900

SECTION I.

PROFORMA DEVELOPMENT AND ASSUMPTIONS

SECTION I.

Proforma Development and Assumptions

Financial Feasibility is based on proformas typically used in the real estate industry to determine whether a project is financially feasible. A proforma is comprised of a development budget (construction and other costs associated with building development), an estimate of income, and an estimate of project value based on project income at stabilization and its estimated value at sale.

This section describes the underlying assumptions of the proformas developed for the EHA financial feasibility analysis, including prototypes tested, development cost assumptions, and operation/valuation assumptions. The building costs modeled in the feasibility analysis assume moderate finishes, amenities, and building materials that command market rents (v. luxury, amenity-rich developments intended to capture the highest income renters and/or be master leased to corporate interests). It begins with a brief overview of Denver's development market.

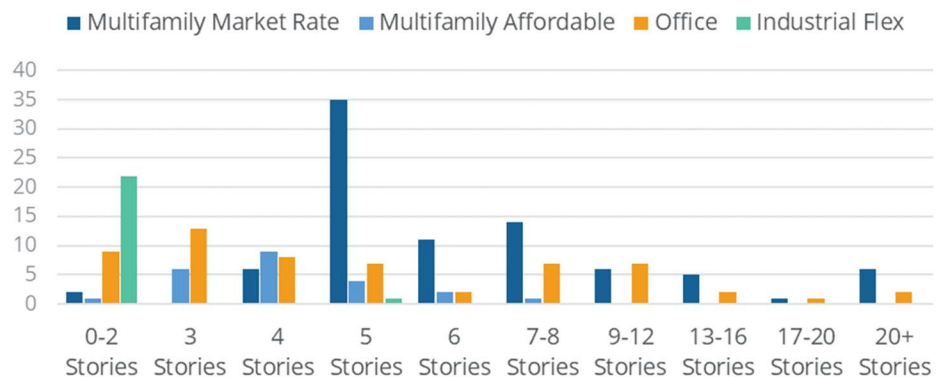
Denver Development Market Overview

Recent development market outcomes. A review of market rate (multifamily and commercial) development constructed from 2015 to 2019 within the City of Denver highlights several notable trends that provide context for the feasibility analysis.

Building Heights. Despite various zoning entitlements across the city, there is a notable clustering of buildings developed at the 5-story mark, except for areas in and near downtown and Cherry Creek (see Geographic Dispersion below). Of the 107 market rate rental developments built, 60 percent had 5 and fewer stories and 83 percent had 8 and fewer stories. Fully affordable multifamily developments, such as those financed with Low Income Housing Tax Credits (LIHTC) tend to have lower heights. This is driven by the amount of subsidy available for a given development and concerns about over-concentrating affordable rental units in any one location.

Figure I-1.
Building
Height by
Development
Type, 2015-
2019

Source:
Denver Assessor and
ArLand.



Market-rate multifamily projects built between 2015 and 2019 were (on average):

- Size: 195 units
- Height: Tended to cluster around 5 stories, although a few projects reached 25 to 34 stories
- Unit Mix: 1 bedroom tended to predominate the unit mixes, which averaged 26% studio, 50% 1-bedroom, 26% 2-bedroom, and 2% 2-bedroom.
- Average Effective Rents: Average effective rents, which include concessions, ranged from \$1.99 to \$2.43 per square foot. Average “asking” rents ranged higher to over \$3.00 per square foot.

From 2000 to 2019, the average unit sizes have decreased. This is in part due to the increase of “micro-unit” (units ranging from 360sf to 700sf) built in the past five years.

Rowhouses were the predominant multifamily for-sale type in the last five years. Average total values for both rowhouses and condos were above \$500,000 (between 2015-2019), although prices ranged from \$320,000 to over \$900,000. Rowhouses averaged 3 bedrooms while condominiums averaged 2 bedrooms. Rowhouses tended to be 3 stories in height.

Geographic Dispersion. Recent multifamily and commercial development has generally occurred in alignment with the Blueprint Denver growth strategy.¹ Multifamily and office projects are concentrated in the downtown core and adjacent neighborhoods. Maps of recent multifamily and commercial developments by type and size are included in Appendix A.

COVID impact on development. As the EHA feasibility analysis was beginning, the local and national economy faced an unprecedented challenge from the COVID-19 pandemic. To understand the potential short- and long-term effects of the pandemic on residential and commercial development, the consultant team conducted interviews with local developers, lenders, and architects and reviewed market data and national forecasts from a variety of sources.

Overall in the U.S., industry forecasts are relatively favorable for the multifamily industry, which is expected to recover faster than the commercial industry, where losses will vary considerably depending on use.

Short term impacts from COVID certainly increased uncertainty and created a lag in construction timing. Lumber prices spiked in 2020 due to interruptions in supply (mills temporarily closed early in the pandemic) coupled with extremely high demand in single

¹ For more on Blueprint Denver see <https://www.denvergov.org/content/denvergov/en/community-planning-and-development/planning-and-design/blueprint-denver.html>

family home construction and remodeling. This has had an acute impact on development costs for stick-built construction (fewer than 7 stories), though lumber prices are expected to moderate by end of 2021. Commercial and residential rents softened and residential concessions were up into early 2021. However, most forecasts indicate these trends to be relatively short term. At present cap rates and interest rates are low, which provides some relief to developer proformas.

Longer term,

- Investors are showing increased interest in the multifamily industry, given its relative safety compared to other industries;
- Overall, the multifamily market in Denver is expected to be relatively unaffected by the pandemic. However, developers will be sensitive to broader economic uncertainties.
- Office development remains uncertain and hotel development is likely to be the slowest market segment to return to pre-COVID activity levels.

Feasibility Model Development Prototypes

To ensure the recommended alternatives are feasible across a variety of development projects, the Model examines a range of prototypes across residential (for-sale and rental), office, hotel, retail and warehouse uses. The physical parameters of the development program for the prototypes used in the analysis are partially based on development prototypes used in the city's past Affordable Housing and Linkage Fee Study (David Paul Rosen & Associates, 2016) and 38th & Blake Station Area Incentive Height Overlay Feasibility Study (David Paul Rosen & Associates, 2017), which informed past policy initiatives, as well as an analysis of existing development projects in the City of Denver. The physical characteristics of development prototypes are shown in Figure I-2.

A note about parking: Parking assumptions range from .75 spaces per unit to 1.25 spaces per unit with a mix of surface, tuck under, structured, and underground spaces depending on building height and use. Though not shown in the base-case assumptions, sensitivity testing also evaluated higher parking ratios in suburban contexts (for low- and mid-rise prototypes). The parking assumptions are driven by market expectation and do not reflect potential parking reductions offered through the Denver Zoning Code or related incentives. The city is exploring additional parking reductions as incentives; however market-rate developers indicated in interviews that reductions are less desirable due to finance and marketability concerns. Should market-rate developers consider more significant parking reductions viable, this could substantially reduce the parking cost while increasing the total number of units. (See Appendix D for more detail on sensitivity testing of parking requirements).

Figure I-2.
Physical Characteristics of Development Prototypes

Prototype	Parcel Size (SF)	Gross Building SF (excl parking)	Ground Floor Retail SF	Unit/Room Count	Average Net Unit Size (SF)	Parking Ratio	Total Parking Spaces	Parking Mix
For-Sale Residential								
Single Unit Infill	5,250	2,700		1	2,570	2./Unit	2	single garage (100%)
Townhomes	18,000	21,700		10	1,950	1./Unit	10	single garage (100%)
5-Story Condo	43,560	128,900		95	1,015	1.25/Unit	119	structured (85%) and surface (15%)
12-Story Condo	43,560	302,900		233	975	1.25/Unit	291	structured (40%) and underground (60%)
Rental Residential								
3-Story	52,272	66,600		65	943	1./Unit	65	surface (100%)
5-Story	43,560	137,400		140	854	.9/Unit	126	structured (85%) and surface (15%)
8-Story	32,670	211,363	5,000	210	854	.75/Unit	158	structured (75%) and underground (25%)
12-Story	32,670	270,263	5,000	290	795	.75/Unit	218	structured (75%) and underground (25%)
16-Story	32,670	302,926	10,000	320	795	.75/Unit	240	structured (60%) and underground (40%)
20-Story	32,670	335,726	10,000	360	795	.75/Unit	270	structured (50%) and underground (50%)
Office								
3-Story Office	32,670	33,300				1.6/1,000 SF	53	surface (100%)
5-Story Office	32,670	62,200				1.6/1,000 SF	100	structured (35%) and underground (65%)
8-Story Office	32,670	153,063	5,000			1.6/1,000 SF	236	structured (25%) and underground (75%)
12-Story Office	32,670	173,363	5,000			1.6/1,000 SF	269	structured (15%) and underground (85%)
16-Story Office	32,670	266,363	5,000			1.6/1,000 SF	418	structured (15%) and underground (85%)
Other Commercial								
4-Story Hotel	87,120	66,700		143	350	.75/Room	107	surface (100%)
12-Story Hotel	43,560	109,700		235	350	.75/Room	176	tuck-under (33%), structured (33%), underground (34%)
1-Story Retail	43,560	10,500		0	0	7.9/1,000 SF	79	surface (100%)
1-Story Warehouse	348,480	100,000		0	0	.83/1,000 SF	83	surface (100%)

Note: Characteristics shown above reflect base-case assumptions; variations in parking requirements, parcel size, and bedroom mix were evaluated in sensitivity testing.

Source: Root Policy Research and ArLand Land Use Economics.

For multifamily residential prototypes, the bedroom mix varies by development height and is based on market data from developments constructed in the past five years in Denver.² Broadly speaking, as building height increases, the distribution shifts more toward studios and one-bedroom units. Figure I-3 shows bedroom mix assumptions for base-case prototypes (though variations in bedroom mix were also considered in sensitivity testing).

**Figure I-3.
Bedroom Mix
for Multifamily
Prototypes**

Source:
CoStar and Root Policy
Research.

Building Height	Bedroom Distribution				Num. of Units in Typical Prototype			
	Studio	1 BR	2 BR	3+ BR	Studio	1 BR	2 BR	3+ BR
3-Story	10%	48%	32%	10%	7	31	21	7
5-Story	17%	53%	26%	4%	24	74	37	5
8-Story	17%	53%	26%	4%	36	111	56	8
12-Story	28%	48%	22%	2%	82	140	64	5
16-Story	28%	48%	22%	2%	90	154	70	5
20-Story	28%	48%	22%	2%	101	174	79	6

For-sale condos (5-story and 12-story) have larger unit sizes and more bedrooms, on average, than rental residential developments. The condo prototype assumes the average unit is 2 bedrooms and 2 bathrooms; the townhome prototype assumes a unit with 3 bedrooms and 2 bathrooms. The single unit for sale prototype was modeled strictly on square footage as opposed to number of bedrooms.

Development Costs

Total development costs for each prototype include “hard” construction costs, “soft” construction costs (i.e., architectural and engineering, fees, permits, and other entitlement costs), land costs, and construction financing costs.

- **Hard costs.** Building costs are largely driven by structure height, which determines building materials and other requirements. Major cost increases occur at 8 stories (change in building type), 12 stories (additional smoke/fire requirements), and 20 stories (premiums in the façade, foundations, logistics/hoisting, HVAC, and availability of specialized labor). There are also minor cost increases in 3 to 4 stories (due to elevator requirement) and 4 to 5 stories (from concrete to podium ground floor).

Hard construction cost assumptions were based on interviews with developers, architects, and contractors active in the Denver market and supplemented with estimates provided by Marshall & Swift Commercial Cost Estimating software.

- Building costs (excluding parking) for multifamily residential range from \$197 per square foot (3-story development) to \$263 per square foot (20-story development). Condo building costs are higher per square foot than same-height rental residential due to differences in insurance costs (related to construction defects) and finish level. Townhomes are modeled at \$171

² CoStar Realty Information Inc.

per square foot. For commercial projects which ranged from a 1-story warehouse to a 12-story hotel, costs ranged from \$102 per square foot to \$309 per square foot. Tenant finish allowances were also assumed for office, retail, and industrial projects ranging from \$30 to \$80 per square foot.

- Parking costs are modeled separately and range from \$4,000 per space (surface parking) to \$45,000 per space (underground garage). Garage spaces (for single unit and townhomes) were assumed at \$30 per square foot.
- Other elements of hard costs include site preparation which can include demolition, grading, landscaping, pedestrian improvements, alley improvements, sewer upgrades, etc. assumed at 5% of building costs.
- **Soft costs.** Soft costs include design, engineering, consulting, and related professional fees, entitlement costs, taxes, insurance, legal, accounting, and project management—as well as fees paid to the developer. Soft costs also include development fees charged by the city, including Denver Water fees, as well as the existing affordable housing linkage fee.³ The typical ratio of soft costs to hard costs in the City of Denver (without the cost of financing) is approximately 18-21% (lower bound applies to low-density structures with reduced architectural fees).
- **Construction financing.** Construction financing periods ranged from 16 to 30 months, depending on the size and complexity of the prototype. We assumed an interest-only construction loan equal to 65% of hard and soft construction costs, an interest rate of 4.00%, and a 1.0% construction loan fee.
- **Contingency.** The Feasibility Model also accounts for contingency, modeled at 5% of development costs excluding land (hard cost + soft costs).

Hard, soft, and financing cost estimates (including a contingency) are provided for each prototype in Figure I-4. These costs do not include the cost of land.

³ Note that the existing linkage fee is modeled for base case market scenarios but different policy alternatives impact linkage fees in different ways. For example, changes to the linkage fee are evaluated in Section II. Linkage Fee Feasibility and in Section III, an inclusionary housing policy swaps the linkage fee for unit construction in residential prototypes.

Figure I-4.
Development Cost (Excluding Land) by Prototype

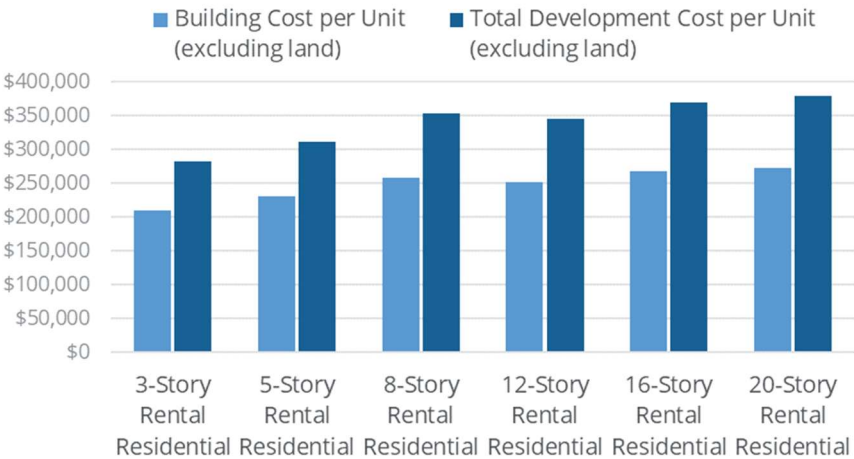
Prototype	Building Cost per Square Foot (excl. parking)	Parking Cost per Space				Tenant Improvements /Upgrades	Site Costs (as a % of Bldg Cost)	Soft Costs (excl. Linkage and Financing)	Linkage Fee (as of June 2021)	Contingency
		Surface	Tuck Under	Structured Garage	Under- ground					
For-Sale Residential										
Single Unit Infill	\$150 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	18% of HC	\$.65 per SF	5%
Townhomes	\$171 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	18% of HC	\$1.61 per SF	5%
5-Story	\$246 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	20% of HC	\$1.61 per SF	5%
12-Story	\$287 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	20% of HC	\$1.61 per SF	5%
Rental Residential										
3-Story	\$197 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	18% of HC	\$1.61 per SF	5%
5-Story	\$207 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	20% of HC	\$1.61 per SF	5%
8-Story	\$230 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	20% of HC	\$1.61 per SF	5%
12-Story	\$241 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	20% of HC	\$1.61 per SF	5%
16-Story	\$254 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	20% of HC	\$1.61 per SF	5%
20-Story	\$263 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	20% of HC	\$1.61 per SF	5%
Office										
3-Story Office	\$139 per SF	\$4,000	\$10,000	\$35,000	\$45,000	\$60 per NSF	5%	18% of HC	\$1.83 per SF	5%
5-Story Office	\$156 per SF	\$4,000	\$10,000	\$35,000	\$45,000	\$60 per NSF	5%	20% of HC	\$1.83 per SF	5%
8-Story Office	\$184 per SF	\$4,000	\$10,000	\$35,000	\$45,000	\$80 per NSF	5%	20% of HC	\$1.83 per SF	5%
12-Story Office	\$192 per SF	\$4,000	\$10,000	\$35,000	\$45,000	\$80 per NSF	5%	20% of HC	\$1.83 per SF	5%
16-Story Office	\$198 per SF	\$4,000	\$10,000	\$35,000	\$45,000	\$80 per NSF	5%	20% of HC	\$1.83 per SF	5%
Other Commercial										
4-Story Hotel	\$240 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	20% of HC	\$1.83 per SF	5%
12-Story Hotel	\$310 per SF	\$4,000	\$10,000	\$35,000	\$45,000		5%	20% of HC	\$1.83 per SF	5%
1-Story Retail	\$125 per SF	\$4,000	\$10,000	\$35,000	\$45,000	\$75 per NSF	5%	20% of HC	\$1.83 per SF	5%
1-Story Warehouse	\$103 per SF	\$4,000	\$10,000	\$35,000	\$45,000	\$30 per NSF	5%	20% of HC	\$.43 per SF	5%
Financing Assumptions All Prototypes	Construction Financing			Development Financing						
	Loan to Cost Ratio		65%	Presumed Equity		30%				
	Loan Fees		1.0%	Term (years)		30				
	Interest Rate		4.00%	Interest Rate		4.15%				

Source: Root Policy Research and ArLand Land Use Economics.

Figure I-5 shows the total development cost per unit excluding land costs for each rental residential prototype based on the assumptions outlined above. Under these assumptions, development cost per unit (excluding land cost) ranges from \$280,000 for a 3-story walkup to \$380,000 for a 20-story multifamily building. Building cost per unit, including parking, is also shown.

Figure I-5.
Per Unit Building
Cost and Per Unit
Development
Cost by Height—
Excluding Land

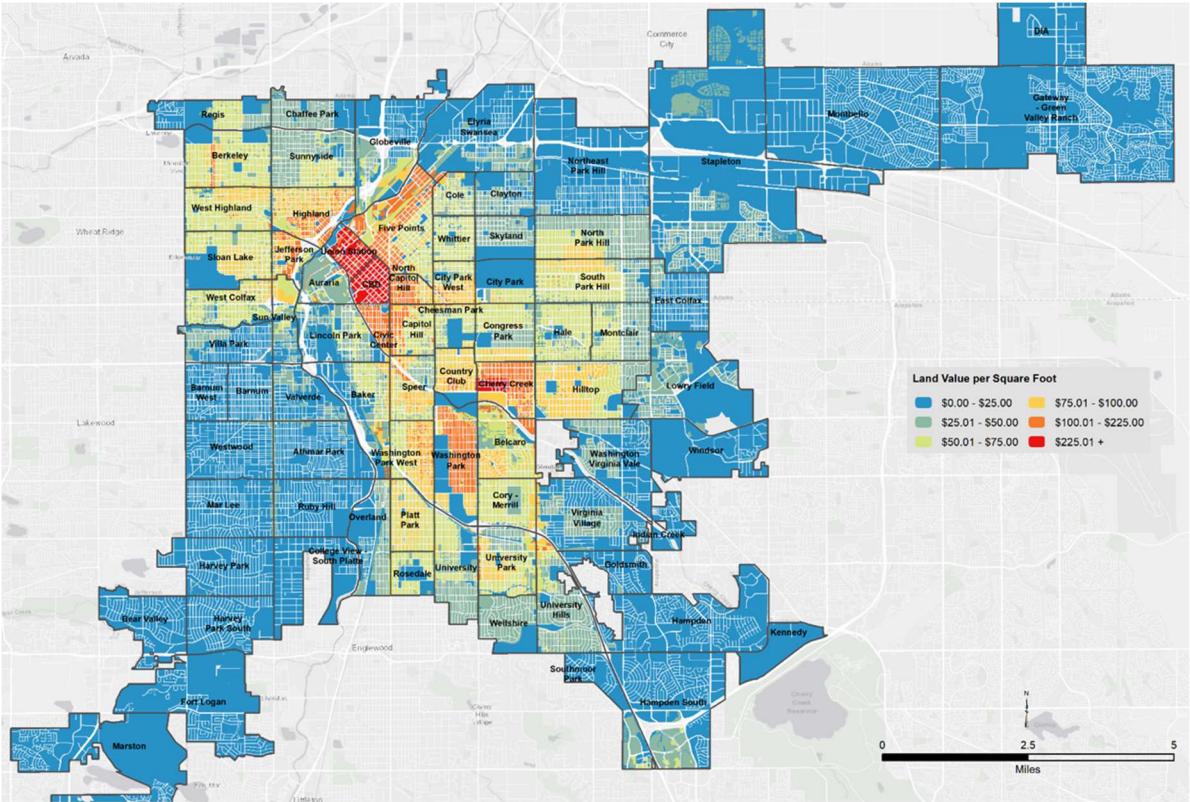
Source:
Root Policy Research and
ArLand Land Use Economics.



Land costs. Land costs vary widely throughout the city and are impacted by location, zoning entitlement, and site-specific characteristics. Figure I-6 shows land values throughout the city based on assessor data, to provide additional context for geographic variation of market areas. It is important to note that land value of all parcels (reflected in the figure) does not necessarily equate to land prices of parcels currently for sale.

Typical land costs in the Feasibility Model are higher than the assessor value ranges shown above. Land costs in the Model range from \$50 per square foot up to \$300 per square foot for residential and office prototypes. The sensitivity analysis also considers higher cost submarkets in which land costs were \$350 per square foot for high-rise buildings as well as low-cost suburban submarkets in which land costs reached as low as \$40 per square foot for 3-story developments. Land costs for low-density retail and warehouse uses were modeled at \$6 to \$18 per square foot.

Figure I-6.
Land Value by Parcel, Denver 2020



Source: Denver Assessor and ArLand.

Figure I-7 shows the range of land cost assumptions in the Feasibility model by market area and prototype.

Figure I-7.
Land Cost by Market Area

Source:
Root Policy Research.

Market Area		Land Cost
Low	Low Cost (low rise only <4 stories)	\$50 per Sq. Ft.
	Typical Cost, low to mid density (5-11 stories)	\$100 per Sq. Ft.
Mod	Typical Cost, high density (12+)	\$175 per Sq. Ft.
	High Cost, mid density)	\$250 per Sq. Ft.
High	High Cost area (high density, 12+)	\$300 per Sq. Ft.
	Warehouse and Single Story Retail	\$6-\$18 per Sq. Ft.
Sensitivity testing: Very low cost		\$40 per Sq. Ft.
Sensitivity testing: Very high cost		\$350 per Sq. Ft.

The modeling in subsequent sections presents feasibility in both “typical” submarkets and “high cost” submarkets. The typical submarket reflects low or moderate land costs, incorporating variation across prototypes. High cost submarkets reflect the high land costs outlined in the previous figure and include variation across prototypes. Low density prototypes are generally not feasible in high cost submarkets and are typically excluded

from the high cost sensitivity analysis. Figure I-8 shows land cost by submarket by prototype.

Figure I-8.
Land Value Area
where Prototypes are
Most Common

Source:
Root Policy Research.

Prototype	Typical Submarket Land Cost	High Cost Submarket Land Cost
For-Sale Residential		
Single Unit Infill	\$40 per SF	not feasible
Townhomes	\$50 per SF	not feasible
5-Story	\$100 per SF	not feasible
12-Story	\$175 per SF	\$300 per SF
Rental Residential		
3-Story	\$50 per SF	not feasible
5-Story	\$100 per SF	not feasible
8-Story	\$100 per SF	\$250 per SF
12-Story	\$175 per SF	\$300 per SF
16-Story	\$175 per SF	\$300 per SF
20-Story	\$175 per SF	\$300 per SF
Office		
3-Story Office	\$50 per SF	not feasible
5-Story Office	\$50 per SF	not feasible
8-Story Office	\$100 per SF	\$250 per SF
12-Story Office	\$175 per SF	\$300 per SF
16-Story Office	\$175 per SF	\$300 per SF
Other Commercial		
4-Story Hotel	\$100 per SF	\$250 per SF
12-Story Hotel	\$175 per SF	\$300 per SF
1-Story Retail	\$8 per SF	not feasible
1-Story Warehouse	\$8 per SF	not feasible

Operation and valuation assumptions. The proforma also calculates anticipated revenue, operating/sales expenses, and an estimate of project value based on project income at stabilization and its estimated value at sale. The Feasibility Model also incorporates financial feasibility measures such as Return on Cost, Return on Equity, Internal Rate of Return, and Cash on Cash Returns which are discussed further in a subsequent section.

For-sale product revenue and valuation. For-sale products assume a per-unit sale price of \$683,000 for townhomes, \$628,000 to \$695,000 for condos, and \$865,000 for single unit infill.⁴ The townhome prototype assumes a unit with 3 bedrooms and 2 bathrooms; the condo prototype assumes the average unit is 2 bedrooms and 2 bathrooms. Though condos are typically smaller than townhomes, the average sale price is

⁴ Pricing based on 2020 and 2021 data from ZONDA, adjusted for new construction of specified prototypes.

higher due to location and amenities of the typical 12-story condo project in Denver. Single family units are modeled as 2,600 square foot homes on a 5,250 square foot lot.

In a typical condo in urban contexts, parking spaces are sold separately with an assumed purchase price of \$20,000 per space in 12-story developments and \$10,000 per space in 5-story developments. The net project value of for-sale prototypes reflects total sales revenue less fees for marketing and cost of sales.

Rental product revenues, expenses, and valuation:

- **Operating revenue.** Operating revenue is driven by rental rates but also includes parking revenue (for structured and underground parking only) and miscellaneous revenue from various amenities (storage, bicycle parking, etc.). Market rate rents are based on market areas statistics provided by Apartment Appraisers & Consultants for developments built in the past five years with an assumed future appreciation of 1% per year by development occupancy. Residential and commercial rents both softened during the COVID-19 pandemic; however multifamily residential rents are forecasted to rebound by the end of 2021 (and grow rapidly thereafter) and office rents are forecasted to rebound by the end of 2022.⁵ Feasibility testing focuses on recovered rents given the reality that any inclusionary policies or linkage fee updates would not be implemented until 2022 at the earliest.

Estimated multifamily rents at stabilized occupancy range from \$2.34 per square foot to \$3.08 per square foot on average (depending on building height). In a typical 5-story development these per square foot rents translate to \$1,574 for studios, \$1,991 for 1-bedrooms, \$2,813 for 2-bedrooms, and \$3,555 for 3-bedrooms or larger.⁶

- **Operating expenses.** Operating expenses account for general management and operating costs (\$7,000-\$7,800 per unit for rental residential; \$13 per NSF for office; and 50% of gross income for hotels), marketing costs (2% of revenues), replacement reserves (\$200 per unit per year for rental residential and \$1 per NSF for commercial) and vacancy rates (5% for residential, higher for commercial).
- **Debt service.** Development financing assumes 30% equity in the project and is calculated with a 4.15% interest rate on a 30-year term. Debt service is typically the largest ongoing cost; in this analysis it accounts for 60% to 63% of the total annual operating costs.
- **Valuations.** The value of each rental prototype is determined by first calculating net operating income which is derived from gross operating income, minus operating expenses, a vacancy allowance (i.e., revenue loss for vacant units), and replacement

⁵ ULI Real Estate Economic Forecast, 2021 and Cushman & Wakefield, Talent on the Move: Where People Live and Work After COVID-19 (available online at: www.cushmanwakefield.com/en/united-states/insights/talent-on-the-move-where-people-live-and-work-after-covid-19)

⁶ During the COVID-19 pandemic, landlords are offering substantial concessions for new leases. The model assumes stabilized concessions to reflect more accurate long-term market trends.

reserves. Net operating income is then divided by a capitalization rate (“cap rate”) which moves up and down depending on market dynamics. Cap rates are a popular measure through which real estate investments are assessed for their profitability and return potential. Our analysis assumes cap rates at 5.0% for multifamily and a range of 5.5% to 7.25% for non-residential prototypes (based on stakeholder feedback and market information).

Figure I-9 summarizes operating and sale assumptions across prototypes; additional details, including estimated revenues and expenses by prototype are shown in the Appendix.

Figure I-9.
Operating Revenue and Expense Assumptions by Prototype

Prototype	REVENUE				EXPENSES				CAP RATE
	Rate Rent or Sale Price (2021 \$)		Parking Revenue (structured and underground only)	Misc. Revenue	Vacancy Rate	Operating Expenses	Replacement Reserves	Marketing/ Cost of Sales (% of revenues)	
For-Sale Residential									
Single Unit Infill	\$865,000							1%	n/a
Townhomes	\$683,000							2%	n/a
5-Story	\$628,000		\$10,000					2%	n/a
12-Story	\$695,000		\$20,000					2%	n/a
Rental Residential									
3-Story	\$2.34 / SF	\$2,207 / Unit	\$150 per Spc/Mo	\$20 / Unit	5%	\$7,073 / Unit	\$200 / Unit	2%	5.0%
5-Story	\$2.57 / SF	\$2,195 / Unit	\$150 per Spc/Mo	\$50 / Unit	5%	\$7,046 / Unit	\$200 / Unit	2%	5.0%
8-Story	\$2.66 / SF	\$2,272 / Unit	\$150 per Spc/Mo	\$75 / Unit	5%	\$7,259 / Unit	\$200 / Unit	2%	5.0%
12-Story	\$2.89 / SF	\$2,298 / Unit	\$150 per Spc/Mo	\$80 / Unit	5%	\$7,553 / Unit	\$200 / Unit	2%	5.0%
16-Story	\$3.03 / SF	\$2,409 / Unit	\$150 per Spc/Mo	\$80 / Unit	5%	\$7,751 / Unit	\$200 / Unit	2%	5.0%
20-Story	\$3.08 / SF	\$2,449 / Unit	\$150 per Spc/Mo	\$80 / Unit	5%	\$7,751 / Unit	\$200 / Unit	2%	5.0%
Office									
3-Story Office	\$37.25 / SF		\$50 per Spc/Mo	\$.2/NSF	7%	\$13/NSF	\$1./NSF	2%	5.75%
5-Story Office	\$41.05 / SF		\$50 per Spc/Mo	\$.35/NSF	7%	\$13/NSF	\$1./NSF	2%	5.75%
8-Story Office	\$44.55 / SF		\$50 per Spc/Mo	\$.35/NSF	7%	\$13/NSF	\$1./NSF	2%	5.75%
12-Story Office	\$46.80 / SF		\$50 per Spc/Mo	\$.35/NSF	7%	\$13/NSF	\$1./NSF	2%	5.75%
16-Story Office	\$47.15 / SF		\$50 per Spc/Mo	\$.35/NSF	7%	\$13/NSF	\$1./NSF	2%	5.75%
Other Commercial									
4-Story Hotel	\$175 ADR			\$13./NSF	28%	50% of GI	\$1./NSF	2%	7.25%
12-Story Hotel	\$215 ADR			\$13./NSF	28%	50% of GI	\$1./NSF	2%	7.25%
1-Story Retail	\$41.50 / SF				15%	\$13/NSF	\$1./NSF	2%	5.5%
1-Story Warehouse	\$16.70 / SF				4%	\$3/NSF	\$.25/NSF	2%	5.5%

Note: *Market-rate rents vary by unit/bedroom size; the average for the overall development is shown in the figure.

Source: Root Policy Research and ArLand Land Use Economics.

How do affordable requirements and incentives impact project feasibility?

- When affordable unit construction is required in rental developments, the income restricted units reduce the potential net operating income (though the per-unit cost of constructing affordable units and operating them is typically the same as market-rate units). In a for-sale context, affordable units reduce the expected sale revenue.
- When a linkage fee (or fee-in-lieu) is required, initial development costs (and therefore ongoing debt service) increase due to the fee, but revenue continues to reflect market-rate potential.
- When height incentives are offered in exchange for affordable units, the total development cost increases with the increased height while net operating income (or sale revenue) per unit declines (as a result of the income-restricted units). However, that decline is partially offset by the overall increase in the number of market-rate units (resulting from the height bonus).
- Changes in development cost per unit with a height bonus vary according to building types and codes. When the increased height results in a new construction type (for example going from wood-frame construction to steel/concrete), the cost per unit increases. However, if the height bonus adds units without changing the construction type, cost per unit will decline.

Feasibility and Desirability Metrics

The financial feasibility analysis evaluates whether a development meets target financial measures typically used in the real estate industry. These measures help describe whether a project is economically viable.

In order to be considered “feasible,” the development must meet financial feasibility targets under the base-case scenario and under the affordability alternative scenario (linkage fee, inclusionary, or incentive). For a voluntary incentive program to be successful, it must also provide added benefit to the developer in the form of higher project values and profits relative to the base-case development. This added benefit is referred to below as “desirability” and/or “attractiveness.”

Feasibility metrics. Feasibility is evaluated across several financial measures typically used in the real estate industry including Return on Costs (ROC), Cash on Cash return (COC), Internal Rate of Return (IRR), and Return on Equity (ROE). The target value of each metric is based on industry standards and stakeholder consultation. Broadly speaking, ROC and COC measure near term returns while IRR and ROE reflect longer-term returns. A development must meet minimum targets on at least one short term feasibility measure (ROC or COC) and on one long-term feasibility measure (IRR or ROE) to be considered

financially feasible for the purpose of the EHA alternative evaluation.⁷ The only exception is for-sale residential (for which a long-term hold is not calculated)—in these cases the development must meet both the ROC and COC targets.

Technical definitions of each measure are specified below, along with the feasibility targets for each metric. Though each metric reflects a slightly different perspective on project returns, critical pro forma factors in each are net operating income, project value (or market value), total development cost, and debt service on the development.

- **Return on Costs:** Calculated by dividing net operating income by total development costs including land (for rental residential and commercial prototypes). On for-sale residential, return on costs is calculated by dividing project returns by net project value, and incorporating the total development costs of the project (including land). Return expectations are typically evaluated relative to cap rates and vary by prototype. Current market threshold returns are 5.5% on rental residential, 6.5% on for-sale residential, 7% on hotel, and 6% on office and other commercial.
- **Cash on Cash Return:** Calculated by dividing an assumed equity amount equivalent to 30% of the costs of the project by the net returns generated by the project (stabilized net operating income minus debt service). Based on interviews, we have assumed that at least 6% return is necessary in order to meet the project's threshold financial requirements for rental residential and for commercial prototypes. Interviews indicate that return expectations are higher for for-sale residential properties (12%).
- **Internal Rate of Return:** Calculated by assuming an equity amount equivalent to 30% of the cost of the project; calculating a net income for approximately 7 years and a sale at the end of that period (net of principal payback on development loan). The IRR is an estimate of annualized returns for that time period which is a measure typically used by shorter term investors and holders. Based on interviews, not all developers use this metric, but when they use it, a 10% return is their threshold return. Many analyses incorporate inflation and discount rates in order to calculate future cash flows. In order to simplify and assuming that inflation and discount rates are equivalent, our analysis assumes future cash flows in 2021 dollars.⁸
- **Return on Equity:** Calculated by dividing the cash flow (including debt service but before tax) by the amount of cash invested. It incorporates a calculation of the cash repaid to investors annually, so in later years, the return increases relative to the amount initially invested. In this analysis, we have incorporated the return of Year 5 of the development project with a target threshold of 6%. As in the IRR calculation, we

⁷ It should be noted that developments that have a high project value and approach feasibility targets—or meet some targets but not others—may still be attractive depending on developer/investor business models and goals but are not considered feasible or desirable in the Feasibility Model.

⁸ A previous iteration of the report used an unleveraged version of the IRR calculation. The current IRR calculation has been adjusted to net out the loan principal from the sale price in year 7. The target threshold has also been adjusted accordingly.

have assumed that future cash flows are in 2021 dollars. Our analysis conservatively does not incorporate potential increases in project valuations.

Incentive desirability. In addition to meeting the baseline financial feasibility targets, a voluntary incentive program must also demonstrate some level of “attractiveness” to market-rate developers. Desirability of incentive alternatives was quantified through changes in nominal project values and nominal profit after accounting for affordability requirements. Increases in project value and profit were considered desirable (contingent on the incentivized development also meeting financial feasibility targets).

A note about returns and investors:

It is important to note that developers are typically reliant on investors or investor groups to provide capital for development. As such, investor priorities and expectations of returns are a primary driver of development activity (what gets built, where it gets built, and for which target market). Different investors want different things: some prioritize a long-term hold, vs a short-term sale; some are strictly profit-driven, while others are mission-oriented (e.g., sustainability, place-making, affordability, etc.). Risk tolerance also varies widely—and impacts expected returns (with higher “risk” developments commanding higher returns). Market alternatives also impact investor expectations, including different geographic markets as well as different real estate categories (residential vs office vs industrial vs retail).

Base Market Rate Development Feasibility

The first step in feasibility testing is to evaluate market-rate developments without an incentive or affordability requirements. The Model demonstrates baseline feasibility across prototypes in “moderate” submarkets—areas with land costs in the moderate range for the specified development type. As discussed earlier in this section, low density structures typically occur on lower priced submarkets while high density structures occur in higher priced submarkets (see Figure I-7).

Figure I-10 summarizes proforma results and feasibility metrics of market-rate developments (without any affordability requirements or incentives) to illustrate base-case feasibility. The figures show key project outcomes in both typical and high cost submarkets. The high cost analysis evaluates outcomes with and without a rent premium (rent premiums are common in high cost markets; see Appendix A for details).

It should be noted that developments that have a high project value and approach feasibility targets—or meet some targets but not others—may still be attractive depending on developer/investor business models and goals.

Figure I-10.
Financial Feasibility of Base-Case Market-Rate Developments

Key Project Outcomes		For-Sale Residential				Rental Residential						Office					Hotel		Other	
		Single Unit Infill	Town-homes	5-Story Condo	12-Story Condo	3-Story Rental Residential	5-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	3-Story Office	5-Story Office	8-Story Office	12-Story Office	16-Story Office	4-Story Hotel	12-Story Hotel	1-Story Retail	1-Story Warehouse
Development Summary																				
Building Stories		2	3	5	12	3	5	8	12	16	20	3	5	8	12	16	4	12	1	1
Total Building GSF (excl. parking)		2,700	21,700	128,900	302,900	66,600	137,400	211,363	270,263	302,926	335,726	32,600	60,900	149,863	169,663	260,663	66,700	109,700	10,500	100,000
Total Residential units (or hotel rooms)		1	10	95	233	65	140	210	290	320	360	0	0	0	0	0	143	235	0	0
Typical Submarket (Low land cost for <3 Stories and Moderate land cost for 4+ stories)																				
Development Summary																				
Total Development Cost		\$760,810	\$5,992,728	\$52,693,152	\$143,552,214	\$20,567,290	\$47,936,649	\$77,551,939	\$105,932,051	\$124,177,348	\$142,251,396	\$10,313,115	\$23,976,162	\$67,901,123	\$81,493,400	\$125,754,921	\$31,096,853	\$61,608,895	\$3,525,134	\$20,855,117
Development cost per SF		\$282	\$276	\$326	\$361	\$309	\$278	\$295	\$311	\$326	\$336	\$316	\$259	\$302	\$319	\$320	\$466	\$369	\$336	\$209
Development cost per unit		\$760,810	\$599,273	\$554,665	\$616,104	\$316,420	\$342,405	\$369,295	\$365,283	\$388,054	\$395,143	n/a	n/a	n/a	n/a	n/a	\$217,461	\$262,166	n/a	n/a
Net Operating Inc (NOI) or Res Sales Revenue		\$865,000	\$6,830,000	\$60,669,375	\$167,760,000	\$1,177,213	\$2,751,440	\$4,439,791	\$6,102,880	\$7,183,325	\$8,214,624	\$626,355	\$1,430,472	\$4,019,485	\$4,861,720	\$7,525,600	\$2,476,849	\$4,842,322	\$212,750	\$1,264,025
Annual Net Cash Flow (after debt svc)						\$337,395	\$794,058	\$1,273,138	\$1,777,391	\$2,112,831	\$2,406,119	\$205,243	\$451,461	\$1,246,900	\$1,534,126	\$2,390,690	\$1,207,082	\$2,326,666	\$68,809	\$412,455
Feasibility Summary		Target																		
Return on Cost	>5.5-7%	12.6%	11.7%	12.8%	14.5%	5.7%	5.7%	5.7%	5.8%	5.8%	5.8%	6.1%	6.0%	5.9%	6.0%	6.0%	8.0%	7.9%	6.0%	6.1%
Cash on Cash Return	>6%-15%	41.9%	39.0%	25.7%	24.2%	5.5%	5.5%	5.5%	5.6%	5.7%	5.6%	6.6%	6.3%	6.1%	6.3%	6.3%	12.9%	12.6%	6.5%	6.6%
IRR (7-year hold)	>=10%					12.5%	12.6%	12.5%	12.8%	13.0%	12.9%	11.0%	10.1%	9.7%	10.1%	10.3%	17.1%	16.5%	12.0%	12.2%
Return on Equity (Year 5)	>6%					7.0%	7.1%	7.0%	7.2%	7.3%	7.3%	9.0%	8.4%	8.1%	8.4%	8.5%	26.8%	25.4%	8.8%	9.0%
High Land Cost Area (no rent premium)																				
Development Summary																				
Total Development Cost				\$148,997,214				\$80,818,939	\$110,015,801	\$128,261,098	\$146,335,146			\$71,168,123	\$85,577,150	\$129,838,671		\$67,053,895		
Development cost per SF				\$375				\$308	\$323	\$337	\$346			\$316	\$335	\$330		\$402		
Development cost per unit				\$639,473				\$384,852	\$379,365	\$400,816	\$406,487			n/a	n/a	n/a		\$285,336		
Annual Net Operating Income				\$167,760,000				\$4,439,791	\$6,102,880	\$7,183,325	\$8,214,624			\$4,019,485	\$4,861,720	\$7,525,600		\$4,842,322		
Annual Net Cash Flow (after debt svc)								\$1,139,737	\$1,610,640	\$1,946,081	\$2,239,368			\$1,113,500	\$1,367,376	\$2,223,939		\$2,104,332		
Feasibility Summary		Target																		
Return on Cost	>5.5-7%			10.3%				5.4%	5.5%	5.6%	5.6%			5.6%	5.7%	5.8%		7.2%		
Cash on Cash Return	>6%-15%			17.2%				4.7%	4.9%	5.1%	5.1%			5.2%	5.3%	5.7%		10.5%		
IRR (7-year hold)	>=10%							10.7%	11.1%	11.6%	11.7%			7.4%	7.7%	8.7%		12.3%		
Return on Equity (Year 5)	>6%							5.8%	6.1%	6.3%	6.4%			6.6%	6.8%	7.4%		18.0%		
High Land Cost Area (5% rent premium)																				
Development Summary																				
Total Development Cost				\$148,997,214				\$80,818,939	\$110,015,801	\$128,261,098	\$146,335,146			\$71,168,123	\$85,577,150	\$129,838,671		\$67,053,895		
Development cost per SF				\$375				\$308	\$323	\$337	\$346			\$316	\$335	\$330		\$402		
Development cost per unit				\$639,473				\$384,852	\$379,365	\$400,816	\$406,487			n/a	n/a	n/a		\$285,336		
Annual Net Operating Income				\$175,856,750				\$4,711,706	\$6,482,665	\$7,622,699	\$8,717,077			\$4,295,153	\$5,191,048	\$8,041,109		\$5,049,790		
Annual Net Cash Flow (after debt svc)								\$1,411,653	\$1,990,425	\$2,385,455	\$2,741,821			\$1,389,168	\$1,696,703	\$2,739,448		\$2,311,800		
Feasibility Summary		Target																		
Return on Cost	>5.5-7%			15.7%				5.8%	5.9%	5.9%	6.0%			6.0%	6.1%	6.2%		7.5%		
Cash on Cash Return	>6%-15%			26.1%				5.8%	6.0%	6.2%	6.2%			6.5%	6.6%	7.0%		11.5%		
IRR (7-year hold)	>=10%							13.3%	13.8%	14.2%	14.3%			10.7%	10.9%	11.9%		14.4%		
Return on Equity (Year 5)	>6%							7.6%	7.9%	8.2%	8.3%			8.8%	9.0%	9.8%		21.3%		

Note: Assumes recovered rents (post-COVID). Developments less than 8 stories are not considered in high cost markets. Since for-sale products are not assumed to be held by the developer, feasibility metrics focus on return on cost (ROC) and cash on cash (COC).

Source: Root Policy Research.

SECTION II.

LINKAGE FEE FEASIBILITY ANALYSIS

SECTION II.

Linkage Fee Feasibility Analysis

The linkage fee analysis measures the financial feasibility of adding incremental linkage fee amounts to a base-case development budget for each prototype by measuring the change in feasibility metrics. This section begins with a brief overview of the existing linkage fee system in Denver then evaluates feasibility of increases to the current fee. The feasibility analysis focuses on nonresidential linkage fees and low-density residential (single unit and townhomes) as large-scale residential developments would be exempt from linkage fees under an inclusionary housing system (see Section III).

Linkage Fee Background: 2016 Nexus & Feasibility Study

The City of Denver instituted a linkage fee on new residential and commercial development in 2017, the revenue from which supports Denver's affordable housing fund. Linkage fees are one-time fees imposed on new development and are designed to offset the impact of new development on low wage job creation, which in turn creates demand for affordable housing.

Linkage fees are bound by the quantifiable "impact" of development on a community's need for affordable housing. Prior to implementing the current linkage fee, the City contracted with David Paul Rosen and Associates (in 2016) to conduct a Nexus Study to calculate the maximum legally justifiable nexus fee by land use (derived from the number of low and moderate income households) associated with various types of development.

Figure II-1 shows the results of the 2016 nexus study: maximum justifiable linkage fees and economically feasible fees for residential and nonresidential developments by type.

- Legally justified fees range from \$9.60 per square foot on single-family residential development to \$119.29 per square foot on stand-alone retail development, including a variety of residential and commercial prototypes evaluated with legally justified fees within that range. The summary table can be found on page 3 of the 2016 report conducted by DR&A.
- The feasibility analysis examined the effect of the nexus fee from \$1.00 per square foot to \$7.00 per square foot. The study examined Return on Equity (ROE), Return of Cost (ROC) and Residual Land Value (RLV). The analysis indicated that a fees of \$6.00 to \$7.00 per square foot would have a relatively small effect on returns.

Though the City is legally justified in assessing the maximum fees, the City elected to assess fees well below the legally justifiable amount and the amount determined to be financially feasible. Current fees, as of June 2021, (also shown in Figure II-1) are between 1% and 10% of the legally justifiable fees.

**Figure II-1.
Maximum
Justifiable
Linkage Fees
According to
2016 Nexus
Study**

Source:

Denver Affordable Housing
Nexus Study 2016, conducted
by David Paul Rosen and
Associates (results
reformatted to match figure
style of this report).

Prototype Description	Maximum Justifiable Nexus Fee (per GSF)	2016 Economically Feasible Nexus Fees (per GSF)	Current Fee Schedule, 2021 (per GSF)	Current Fee as a % of Max Justifiable Fee
Residential Prototypes				
Single-Family Infill	\$9.60	\$6.00	\$0.65	7%
Owner Townhome	\$15.45	\$6.00	\$1.61	10%
12-Story Owner	\$18.52	\$6.00	\$1.61	9%
5-Story Rental	\$16.02	\$7.00	\$1.61	10%
20-Story Rental	\$19.44	\$7.00	\$1.61	8%
Non-Residential Prototypes				
Office	\$56.74	\$7.00	\$1.83	3%
Hotel	\$83.02	\$7.00	\$1.83	2%
Retail	\$119.29	\$7.00	\$1.83	2%
Warehouse	\$28.51	\$7.00	\$1.83	6%
Manufacturing	\$29.57	\$7.00	\$0.43	1%

Overview of Modeling Approach

To conduct the financial feasibility analysis, Root used the base-case financial feasibility (discussed in Section I) then added incremental new fee amounts to the development budget for each prototype and measured the changes by calculating the actual change in financial feasibility metrics including Return on Cost (ROC), Return on Equity (ROE), Internal Rate of Return (IRR), and Cash on Cash (COC).

Root tested fees from \$2 per square foot (psf) to \$15 psf in single dollar increments under typical market conditions. Root also tested fees up to \$11 for mid- and high-rise products in high cost submarkets (with an assumed rent premium).¹ All baseline prototype assumptions (configuration, cost, revenue, etc.) match the assumptions discussion in Section I.

What are the differences between “typical” and “high cost” submarkets?

Submarkets are discussed in detail in Section I of this report. Broadly speaking, “typical” submarkets reflect low land cost assumptions for prototypes under 3 stories and moderate land cost for 4 or more stories. Specifically, typical land cost for residential and commercial development under 4 stories is \$50 per square foot (psf), typical for 5-11 stories is \$100 psf, and typical for 12+ story development is \$175 psf. High cost submarkets only apply to mid and high rise developments. In high cost submarkets, land is modeled at \$250 psf for mid-rise and \$300 psf for high rise. High cost markets for residential and commercial prototypes also command higher market rents, modeled at 5% above typical market rents. Warehouse and single story retail have lower land costs, modeled at \$7 psf for typical submarkets and \$18 in high cost submarkets; no rent increase is assumed in high cost markets for these prototypes.

¹ Mid- and high-rise developments exceed 7 stories. Refer to Section I for additional details on typical and high cost submarkets or see summary in call out box below.

Figures II-2 and II-3 summarize feasibility of linkage fee increases in typical and high cost submarkets. Outputs falling short of feasibility thresholds are shaded orange. As discussed in Section I, projects must meet a minimum of one short-term output (ROC or COC) and one long-term output (IRR or ROE) to be considered feasible. Full pro formas for the highest feasible fees are in Appendix B.

Figure II-2. Affordable Housing Linkage Fee Impacts to Financial Feasibility in Typical Submarkets

Prototype	Metric Target	Current Linkage				\$6 Linkage					\$7 Linkage					\$8 Linkage					\$9 Linkage				
		ROC >6-7%	COC >6%	IRR >10%	ROE >6%	ROC 7%	COC >6%	IRR >10%	ROE >6%	Result	ROC 7%	COC >6%	IRR >10%	ROE >6%	Result	ROC >6-7%	COC >6%	IRR >10%	ROE >6%	Result	ROC >6-7%	COC >6%	IRR >10%	ROE >6%	Result
Office																									
3-Story Office		6.1%	6.6%	11.0%	9.0%	6.0%	6.3%	10.3%	8.5%	✓	6.0%	6.3%	10.1%	8.4%	✓	5.9%	6.1%	10.0%	8.3%	✓	5.9%	5.9%	9.8%	8.2%	✗
5-Story Office		6.0%	6.3%	10.1%	8.4%	5.9%	6.1%	9.6%	8.0%	✓	5.9%	6.0%	9.4%	7.9%	✓	5.9%	5.9%	9.3%	7.8%	✗	5.9%	5.9%	9.2%	7.7%	✗
8-Story Office		5.9%	6.1%	9.7%	8.1%	5.9%	6.0%	9.3%	7.8%	✓	5.8%	5.9%	9.1%	7.7%	✗	5.8%	5.8%	9.0%	7.6%	✗	5.8%	5.8%	8.9%	7.5%	✗
12-Story Office		6.0%	6.3%	10.1%	8.4%	5.9%	6.1%	9.7%	8.0%	✓	5.9%	6.0%	9.5%	8.0%	✓	5.9%	6.0%	9.4%	7.9%	✓	5.9%	6.0%	9.3%	7.8%	✓
16-Story Office		6.0%	6.3%	10.3%	8.5%	5.9%	6.1%	9.8%	8.2%	✓	5.9%	6.1%	9.7%	8.1%	✓	5.9%	6.1%	9.6%	8.0%	✓	5.9%	6.0%	9.5%	7.9%	✓
Other Commercial																									
4-Story Hotel		8.0%	12.9%	17.1%	26.8%	7.9%	12.7%	16.7%	25.7%	✓	7.9%	12.6%	16.6%	25.5%	✓	7.9%	12.6%	16.5%	25.3%	✓	7.8%	12.5%	16.3%	25.0%	✓
12-Story Hotel		7.9%	12.6%	16.5%	25.4%	7.8%	12.4%	16.1%	24.5%	✓	7.8%	12.3%	16.0%	24.3%	✓	7.8%	12.3%	15.9%	24.1%	✓	7.8%	12.2%	15.8%	23.9%	✓
1-Story Retail		6.0%	6.5%	12.0%	8.8%	6.0%	6.2%	11.4%	8.3%	✓	5.9%	6.2%	11.3%	8.2%	✓	5.9%	6.1%	11.1%	8.1%	✗	5.9%	6.1%	11.0%	8.0%	✗
1-Story Warehouse		6.1%	6.6%	12.2%	9.0%	5.9%	6.0%	10.9%	8.0%	✓	5.9%	5.9%	10.7%	7.8%	✗	5.8%	5.8%	10.5%	7.6%	✗	5.8%	5.7%	10.2%	7.5%	✗
Prototype	Metric Target	Current		\$6 Linkage			\$8 Linkage			\$9 Linkage			\$10 Linkage			\$12 Linkage			\$14 Linkage			\$15 Linkage			
		ROC >6.5%	COC >12%	ROC >6.5%	COC >12%	Result	ROC >6.5%	COC >12%	Result	ROC >6.5%	COC >12%	Result	ROC >6.5%	COC >12%	Result	ROC >6.5%	COC >12%	Result	ROC >6.5%	COC >12%	Result	ROC >6.5%	COC >12%	Result	
For-Sale Residential																									
Single Unit Infill		12.6%	41.9%	10.3%	34.4%	✓	9.5%	31.7%	✓	9.1%	30.3%	✓	8.7%	29.0%	✓	n/a; exceeds maximum justifiable nexus									
Townhomes		11.7%	39.0%	9.8%	32.7%	✓	9.0%	29.9%	✓	8.6%	28.5%	✓	8.2%	27.2%	✓	7.3%	24.5%	✓	6.5%	21.8%	✓	6.1%	20.5%	✗	

Notes/Source: see Figure II-3.

Figure II-3. Affordable Housing Linkage Fee Impacts to Financial Feasibility in High Cost Submarkets

Prototype	Metric Target	Current Linkage				\$8 Linkage					\$9 Linkage					\$10 Linkage					\$11 Linkage				
		ROC >6-7%	COC >6%	IRR >10%	ROE >6%	ROC 7%	COC >6%	IRR >10%	ROE >6%	Result	ROC 7%	COC >6%	IRR >10%	ROE >6%	Result	ROC >6-7%	COC >6%	IRR >10%	ROE >6%	Result	ROC >6-7%	COC >6%	IRR >10%	ROE >6%	Result
Office																									
8-Story Office		6.0%	6.5%	10.7%	8.8%	6.0%	6.2%	10.0%	8.3%	✓	5.9%	6.1%	9.9%	8.2%	✓	5.9%	6.0%	9.8%	8.1%	✓	5.9%	5.9%	9.7%	8.1%	✗
12-Story Office		6.1%	6.6%	10.9%	9.0%	6.0%	6.3%	10.3%	8.5%	✓	6.0%	6.3%	10.2%	8.4%	✓	6.0%	6.3%	10.1%	8.3%	✓	5.9%	6.2%	10.0%	8.3%	✓
16-Story Office		6.2%	7.0%	11.9%	9.8%	6.1%	6.8%	11.2%	9.3%	✓	6.1%	6.7%	11.1%	9.2%	✓	6.1%	6.7%	11.0%	9.1%	✓	6.1%	6.6%	10.9%	9.0%	✓
Other Commercial																									
12-Story Hotel		7.5%	11.5%	14.4%	21.3%	7.4%	11.2%	13.9%	20.3%	✓	7.4%	11.2%	13.8%	20.2%	✓	7.4%	11.1%	13.7%	20.1%	✓	7.4%	11.1%	13.6%	19.9%	✓

Note: Current linkage based on fee schedule in June 2021. ROC is return on cost; COC is cash on cash return; IRR is internal rate of return with a 7-year hold; ROE is return on equity at year 5. Target thresholds shown under each metric. For detailed explanation of submarkets see call out box on previous page or Section I. High cost submarkets assume a 5% rent premium.

Source: Root Policy Research.

Linkage Feasibility Results

Figure II-4 summarizes the maximum financially feasible linkage fee by prototype based on the results of the previous figures. Maximum justifiable nexus fees (based on the 2016 DRA study) and current linkage fees are included for reference. Results show that across most prototypes, linkage fees could be increased (sometime by as much as 3-4x) and remain financially feasible.

- **Low density residential linkage fees:** Linkage fees of up to the legally defensible maximum of \$9.6 per square foot on single unit infill would meet financial feasibility thresholds. For townhomes, linkage fees up to \$14 per square foot would meet financial feasibility thresholds.
- **Commercial linkage fees:** Linkage fees ranging from \$7 to \$9 per square foot for office, hotel and retail developments would maintain overall financial feasibility.² An important consideration, however, is the impacts of coronavirus on these markets, which have been the hardest hit by the pandemic. While the analysis has incorporated some impacts of the economic downturn, many of these development projects remain on an indefinite hold. As such, development of these uses is likely to be limited over the next several years, regardless of potential changes to the linkage fee.
- **Industrial linkage fees:** Linkage fees of up to \$6 per square foot for industrial development would meet financial feasibility thresholds.
- **High cost submarkets:** For mid- and high-rise developments (8 stories or more) in high cost submarkets, linkage fees could be increased to \$11 per square foot and still achieve feasibility thresholds.²

² The 8-story office prototype only supported a \$6 linkage fee in typical submarkets and a \$10 linkage fee in high cost submarkets; however, as discussed in Section I, 8-story developments are some of the most challenging to “pencil” even without additional fees. As such, this prototype should not be the driving determinant of policy changes.

**Figure II-4.
Financially
Feasible
Linkage Fees**

Source:
Root Policy Research.

Prototype	Max Justifiable Nexus Fee	Current Linkage Fee	Feasible Linkage Fee	
			Typical Submarket	High Cost Submarket (with rent escalation)
For-Sale Residential				
Single Unit Infill	\$9.60 / GSF	\$.65 / GSF	\$9.6 / GSF	n/a
Townhomes	\$15.45 / GSF	\$1.61 / GSF	\$14 / GSF	n/a
Office				
3-Story Office	\$56.74 / GSF	\$1.83 / GSF	\$8 / GSF	n/a
5-Story Office	\$56.74 / GSF	\$1.83 / GSF	\$7 / GSF	n/a
8-Story Office	\$56.74 / GSF	\$1.83 / GSF	\$6 / GSF	\$10 / GSF
12-Story Office	\$56.74 / GSF	\$1.83 / GSF	\$9 / GSF	\$11 / GSF
16-Story Office	\$56.74 / GSF	\$1.83 / GSF	\$9 / GSF	\$11 / GSF
Other Commercial				
4-Story Hotel	\$83.02 / GSF	\$1.83 / GSF	\$9 / GSF	n/a
12-Story Hotel	\$83.02 / GSF	\$1.83 / GSF	\$9 / GSF	\$11 / GSF
1-Story Retail	\$119.29 / GSF	\$1.83 / GSF	\$7 / GSF	n/a
1-Story Warehouse	\$28.51 / GSF	\$.43 / GSF	\$6 / GSF	n/a

Figure II-5 calculates project impacts of implementing the feasible linkage fees across prototypes in typical submarkets. Impacts are illustrated through percent change in key total development cost, project margin (on for-sale residential), and annual net cash flow (on commercial) resulting from the higher linkage fee from current fee levels.

**Figure II-5.
Project Impacts of
Feasible Linkage
in Typical
Submarket**

Note:
Total development cost includes land cost. Project margin is Sales Revenue minus marketing costs and total development costs. Annual net cash flow is NOI minus annual debt service.

Source:
Root Policy Research.

Prototype	Feasible Linkage Fee, Typical Submarket	Percent Change from Current to Feasible	
		Total development cost	Project Margin or Annual net cash flow
For-Sale Residential		Project Margin	
Single Unit Infill	\$9.6 / SF	3.4%	-27.0%
Townhomes	\$14 / SF	4.8%	-41.3%
Office		Net Cash Flow	
3-Story Office	\$8 / SF	2.1%	-4.5%
5-Story Office	\$7 / SF	1.7%	-3.6%
8-Story Office	\$6 / SF	1.0%	-2.2%
12-Story Office	\$9 / SF	1.6%	-3.5%
16-Story Office	\$9 / SF	1.6%	-3.5%
Other Commercial		Net Cash Flow	
4-Story Hotel	\$9 / SF	1.7%	-1.7%
12-Story Hotel	\$9 / SF	1.4%	-1.4%
1-Story Retail	\$7 / SF	1.7%	-3.6%
1-Story Warehouse	\$6 / SF	2.9%	-5.9%

Conclusion

As illustrated by the financial feasibility analysis, linkage fees across all prototypes could be increased and still hit the key feasibility thresholds:

- Single unit infill could support linkage fees up to \$9.60 psf;
- Townhomes could support linkage fees up to \$14 psf;
- Commercial could support linkage fees from \$7 to \$9 psf for retail, office, and hotel developments;
- Industrial could support linkage fees up to \$6.00 psf; and
- Prototypes of 8 or more stories in high cost submarkets could absorb linkage fees of up to \$11psf.

SECTION III.

INCLUSIONARY HOUSING FEASIBILITY ANALYSIS

SECTION III.

Inclusionary Housing Feasibility Analysis

Inclusionary housing requires new residential development to include a portion of affordable housing units on-site and create mixed-income housing. Feasibility testing of an inclusionary housing option focuses on the production of on-site affordable units (as opposed to a fee-in-lieu), which means the following analysis only considers residential prototypes.¹

Should the City elect to adopt an inclusionary housing policy, the policy would replace the linkage fee on new multifamily residential developments above a to-be-determined development threshold size, while commercial prototypes, single family residential, and small multifamily residential properties below the threshold would continue to pay a fee under the linkage system.²

Background on Inclusionary Housing

Prior to the City's adoption of the current linkage fee system in 2017, the city had an Inclusionary Housing Ordinance (IHO) from 2001 until 2016 to facilitate homeownership opportunities for moderate income households. Due to state law limitations at the time, the program only applied to owner occupied development.

Generally, the former IHO required for-sale projects over 30 units to restrict a minimum of 10% of its units to households with incomes between 50% and 95% AMI depending on household size and type of unit constructed, and price those units accordingly. Most of the units required a minimum income restriction of 15 years. Developers were provided with financial incentives including a cash subsidy, parking reductions and density bonuses to partially offset the financial burden of selling units at a reduced price.

Additional details on the former IHO program including outcomes and lessons learned are detailed in the Expanding Housing Affordability [Background Report](#).

Given the recent changes in state law with the passage of [House Bill 21-1117](#)³, the City plans to implement a new inclusionary housing policy that would apply to both rental and for-sale multifamily developments once adopted⁴. The remainder of this section is devoted to

¹ Some residential prototypes do include ground floor retail.

² See Section II for feasibility analysis of changes to the linkage system.

³ HB-1117 allows communities across the state to require affordable housing on all new housing (including rental and ownership). The bill does include some guard rails to the regulation by requiring that a "choice of options" are provided. It also requires that local governments demonstrate its commitment to "increase the number the overall number and density of housing units... or create incentives to the construction of affordable housing units."

⁴ See the project website for project timing and upcoming information on effective date.

identifying and evaluating the economic feasibility of a variety of potential program requirements.

Overview of Modeling Approach

The modeling evaluated feasibility across a wide range of affordability requirements that varied both by breadth (percent of units required to be affordable) and depth (level of affordability achieved measured relative to AMI):⁵

- The “affordability requirement” reflects the proportion of total units in the development that are required to have an income qualification. Feasibility testing ranged from 5% up to 20% of all units.
- The “AMI target” refers to the level of affordability required among those income qualified units. The Feasibility Model allows for a mix of AMI targets or a single target for all affordable units and testing ranged from 30% AMI up to 80% AMI for rental residential and from 50% AMI up to 120% AMI for for-sale residential.

All affordable units are assumed to have the same bedroom mix and amenity level as market rate units in the same development. This consistent with the City’s affordable housing rules and regulations.⁶

Given the City’s requirement that all income restricted units remain restricted for a minimum of 60 years, and often up to 99 years, it should be noted that feasibility in Root’s analysis is not affected by affordability term (the length of time a unit is required to be rent-restricted), as 7-years is the longest hold period evaluated in the output metrics. In other words, financial feasibility of an inclusionary housing policy is the same whether the affordability term is 60 years or 99 years.

Affordable housing rent and price limits. Gross rent limits by AMI are set annually by the U.S. Department of Housing and Urban Development (HUD) along with income limits, which determine income eligibility for a variety of HUD programs as well as state and local housing/service programs. “Affordable” rents refer to rents that are income restricted and require no more than 30% of a household’s gross income. Income limits vary by metro area and by household size; rent limits vary by unit size (based on the number of people anticipated to occupy the unit).

The HUD-published rent limits include anticipated utilities so the contract rent amounts must be adjusted down to exclude utilities. The rent maximums shown in Figure III-1 show contract

⁵ The model can also examine the use of incentives such as cash subsidy and increased density and that the findings will be released as a supplement to this report at a later date.

⁶ https://www.denvergov.org/content/denvergov/en/denver-development-services/help-me-find-/Development-Services-updates/affordable_housing_fee.html

rents adjusted to account for utility allowances, based on the utility allowance standards published by the Housing Authority of the City and County of Denver.⁷

**Figure III-1.
2021 Contract Rent
Limits**

Note:

Rent limits by bedroom roughly translate to household sizes that allow up to 2 people per bedroom.

Source:

Rent limits from Colorado Housing and Finance Authority (CHFA); utility adjustments from Denver Housing Authority.

PERCENT OF AMI	2021 MAXIMUM CONTRACT RENTS				
	Studio (1 per hh)	1 Bedroom (1-2 per hh)	2 Bedroom (3-4 per hh)	3 Bedroom (5-6 per hh)	4 Bedroom (7-8 per hh)
120% AMI	\$2,119	\$2,262	\$2,711	\$3,117	\$3,464
100% AMI	\$1,752	\$1,869	\$2,239	\$2,572	\$2,856
80% AMI	\$1,385	\$1,476	\$1,767	\$2,027	\$2,248
70% AMI	\$1,201	\$1,279	\$1,531	\$1,754	\$1,944
60% AMI	\$1,018	\$1,082	\$1,295	\$1,482	\$1,640
55% AMI	\$926	\$984	\$1,177	\$1,345	\$1,488
50% AMI	\$834	\$886	\$1,059	\$1,209	\$1,336
45% AMI	\$742	\$787	\$941	\$1,073	\$1,184
40% AMI	\$651	\$689	\$823	\$937	\$1,032
30% AMI	\$467	\$492	\$587	\$664	\$728
20% AMI	\$284	\$296	\$351	\$392	\$424

Figure III-2 shows rent limits at 60% AMI and 80% AMI compared to new construction market-rate rents by building height and number of bedrooms in both typical submarkets and high cost submarkets. As discussed in Section I, high cost submarkets have higher land costs but also command higher rents, modeled at a 5% premium over new development rents in a typical submarket.

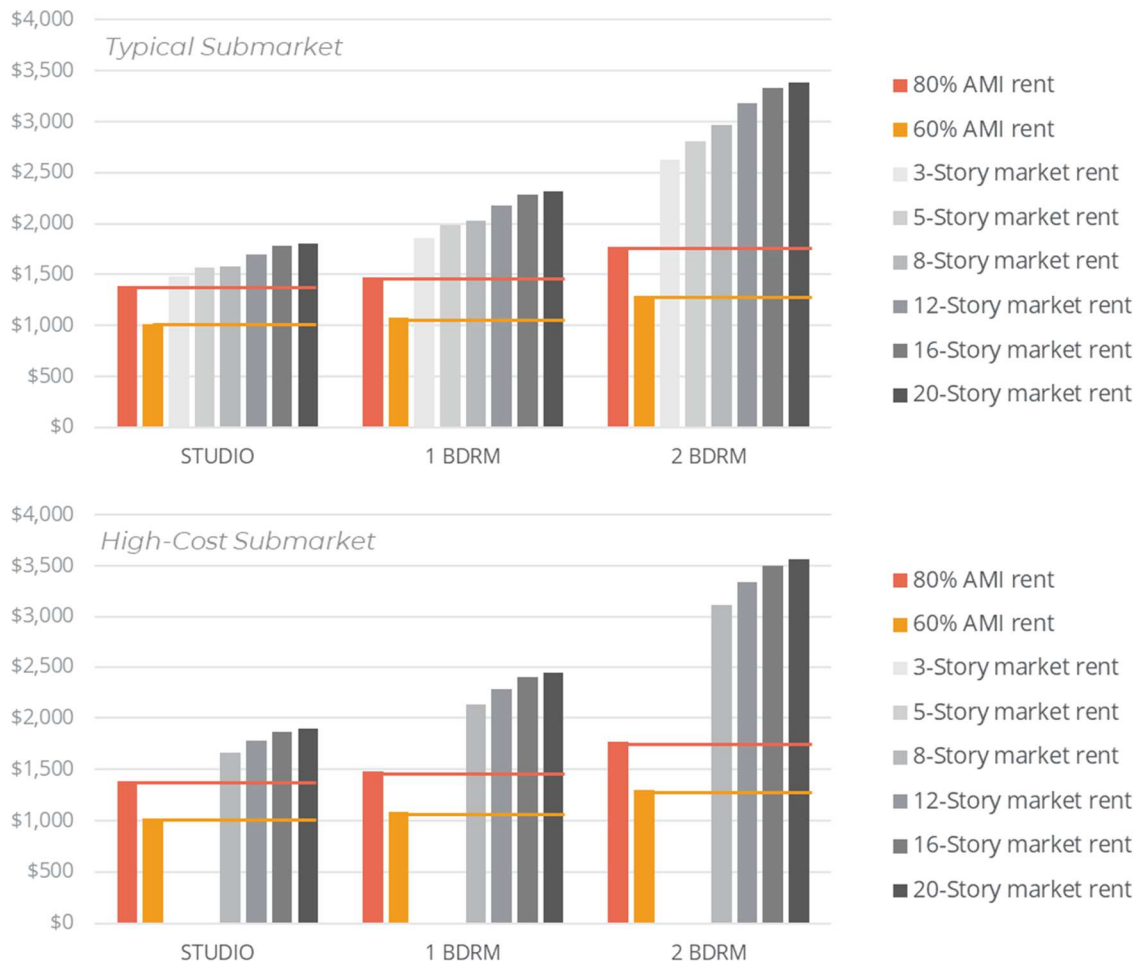
As illustrated, the gap between affordable rent limits and market rents increases with increasing building height and number of bedrooms. Also, while market-rate rents vary by submarket, affordable rents are consistent throughout the City.

- In a typical market area, a 1-bedroom at 60% AMI rents reflect a discount of \$780 to \$1,240 per unit per month from market-rates and a two-bedroom at 60% AMI is discounted by \$1,340 to \$2,090 per unit per month from market-rates.
- At 80% AMI, 1-bedroom rents reflect a discount of \$385 to \$845 per unit per month from market-rates (in a typical submarket) and a two-bedroom at 60% AMI is discounted by \$865 to \$1,600 per unit per month from market-rates.
- The gap between market-rates and affordable rents widens in high-cost submarkets where a 1-bedroom is discounted \$1,050-\$1,355 at 60% AMI and \$660-\$960 at 80% AMI, compared to market-rate rents. Two-bedroom discounts are \$1,820-\$2,260 at 60% AMI and \$1,350-\$1,790 at 80% AMI.

⁷ Available at <http://www.denverhousing.org/LWU/section8/Documents/Utility%20Allowance%20Sheet%20%201%201%202021%20with%2010%201%202020%20Payment%20Standards.pdf>

These differences (or “discounts”) reflect direct reductions in monthly operating revenue for rental residential developments.

Figure III-2.
Market-Rate Rents and Affordable Rent Limits by Bedroom and Building Height



Note: High cost markets only applicable to mid- and high-rise structures (exceeding 7 stories).

Source: CHFA and Root Policy Research.

Though not shown in the figure, market-rate rents in the rental prototypes range from 100% to 190% AMI:

- In a typical market area, the market-rate rent for a 1-bedroom is naturally affordable to households earning 100% to 124% AMI (depending on building height). In a high cost market area, the market-rate rent for a 1-bedroom is naturally affordable to households earning 114% to 130% AMI.
- Market rate rents for two-bedrooms range from 118% to 151% AMI in typical submarkets and from 139% to 159% AMI in high cost submarkets.

- Market rate rents for three-bedrooms range from 131% to 181% AMI in typical submarkets and from 167% to 190% AMI in high cost submarkets. (See Appendix A for additional details on market-rate rents by AMI).

Figure III-3 shows for-sale price limits by AMI. Affordable purchase prices assume a 10% down payment on a 30-year fixed rate mortgage with 4.00% interest. Non-mortgage housing costs, including property taxes, utilities, insurance, etc. are assumed to account for about 20% of total monthly housing costs for single units and townhomes and about 35% for condos (to account for higher HOA fees). Feasibility modeling assumes a 2-person household size for condos, a 3-person household for townhomes, and a 4-person household size for the single unit prototype.

Market-rate sale prices modeled in the feasibility analysis equate to affordability for 157% AMI for the townhome prototype (priced at \$683,000), 179% AMI for the single-unit prototype (priced at \$840,000), 199% AMI for the 5-story condo prototype (priced at \$628,000) and 220% AMI for the high rise condo prototype (priced at \$95,000).

Figure III-3.
2021 Max Affordable
Home Price by AMI

Note:

Assumes 10% down on 30-year fixed mortgage at 4.00% interest. 20% of monthly housing costs assumed to be non-mortgage expenses.

Source:

US Department of Housing and Urban Development and Root Policy Research.

PERCENT OF AMI	2021 MAXIMUM AFFORDABLE HOME PRICE				
	Condo Price		Townhome and Single Family Price		
	1-Person HH	2-Person HH	3-Person HH	4-Person HH	5-Person HH
150% AMI	\$412,228	\$471,197	\$652,514	\$724,401	\$782,463
120% AMI	\$329,782	\$376,958	\$522,011	\$579,521	\$625,971
100% AMI	\$274,818	\$314,132	\$435,009	\$482,934	\$521,642
80% AMI	\$219,855	\$251,305	\$348,007	\$386,347	\$417,314
70% AMI	\$192,373	\$219,892	\$304,506	\$338,054	\$365,150
60% AMI	\$164,891	\$188,479	\$261,005	\$289,760	\$312,985
55% AMI	\$151,150	\$172,772	\$239,255	\$265,614	\$286,903
50% AMI	\$137,409	\$157,066	\$217,505	\$241,467	\$260,821
45% AMI	\$123,668	\$141,359	\$195,754	\$217,320	\$234,739
40% AMI	\$109,927	\$125,653	\$174,004	\$193,174	\$208,657
30% AMI	\$82,446	\$94,239	\$130,503	\$144,880	\$156,493
20% AMI	\$54,964	\$62,826	\$87,002	\$96,587	\$104,328

Linkage fees. Base case feasibility in Section I assumed current (2021) linkage fee amounts. For the inclusionary housing feasibility analysis, linkage fees on residential prototypes are not applied as a result of providing the prescribed affordable units.

Inclusionary Housing Feasibility Results

Feasibility results are summarized below. Alternatives are evaluated in both typical and high-cost sub-markets, though it is most common for low-rise developments (under 8 stories) to occur in typical cost sub-markets and for high rise developments (12+ stories) to occur in high-cost submarkets.

As discussed in Section I, projects must meet a minimum of one short-term output (ROC or COC) and one long-term output (IRR or ROE) to be considered financially feasible. Long-term outputs do not apply to for-sale residential prototypes so those must meet both ROC and COC to be considered feasible.

A note about market adjustments to affordability requirements:

As with all regulatory and market-driven changes, local development economics would have to adjust should an affordability requirement be imposed via inclusionary housing. These adjustments commonly include shifts in land values. Additionally, construction labor costs, development amenities or finish level, unit size/configuration, market-rate rents, and/or investor expectations may also shift in response to new requirements. Academic research on the impact of inclusionary requirements is mixed but generally shows no impact on housing supply and little to no impact on housing market pricing. In other words, in most cases, inclusionary does not slow development but it could result in marginal increases to market rate rents.⁸ Such impacts are not modeled in this feasibility analysis though the market responses outlined above would generally contribute to increased feasibility of inclusionary requirements.

Figures III-4 through III-7 display feasibility results, organized by AMI target of affordable units and by prototype. Orange shading indicates the output metric falls below the feasibility threshold. Note that AMIs presented throughout this section reflect an average AMI target—any mix of AMIs that achieve, on average, the specified affordability level would be feasible.

Results are shown for the following inclusionary scenarios (in both typical submarkets and high-cost submarkets):

- Rental residential results (Figures III-4 – III-7) are shown for the following percentage of units and AMI levels:
 - 5%, 8%, and 10% of units at 50% AMI;
 - 5%, 8%, 10%, 12%, and 15% of units at 60% AMI;

⁸ Economics of Inclusionary Housing Policies: Effects on Housing Prices, Grounded Solutions Network, 2016. Available online at: https://inclusionaryhousing.org/wp-content/uploads/2016/09/Economics-of-Inclusionary-Housing-Policies-Effects-on-Housing-Prices_a.pdf

- 5%, 8%, 10%, 12%, and 15% of units at 70% AMI and
- 10%, 12%, 15%, 18%, and 20% of units at 80% AMI.

Root also tested variations at 30% AMI but the percent of units feasible was very low. In addition, a 30% AMI target poses challenges for leveraging private development and does not prioritize the need/funding gap identified in the Housing Market Analysis (HOST dedicates substantial resource to 30% AMI but there are fewer resources dedicated to the identified need at 60% to 80% AMI). Should additional significant subsidy be offered, it could be possible to provide units at a lower AMI level or greater proportion of overall units.

- For-sale residential results (Figure III-8) are shown for the following percentage of units and AMI levels:
 - 5%, 8%, 10%, and 12% of units at 60% AMI;
 - 8%, 10%, and 12% of units at 70% AMI;
 - 10%, 12% and 15% of units at 80% AMI;
 - 10%, 12%, 15%, and 18% of units at 100% AMI; and
 - 12%, 15%, 18%, and 20% of units at 120% AMI.

**Figure III-4.
Inclusionary
Housing
Feasibility at
50% AMI,
Rental
Residential**

Note:

Orange shading indicates output that falls below feasibility threshold.

Green checks indicate financial feasibility for specified affordability target and prototype.

High Cost Submarket includes 5% price premium on market-rate units and sale prices.

Source:

Root Policy Research.

		Typical Submarket						High Cost Submarket			
Return Metric	Target	3-Story Rental	5-Story Rental	8-Story Rental	12-Story Rental	16-Story Rental	20-Story Rental	8-Story Rental	12-Story Rental	16-Story Rental	20-Story Rental
		Residential	Residential	Residential	Residential	Residential	Residential	Residential	Residential	Residential	Residential
No Inclusionary; Current Linkage only											
Return on Cost	>5.5%	5.7%	5.7%	5.7%	5.8%	5.8%	5.8%	5.8%	5.9%	5.9%	6.0%
Cash on Cash Return	>6%	5.5%	5.5%	5.5%	5.6%	5.7%	5.6%	5.8%	6.0%	6.2%	6.2%
Internal Rate of Return	>=10%	12.5%	12.6%	12.5%	12.8%	13.0%	12.9%	13.3%	13.8%	14.2%	14.3%
ROE (year 5)	>6%	7.0%	7.1%	7.0%	7.2%	7.3%	7.3%	7.6%	7.9%	8.2%	8.3%
Affordable Income Target of 50% AMI											
5% @ 50% AMI		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Return on Cost	>5.5%	5.5%	5.6%	5.5%	5.6%	5.6%	5.6%	5.6%	5.7%	5.7%	5.7%
Cash on Cash Return	>6%	4.8%	4.9%	4.9%	4.9%	5.0%	5.0%	5.2%	5.4%	5.5%	5.5%
Internal Rate of Return	>=10%	11.0%	11.2%	11.1%	11.3%	11.4%	11.3%	11.9%	12.3%	12.6%	12.7%
ROE (year 5)	>6%	6.0%	6.1%	6.0%	6.2%	6.3%	6.2%	6.5%	6.8%	7.1%	7.1%
8% @ 50% AMI		✗	✗	✗	✗	✓	✗	✓	✓	✓	✓
Return on Cost	>5.5%	5.4%	5.4%	5.4%	5.4%	5.5%	5.4%	5.5%	5.6%	5.6%	5.6%
Cash on Cash Return	>6%	4.4%	4.5%	4.4%	4.5%	4.6%	4.5%	4.7%	4.9%	5.0%	5.1%
Internal Rate of Return	>=10%	9.9%	10.2%	10.1%	10.2%	10.4%	10.2%	10.8%	11.2%	11.5%	11.6%
ROE (year 5)	>6%	5.3%	5.5%	5.4%	5.5%	5.6%	5.5%	5.9%	6.1%	6.3%	6.4%
10% @ 50% AMI		✗	✗	✗	✗	✗	✗	✗	✓	✓	✓
Return on Cost	>5.5%	5.3%	5.3%	5.3%	5.3%	5.4%	5.3%	5.4%	5.5%	5.5%	5.5%
Cash on Cash Return	>6%	4.1%	4.2%	4.2%	4.2%	4.3%	4.2%	4.5%	4.6%	4.7%	4.8%
Internal Rate of Return	>=10%	9.1%	9.4%	9.3%	9.5%	9.6%	9.5%	10.1%	10.4%	10.8%	10.8%
ROE (year 5)	>6%	4.9%	5.1%	5.0%	5.1%	5.1%	5.1%	5.4%	5.6%	5.8%	5.9%

**Figure III-5.
Inclusionary
Housing
Feasibility at
60% AMI,
Rental
Residential**

Note:

Orange shading indicates output that falls below feasibility threshold.

Green checks indicate financial feasibility for specified affordability target and prototype.

High Cost Submarket includes 5% price premium on market-rate units and sale prices.

Source:

Root Policy Research.

		Typical Submarket						High Cost Submarket			
		3-Story Rental Residential	5-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential
Return Metric	Target										
Affordable Income Target of 60% AMI											
5% @ 60% AMI		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Return on Cost	>5.5%	5.6%	5.6%	5.6%	5.6%	5.6%	5.6%	5.7%	5.7%	5.8%	5.8%
Cash on Cash Return	>6%	5.0%	5.0%	5.0%	5.1%	5.1%	5.1%	5.3%	5.5%	5.6%	5.6%
Internal Rate of Return	>=10%	11.3%	11.5%	11.4%	11.5%	11.7%	11.6%	12.1%	12.5%	12.8%	12.9%
ROE (year 5)	>6%	6.2%	6.3%	6.2%	6.3%	6.4%	6.4%	6.7%	7.0%	7.2%	7.3%
8% @ 60% AMI		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Return on Cost	>5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.6%	5.6%	5.6%	5.6%
Cash on Cash Return	>6%	4.6%	4.7%	4.6%	4.7%	4.7%	4.7%	4.9%	5.1%	5.2%	5.2%
Internal Rate of Return	>=10%	10.4%	10.6%	10.5%	10.6%	10.8%	10.6%	11.2%	11.6%	11.9%	11.9%
ROE (year 5)	>6%	5.6%	5.7%	5.7%	5.8%	5.8%	5.8%	6.1%	6.3%	6.6%	6.6%
10% @ 60% AMI		✗	✗	✗	✗	✗	✗	✓	✓	✓	✓
Return on Cost	>5.5%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.5%	5.5%	5.6%	5.6%
Cash on Cash Return	>6%	4.3%	4.4%	4.4%	4.4%	4.5%	4.4%	4.7%	4.8%	4.9%	4.9%
Internal Rate of Return	>=10%	9.8%	10.0%	9.9%	10.0%	10.1%	10.0%	10.6%	10.9%	11.2%	11.3%
ROE (year 5)	>6%	5.3%	5.4%	5.3%	5.4%	5.4%	5.4%	5.7%	5.9%	6.1%	6.2%
12% @ 60% AMI		✗	✗	✗	✗	✗	✗	✗	✗	✓	✓
Return on Cost	>5.5%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.4%	5.4%	5.5%	5.5%
Cash on Cash Return	>6%	4.1%	4.2%	4.1%	4.2%	4.2%	4.2%	4.4%	4.5%	4.7%	4.7%
Internal Rate of Return	>=10%	9.2%	9.4%	9.3%	9.4%	9.5%	9.3%	10.0%	10.3%	10.6%	10.6%
ROE (year 5)	>6%	4.9%	5.1%	5.0%	5.0%	5.1%	5.0%	5.4%	5.5%	5.7%	5.7%
15% @ 60% AMI		✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Return on Cost	>5.5%	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%	5.3%	5.3%	5.4%	5.4%
Cash on Cash Return	>6%	3.7%	3.8%	3.8%	3.8%	3.8%	3.8%	4.0%	4.1%	4.2%	4.3%
Internal Rate of Return	>=10%	8.2%	8.5%	8.4%	8.4%	8.4%	8.3%	9.0%	9.3%	9.5%	9.6%
ROE (year 5)	>6%	4.4%	4.5%	4.5%	4.5%	4.5%	4.4%	4.8%	5.0%	5.1%	5.1%

**Figure III-6.
Inclusionary
Housing
Feasibility at
70% AMI,
Rental
Residential**

Note:

Orange shading indicates output that falls below feasibility threshold.

Green checks indicate financial feasibility for specified affordability target and prototype.

High Cost Submarket includes 5% price premium on market-rate units and sale prices.

Source:

Root Policy Research.

		Typical Submarket						High Cost Submarket			
		3-Story Rental Residential	5-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential
Return Metric	Target										
Affordable Income Target of 70% AMI											
5% @ 70% AMI		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Return on Cost	>5.5%	5.6%	5.6%	5.6%	5.6%	5.6%	5.6%	5.7%	5.8%	5.8%	5.8%
Cash on Cash Return	>6%	5.1%	5.1%	5.1%	5.2%	5.2%	5.2%	5.4%	5.6%	5.7%	5.7%
Internal Rate of Return	>=10%	11.6%	11.8%	11.6%	11.8%	11.9%	11.8%	12.3%	12.7%	13.1%	13.1%
ROE (year 5)	>6%	6.4%	6.5%	6.4%	6.5%	6.6%	6.5%	6.9%	7.1%	7.4%	7.4%
8% @ 70% AMI		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Return on Cost	>5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.6%	5.7%	5.7%	5.7%
Cash on Cash Return	>6%	4.8%	4.9%	4.8%	4.9%	4.9%	4.8%	5.1%	5.2%	5.3%	5.4%
Internal Rate of Return	>=10%	10.9%	11.1%	10.9%	11.1%	11.1%	11.0%	11.6%	12.0%	12.2%	12.3%
ROE (year 5)	>6%	5.9%	6.0%	5.9%	6.0%	6.1%	6.0%	6.4%	6.6%	6.8%	6.8%
10% @ 70% AMI		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Return on Cost	>5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.6%	5.6%	5.6%
Cash on Cash Return	>6%	4.6%	4.7%	4.6%	4.6%	4.7%	4.6%	4.9%	5.0%	5.1%	5.1%
Internal Rate of Return	>=10%	10.5%	10.6%	10.4%	10.6%	10.6%	10.5%	11.1%	11.4%	11.7%	11.8%
ROE (year 5)	>6%	5.7%	5.7%	5.6%	5.7%	5.7%	5.7%	6.1%	6.3%	6.4%	6.5%
12% @ 70% AMI		✗	✗	✗	✗	✗	✗	✓	✓	✓	✓
Return on Cost	>5.5%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.5%	5.5%	5.5%	5.6%
Cash on Cash Return	>6%	4.4%	4.5%	4.4%	4.4%	4.5%	4.4%	4.7%	4.8%	4.9%	4.9%
Internal Rate of Return	>=10%	10.0%	10.2%	10.0%	10.0%	10.1%	9.9%	10.6%	10.9%	11.1%	11.2%
ROE (year 5)	>6%	5.4%	5.5%	5.3%	5.4%	5.4%	5.3%	5.7%	5.9%	6.1%	6.1%
15% @ 70% AMI		✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Return on Cost	>5.5%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.4%	5.4%	5.4%	5.4%
Cash on Cash Return	>6%	4.1%	4.2%	4.1%	4.1%	4.1%	4.1%	4.4%	4.4%	4.5%	4.5%
Internal Rate of Return	>=10%	9.2%	9.4%	9.2%	9.2%	9.2%	9.1%	9.8%	10.1%	10.3%	10.3%
ROE (year 5)	>6%	4.9%	5.0%	4.9%	4.9%	4.9%	4.9%	5.3%	5.4%	5.5%	5.6%

**Figure III-7.
Inclusionary
Housing
Feasibility at
80% AMI,
Rental
Residential**

Note:

Orange shading indicates output that falls below feasibility threshold.

Green checks indicate financial feasibility for specified affordability target and prototype.

High Cost Submarket includes 5% price premium on market-rate units and sale prices.

Source:

Root Policy Research.

Return Metric		Typical Submarket						High Cost Submarket			
		3-Story Rental Residential	5-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential
Target											
Affordable Income Target of 80% AMI											
10% @ 80% AMI		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Return on Cost	>5.5%	5.5%	5.6%	5.5%	5.5%	5.5%	5.5%	5.6%	5.6%	5.7%	5.7%
Cash on Cash Return	>6%	4.9%	4.9%	4.8%	4.9%	4.9%	4.8%	5.1%	5.2%	5.3%	5.3%
Internal Rate of Return	>=10%	11.1%	11.2%	11.0%	11.1%	11.1%	11.0%	11.6%	11.9%	12.2%	12.2%
ROE (year 5)	>6%	6.1%	6.1%	6.0%	6.0%	6.1%	6.0%	6.4%	6.6%	6.7%	6.8%
12% @ 80% AMI		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Return on Cost	>5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.6%	5.6%	5.6%	5.6%
Cash on Cash Return	>6%	4.7%	4.8%	4.7%	4.7%	4.7%	4.6%	4.9%	5.0%	5.1%	5.1%
Internal Rate of Return	>=10%	10.8%	10.8%	10.6%	10.7%	10.7%	10.5%	11.2%	11.5%	11.7%	11.7%
ROE (year 5)	>6%	5.8%	5.9%	5.7%	5.8%	5.8%	5.7%	6.1%	6.3%	6.4%	6.5%
15% @ 80% AMI		✗	✗	✗	✗	✗	✗	✓	✓	✓	✓
Return on Cost	>5.5%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.5%	5.5%	5.5%	5.5%
Cash on Cash Return	>6%	4.5%	4.6%	4.4%	4.4%	4.4%	4.4%	4.7%	4.8%	4.8%	4.8%
Internal Rate of Return	>=10%	10.3%	10.3%	10.0%	10.1%	10.0%	9.8%	10.6%	10.8%	11.0%	11.0%
ROE (year 5)	>6%	5.5%	5.6%	5.4%	5.4%	5.4%	5.3%	5.7%	5.9%	6.0%	6.0%
18% @ 80% AMI		✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Return on Cost	>5.5%	5.4%	5.4%	5.3%	5.3%	5.3%	5.3%	5.4%	5.4%	5.4%	5.4%
Cash on Cash Return	>6%	4.3%	4.3%	4.2%	4.2%	4.2%	4.1%	4.4%	4.5%	4.5%	4.5%
Internal Rate of Return	>=10%	9.7%	9.8%	9.5%	9.4%	9.3%	9.1%	10.0%	10.2%	10.3%	10.3%
ROE (year 5)	>6%	5.2%	5.2%	5.1%	5.1%	5.0%	4.9%	5.4%	5.5%	5.5%	5.5%
20% @ 80% AMI		✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Return on Cost	>5.5%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.4%	5.4%	5.4%	5.4%
Cash on Cash Return	>6%	4.2%	4.2%	4.1%	4.0%	4.0%	3.9%	4.3%	4.3%	4.3%	4.3%
Internal Rate of Return	>=10%	9.4%	9.4%	9.1%	9.0%	8.9%	8.7%	9.6%	9.7%	9.8%	9.8%
ROE (year 5)	>6%	5.0%	5.0%	4.9%	4.8%	4.7%	4.6%	5.1%	5.2%	5.3%	5.3%

Rental residential summary findings. The following inclusionary requirements are feasible for rental residential prototypes in typical submarkets:

- 5% of units affordable to 50% AMI;
- 8% of units affordable to 60% AMI;
- 10% of units affordable to 70% AMI; and/or
- 12% of units affordable to 80% AMI.

High cost submarkets can tolerate higher affordability requirements (or deeper affordability thresholds). Though they require a larger capital outlay for land costs they also achieve above-average rents which increase their feasibility and overall value. The following inclusionary requirements are feasible in high-cost submarkets:

- 8% of units affordable to 50% AMI;
- 10% of units affordable to 60% AMI;
- 12% of units affordable to 70% AMI; and/or
- 15% of units affordable to 80% AMI.

For-sale residential summary findings. Results of feasibility testing in for-sale prototypes are shown in Figure II-8.

**Figure III-8.
Inclusionary
Housing
Feasibility at 70,
80%, 100%, and
120% AMI, For-
Sale Residential**

Note:
High Cost Submarket
includes 5% price premium
on market-rate units and sale
prices.
Orange shading indicates
output that falls below
feasibility threshold.

Source:
Root Policy Research..

Return Metric	Target	Typical Submarket				High Cost
		Single Unit Infill	Town-homes	5-Story Condo	12-Story Condo	12-Story Condo
No Inclusionary; Current Linkage only						
Return on Cost	>6.5%	12.6%	11.7%	12.8%	14.5%	15.7%
Cash on Cash Return	>12%	41.9%	39.0%	25.7%	24.2%	26.1%
Affordable Income Target of 60% AMI						
5% @ 60% AMI		✓	✓	✓	✓	✓
Return on Cost	>6.5%	9.1%	8.9%	9.4%	10.9%	11.9%
Cash on Cash Return	>12%	30.3%	29.8%	18.8%	18.2%	19.9%
8% @ 60% AMI		✓	✓	✓	✓	✓
Return on Cost	>6.5%	6.8%	6.8%	7.1%	8.5%	9.4%
Cash on Cash Return	>12%	22.8%	22.8%	14.2%	14.1%	15.7%
10% @ 60% AMI		✗	✗	✗	✗	✓
Return on Cost	>6.5%	5.3%	5.5%	5.5%	6.9%	7.8%
Cash on Cash Return	>12%	17.8%	18.2%	11.0%	11.4%	12.9%
12% @ 60% AMI		✗	✗	✗	✗	✗
Return on Cost	>6.5%	3.8%	4.1%	4.0%	5.3%	6.1%
Cash on Cash Return	>12%	12.8%	13.5%	7.9%	8.8%	10.2%

**Figure III-8
(continued).
Inclusionary
Housing
Feasibility at 70,
80%, 100%, and
120% AMI, For-
Sale Residential**

Note:

High Cost Submarket includes 5% price premium on market-rate units and sale prices.

Orange shading indicates output that falls below feasibility threshold.

Source:

Root Policy Research..

Return Metric		Typical Submarket				High Cost
		Single Unit Infill	Town-homes	5-Story Condo	12-Story Condo	12-Story Condo
Affordable Income Target of 70% AMI						
8% @ 70% AMI		✓	✓	✓	✓	✓
Return on Cost	>6.5%	7.3%	7.4%	7.5%	8.9%	9.8%
Cash on Cash Return	>12%	24.5%	24.7%	15.1%	14.8%	16.4%
10% @ 70% AMI		✗	✗	✗	✓	✓
Return on Cost	>6.5%	6.0%	6.2%	6.1%	7.4%	8.2%
Cash on Cash Return	>12%	19.9%	20.6%	12.2%	12.3%	13.7%
12% @ 70% AMI		✗	✗	✗	✗	✗
Return on Cost	>6.5%	4.6%	4.9%	4.6%	5.9%	6.7%
Cash on Cash Return	>12%	15.3%	16.4%	9.3%	9.8%	11.1%
Affordable Income Target of 80% AMI						
10% @ 80% AMI		✓	✓	✓	✓	✓
Return on Cost	>6.5%	6.6%	6.9%	6.6%	7.9%	8.7%
Cash on Cash Return	>12%	22.0%	22.9%	13.3%	13.1%	14.5%
12% @ 80% AMI		✗	✗	✗	✗	✓
Return on Cost	>6.5%	5.3%	5.8%	5.3%	6.5%	7.3%
Cash on Cash Return	>12%	17.8%	19.3%	10.6%	10.8%	12.1%
15% @ 80% AMI		✗	✗	✗	✗	✗
Return on Cost	>6.5%	3.5%	4.1%	3.3%	4.3%	5.0%
Cash on Cash Return	>12%	11.6%	13.8%	6.6%	7.2%	8.4%
Affordable Income Target of 100% AMI						
10% @ 100% AMI		✓	✓	✓	✓	✓
Return on Cost	>6.5%	7.9%	8.3%	7.8%	8.9%	9.7%
Cash on Cash Return	>12%	26.2%	27.7%	15.5%	14.8%	16.2%
12% @ 100% AMI		✓	✓	✓	✓	✓
Return on Cost	>6.5%	6.9%	7.5%	6.6%	7.7%	8.4%
Cash on Cash Return	>12%	22.8%	25.0%	13.3%	12.8%	14.0%
15% @ 100% AMI		✗	✗	✗	✗	✓
Return on Cost	>6.5%	5.4%	6.3%	5.0%	5.8%	6.5%
Cash on Cash Return	>12%	17.9%	20.9%	9.9%	9.7%	12.0%
18% @ 100% AMI		✗	✗	✗	✗	✗
Return on Cost	>6.5%	3.9%	5.1%	3.3%	4.0%	4.6%
Cash on Cash Return	>12%	12.9%	16.8%	6.6%	6.7%	7.6%
Affordable Income Target of 120% AMI						
12% @ 120% AMI		✓	✓	✓	✓	✓
Return on Cost	>6.5%	8.4%	9.2%	8.0%	8.9%	9.6%
Cash on Cash Return	>12%	27.9%	30.7%	16.0%	14.8%	16.0%
15% @ 120% AMI		✓	✓	✓	✓	✓
Return on Cost	>6.5%	7.2%	8.4%	6.6%	7.3%	7.9%
Cash on Cash Return	>12%	24.2%	28.1%	13.3%	12.2%	13.2%
18% @ 120% AMI		✗	✓	✗	✗	✗
Return on Cost	>6.5%	6.1%	7.6%	5.3%	5.8%	6.3%
Cash on Cash Return	>12%	20.4%	25.4%	10.6%	9.7%	10.5%
20% @ 120% AMI		✗	✓	✗	✗	✗
Return on Cost	>6.5%	5.4%	7.1%	4.4%	4.8%	5.2%
Cash on Cash Return	>12%	18.0%	23.7%	8.8%	8.0%	8.7%

The following inclusionary requirements are feasible for for-sale residential prototypes:

- Typical submarkets:
 - 8% of units affordable to 60% AMI;
 - 8% of units at 70% AMI;
 - 10% of units at 80% AMI;
 - 12% of units at 100% AMI; or
 - 15% of units affordable to 120% AMI.
- High cost submarkets (12-story condos):
 - 10% of units at 60% AMI;
 - 10% of units at 70% AMI;
 - 12% of units at 80% AMI;
 - 15% of units at 100% AMI; or
 - 15% of units at 120% AMI.

Impacts to key project outcomes. Implementation of an inclusionary housing requirement at the maximum feasible affordability requirement reduces rental residential developments' net operating income by 4% to 6% and reduces annual net cash flow by 12% to 18% in a typical submarket. In a high cost submarket, the proportional losses are greater (because the difference in market-rate rents and affordable rents is greater) but the projects have more room to absorb such impacts and maintain feasibility targets.

Figure III-9 shows the change in key project outcomes under varying inclusionary alternatives for rental residential prototypes.

Figure III-10 shows changes to key outcomes for for-sale residential prototypes (assumes single-unit prototypes and townhome developments of 100 units to illustrate scale).

Full proformas for the prototypes under the specified inclusionary alternatives are provided in Appendix C.

Figure III-9.
Change in Project Outcomes Under Inclusionary Alternatives, Rental Residential

Project Outcomes	Typical Submarket						High Cost Submarket			
	3-Story	5-Story	8-Story	12-Story	16-Story	20-Story	8-Story	12-Story	16-Story	20-Story
No Inclusionary; Current Linkage only										
Total Development Cost	\$20,523,356	\$47,936,649	\$77,551,939	\$105,932,051	\$124,177,348	\$142,251,396	\$80,002,189	\$110,015,801	\$128,261,098	\$146,335,146
Net Operating Income (NOI)	\$1,177,213	\$2,751,440	\$4,439,791	\$6,102,880	\$7,183,325	\$8,214,624	\$4,711,706	\$6,482,665	\$7,622,699	\$8,717,077
Project Value (NOI/Cap Rate)	\$23,544,258	\$55,028,798	\$88,795,823	\$122,057,606	\$143,666,496	\$164,292,488	\$94,234,129	\$129,653,306	\$152,453,981	\$174,341,542
Net Project Value	\$23,073,373	\$53,928,222	\$87,019,907	\$119,616,454	\$140,793,166	\$161,006,638	\$92,349,447	\$127,060,240	\$149,404,901	\$170,854,712
Project Margin	\$2,550,017	\$5,991,573	\$9,467,967	\$13,684,403	\$16,615,818	\$18,755,242	\$12,347,258	\$17,044,439	\$21,143,803	\$24,519,565
Annual Net Cash Flow	\$339,189	\$794,058	\$1,273,138	\$1,777,391	\$2,112,831	\$2,406,119	\$1,445,003	\$1,990,425	\$2,385,455	\$2,741,821
Percent Change From Baseline Under Feasible Inclusionary Alternatives										
IH: 5% at 50% AMI						8% at 50% AMI				
Net Operating Income (NOI)	-4%	-4%	-4%	-4%	-4%	-4%	-6%	-6%	-6%	-6%
Project Value (NOI/Cap Rate)	-4%	-4%	-4%	-4%	-4%	-4%	-6%	-6%	-6%	-6%
Project Margin	-32%	-29%	-30%	-30%	-29%	-30%	-48%	-43%	-42%	-42%
Annual Net Cash Flow	-13%	-11%	-12%	-12%	-12%	-12%	-21%	-19%	-19%	-19%
IH: 8% at 60% AMI						10% at 60% AMI				
Net Operating Income (NOI)	-5%	-5%	-5%	-5%	-5%	-5%	-6%	-7%	-7%	-7%
Project Value (NOI/Cap Rate)	-5%	-5%	-5%	-5%	-5%	-5%	-6%	-7%	-7%	-7%
Project Margin	-44%	-40%	-41%	-42%	-42%	-43%	-51%	-47%	-46%	-46%
Annual Net Cash Flow	-17%	-16%	-16%	-17%	-17%	-17%	-22%	-21%	-21%	-21%
IH: 10% at 70% AMI						12% at 70% AMI				
Net Operating Income (NOI)	-5%	-5%	-5%	-5%	-6%	-6%	-6%	-7%	-7%	-7%
Project Value (NOI/Cap Rate)	-5%	-5%	-5%	-5%	-6%	-6%	-6%	-7%	-7%	-7%
Project Margin	-43%	-40%	-42%	-43%	-44%	-46%	-51%	-48%	-47%	-47%
Annual Net Cash Flow	-17%	-16%	-16%	-17%	-18%	-18%	-22%	-21%	-22%	-22%
IH: 12% at 80% AMI						15% at 80% AMI				
Net Operating Income (NOI)	-4%	-4%	-5%	-5%	-5%	-6%	-6%	-7%	-7%	-7%
Project Value (NOI/Cap Rate)	-4%	-4%	-5%	-5%	-5%	-6%	-6%	-7%	-7%	-7%
Project Margin	-37%	-36%	-39%	-41%	-43%	-45%	-51%	-49%	-49%	-50%
Annual Net Cash Flow	-14%	-14%	-15%	-16%	-18%	-18%	-22%	-21%	-22%	-23%

Note: High Cost Submarket includes 5% price premium on market-rate units and sale prices.

Source: Root Policy Research.

For-sale project impacts (shown in Figure III-10) show revenue losses of 4% to 8% and project margin declines from 28% to 59%.

Figure III-10.
Change in Project Outcomes Under Feasible Inclusionary Alternatives, For-Sale Residential

Project Outcomes	Typical Submarket				High Cost
	Single Unit Infill	Townhomes	5-Story Condo	12-Story Condo	12-Story Condo
No Inclusionary; Current Linkage only					
Number of Units in Dev.	100	100	95	233	233
Total Development Cost	\$76,081,020	\$59,927,279	\$52,693,152	\$143,552,214	\$148,997,214
<i>Total Dev Cost per unit</i>	<i>\$760,810</i>	<i>\$599,273</i>	<i>\$554,665</i>	<i>\$616,104</i>	<i>\$639,473</i>
Sales Revenue	\$86,500,000	\$68,300,000	\$60,669,375	\$167,760,000	\$175,856,750
<i>Sale Revenue per unit</i>	<i>\$865,000</i>	<i>\$683,000</i>	<i>\$638,625</i>	<i>\$720,000</i>	<i>\$754,750</i>
Net Project Value	\$85,635,000	\$66,934,000	\$59,455,988	\$164,404,800	\$172,339,615
Project Margin	\$9,553,980	\$7,006,721	\$6,762,836	\$20,852,586	\$23,342,401
Percent Change From Baseline Under Feasible Inclusionary Alternatives					
IH: 8% at 60% AMI					10% at 60% AMI
Sales Revenue	-5%	-5%	-6%	-6%	-7%
Net Project Value	-5%	-5%	-6%	-6%	-7%
Project Margin	-46%	-42%	-45%	-42%	-51%
IH: 10% at 80% AMI					12% at 80% AMI
Sales Revenue	-6%	-5%	-6%	-6%	-8%
Net Project Value	-6%	-5%	-6%	-6%	-8%
Project Margin	-48%	-41%	-49%	-46%	-54%
IH: 12% at 100% AMI					15% at 100% AMI
Sales Revenue	-5%	-4%	-6%	-6%	-8%
Net Project Value	-5%	-4%	-6%	-6%	-8%
Project Margin	-46%	-36%	-49%	-47%	-59%
IH: 15% at 120% AMI					15% at 120% AMI
Sales Revenue	-5%	-4%	-6%	-7%	-7%
Net Project Value	-5%	-4%	-6%	-7%	-7%
Project Margin	-42%	-28%	-48%	-50%	-49%

Note: High Cost Submarket includes 5% price premium on market-rate units and sale prices.

Source: Root Policy Research.

Sensitivity analysis. Feasibility was also evaluated across varying development configurations and income mixes to test the sensitivity of outcomes. Findings are summarized below; case studies showing results of sensitivity analyses are included in Appendix D.

- Model results are sensitive to fluctuations in construction cost, market rent and amenity expectations. Marginal increases in building costs without commensurate increases in

market-rents may render some of the incentives infeasible. Conversely, softening building costs coupled with stable rents could improve the viability of incentive options.

- Bedroom configuration impacts feasibility as units with more bedrooms achieve lower rents per square foot than studios, even after accounting for the marginally lower building costs. In addition, the gap between market-rate and affordable rents for 2+ bedroom units is greater than the difference between market rate and affordable studios. In other words, larger affordable units require more cross-subsidy than smaller ones.
- A variety of incentives or offsets (e.g., cash subsidy, parking reductions, density bonuses) could improve viability of an inclusionary requirement. These are discussed in more details in Section IV of this report.

Development Cost per Unit and Fee-in-Lieu

Most cities with an inclusionary housing ordinance offer a “fee-in-lieu” compliance option, which allows developers to pay a specified fee instead of constructing the affordable units.⁹ House Bill 21-1117 requires any community pursuing inclusionary housing policies in Colorado to provide alternatives to constructing units on site. A fee-in-lieu is the most logical and common alternative. Fees can be structured on a per square foot or per unit basis and range from nominal fee amounts up to the full cost of developing the affordable unit. In general, low fees incentivize developers to pay the fee-in-lieu rather than build units, which contributes to revenue generation but directly results in relatively few affordable units. High fees are more likely to incentivize developers to construct units on site and would result in lower revenue generation. For example, the City of Atlanta set its in lieu fees equivalent to the average cost of unit development and nearly all developers in the program constructed the affordable units rather than paying the fee. Other cities set a fee-in-lieu similar to the sale price of the affordable unit.

The following analysis applies two common methodologies to calculate potential fee-in-lieu options for the City’s consideration:

- Development cost method—fee based on the actual cost (or subset of costs) to develop affordable units.
- Affordability gap method—fee based on the difference in price between market-rate units and affordable units (note for rentals this method reflects the difference in the capitalized value of market rate units and affordable units).

Development cost method. As noted above, the fee amount is typically driven by policy priorities (within the bounds of feasibility). As such the following analysis does not test specific fees but rather quantifies the likely upper limit of in lieu fees by providing the

⁹ See Expanding Affordable Housing Background Report for additional details on peer city programs.

development cost per unit of each prototype in both typical and high cost submarkets. Figure III-11 shows the results, including major components of total development cost.

In a typical submarket, total development cost per unit for rental residential prototypes range from \$316,000 to \$395,000, while for sale condo prototypes range from \$555,000 to \$616,000. Total development cost per unit are higher in high cost areas, driven solely by increase in land cost per unit.

It should be noted that cost per unit fluctuates depending on the bedroom mix in a development. The figures above reflect the typical bedroom mix (see Section I for details) which reflect an average 1.4 bedrooms in 3-story walkups, 1.2 bedrooms in 5- and 8-story prototypes, and 1.0 bedroom in high rise developments (12+stories). Should the City desire to calibrate the in-lieu fee by unit size (i.e., bedrooms), the following cost premiums could serve as a guide:

- Building cost per unit for studios is typically 27% lower than 1-bedrooms;
- Building cost per unit for 2-bedroom units is typically 48% higher than 1-bedrooms; and
- Building cost per unit for 3-bedroom units is typically 92% higher than 1-bedrooms.¹⁰

Why are the per-unit development costs shown in Figure III-11 higher for condos than rentals, even when building height is the same?

The condo prototypes carry different assumptions, which impact the per unit costs overall—specifically, condos assume a lower efficiency rate, larger unit size, both in square footage and in number of bedrooms and condo prototypes have higher parking ratios and more costly parking configurations (higher proportion of underground parking). In addition to these configuration differences, condos are also assumed to have a slightly higher finish level than rentals. Other key cost differences reflected in hard costs are higher insurance requirements on condo developments (related to concerns about construction defects litigation) and a smaller pool of subcontractors in for-sale development, driving up labor costs. High construction (and other hard costs) are magnified throughout the pro forma as they also lead to higher contingencies and financing costs.

¹⁰ Based on unit size assumptions and building costs outlined in Section I.

Figure III-11.
Development Cost Per Unit, Residential Prototypes

COST CATEGORY	FOR-SALE RESIDENTIAL					RENTAL RESIDENTIAL						
	Single Unit	Town-homes	5-Story Condo	12-Story Condo	Average Across Prototypes	3-Story Rental	5-Story Rental	8-Story Rental	12-Story Rental	16-Story Rental	20-Story Rental	Average Across Prototypes
Typical Submarket												
Land Cost	\$210,000	\$90,000	\$45,853	\$32,717	\$94,642	\$40,209	\$31,114	\$15,557	\$19,715	\$17,866	\$15,881	\$23,390
Hard Costs	\$443,021	\$399,525	\$388,859	\$442,664	\$418,517	\$216,021	\$240,668	\$270,259	\$263,035	\$279,620	\$285,397	\$259,167
Building Cost	\$405,789	\$370,500	\$334,211	\$372,775	\$370,819	\$201,925	\$203,193	\$230,689	\$223,786	\$238,559	\$243,335	\$223,581
Site Prep, Landscaping	\$16,232	\$18,525	\$16,711	\$18,639	\$17,526	\$10,096	\$10,160	\$11,445	\$11,125	\$11,811	\$12,063	\$11,117
Parking	\$21,000	\$10,500	\$37,938	\$51,250	\$30,172	\$4,000	\$27,315	\$28,125	\$28,125	\$29,250	\$30,000	\$24,469
Soft Costs	\$72,638	\$73,411	\$78,012	\$88,412	\$78,118	\$39,453	\$46,104	\$54,321	\$52,792	\$56,050	\$57,154	\$50,979
Construction Financing	\$14,524	\$17,420	\$23,266	\$31,068	\$21,569	\$10,517	\$13,048	\$16,175	\$17,107	\$21,091	\$23,008	\$16,824
Contingency	\$20,626	\$18,917	\$18,675	\$21,243	\$19,865	\$10,219	\$11,471	\$12,983	\$12,633	\$13,427	\$13,702	\$12,406
TOTAL DEV. COST PER UNIT	\$760,810	\$599,273	\$554,665	\$616,104	\$632,713	\$316,420	\$342,405	\$369,295	\$365,283	\$388,054	\$395,143	\$362,767
High Cost Submarket												
Land Cost				\$56,086	\$56,086			\$31,114	\$33,797	\$30,628	\$27,225	\$30,691
Hard Costs				\$442,664	\$442,664			\$270,259	\$263,035	\$279,620	\$285,397	\$274,578
Building Cost				\$372,775	\$372,775			\$230,689	\$223,786	\$238,559	\$243,335	\$234,092
Site Prep, Landscaping				\$18,639	\$18,639			\$11,445	\$11,125	\$11,811	\$12,063	\$11,611
Parking				\$51,250	\$51,250			\$28,125	\$28,125	\$29,250	\$30,000	\$28,875
Soft Costs				\$88,412	\$88,412			\$54,321	\$52,792	\$56,050	\$57,154	\$55,079
Construction Financing				\$31,068	\$31,068			\$16,175	\$17,107	\$21,091	\$23,008	\$19,345
Contingency				\$21,243	\$21,243			\$12,983	\$12,633	\$13,427	\$13,702	\$13,186
TOTAL DEV. COST PER UNIT				\$639,473	\$639,473			\$384,852	\$379,365	\$400,816	\$406,487	\$392,880

Source: Root Policy Research.

Affordability gap method. As noted above, the affordability gap method establishes fee-in-lieu based on the difference in price between market-rate units and affordable units. For rental residential units this method reflects the difference in the capitalized value of market rate units and affordable units.

Figure III-12 shows a potential fee-in-lieu based on the affordability gap method, using 80% AMI as the baseline affordable requirement on for-sale residential and 60% AMI as the baseline affordable requirement on rental residential. Fees are shown as dollars per affordable unit.

**Figure III-12.
Affordability
Gap
Method—
Fee-in-lieu
Calculation,
Residential
Prototypes**

Note:

Affordable for-sale home prices assume 4-person household for single family infill, 3-person household for townhomes, and 2-person household for condos. Condos prices account for HOA fees (higher than in townhomes/single family).

Rental capitalization assumes 5% cap rate. Rental residential fee calculation reflects difference in capitalized rates of market-rate units and affordable units.

Source:

Root Policy Research.

For-Sale Residential	FEE CALCULATION			Fee per affordable unit
	Market-Rate Price	Affordable Price @ 80% AMI	Difference in Price	
Typical Submarket				
Single Family Infill	\$865,000	\$386,347	\$478,653	\$478,653
Owner Townhomes	\$683,000	\$348,007	\$334,993	\$334,993
5-Story Condo	\$628,000	\$251,305	\$376,695	\$376,695
12-Story Condo	\$695,000	\$251,305	\$443,695	\$443,695
Average Across Prototypes	\$717,750	\$309,241	\$408,509	\$408,509
High Cost Submarket				
12-Story Condo	\$729,750	\$251,305	\$478,445	\$478,445

Rental Residential	Market-Rate Units			Affordable Units			Fee per affordable unit
	Monthly Rent	NOI per Unit	Capitalized Value per Unit	Monthly Rent	NOI per Unit	Capitalized Value per Unit	
Typical Submarket							
3-Story Rental	\$2,207	\$18,111	362,219	\$1,184	\$6,518	130,363	\$231,857
5-Story Rental	\$2,195	\$19,653	393,063	\$1,142	\$7,600	152,004	\$241,058
8-Story Rental	\$2,272	\$21,142	422,837	\$1,142	\$8,120	162,395	\$260,442
12-Story Rental	\$2,298	\$21,044	420,888	\$1,117	\$7,427	148,539	\$272,349
16-Story Rental	\$2,409	\$22,448	448,958	\$1,117	\$7,562	151,232	\$297,726
20-Story Rental	\$2,449	\$22,818	456,368	\$1,117	\$7,479	149,580	\$306,788
Average Across Prototypes	\$2,305	\$20,869	417,389	\$1,137	\$7,451	149,019	\$268,370
High Cost Submarket							
8-Story Rental	\$2,385	\$22,437	448,734	\$1,142	\$8,120	162,395	\$286,339
12-Story Rental	\$2,412	\$22,354	447,080	\$1,117	\$7,427	148,539	\$298,541
16-Story Rental	\$2,529	\$23,821	476,419	\$1,117	\$7,562	151,232	\$325,186
20-Story Rental	\$2,571	\$24,214	484,282	\$1,117	\$7,479	149,580	\$334,702
Average Across Prototypes	\$2,474	\$23,206	464,129	\$1,123	\$7,647	152,936	\$311,192

Conclusion

The financial feasibility analysis indicates several potential policy options for an inclusionary housing program that can generate units to better meet the City's affordability needs while maintaining target financial returns for developers. The results of this analysis can be considered a conservative estimate as they do not account for natural market adjustments (e.g., changes in land costs and other development accommodations) following implementation of a policy that would likely increase feasibility beyond the requirements summarized below.

Rental residential prototypes maintain financial feasibility thresholds under inclusionary housing policy with the following requirements:

- **50% AMI:** 5% of units in typical submarkets and 8% in high cost submarkets (50% AMI contract rent for a 1-bedroom is \$886);
- **60% AMI:** 8% of units in typical submarkets and 10% in high cost submarkets (60% AMI contract rent for a 1-bedroom is \$1,082);
- **70% AMI:** 10% of units in typical submarkets and 12% in high cost submarkets (70% AMI contract rent for a 1-bedroom is \$1,279); and
- **80% AMI:** 12% of units in typical submarkets and 15% in high cost submarkets (80% AMI contract rent for a 1-bedroom is \$1,476).

For-sale residential can absorb an inclusionary policy requiring 8% of units affordable to 60% AMI, 10% of units at 80% AMI, 12% of units at 100% AMI, or 15% of units affordable to 120% AMI while maintaining financial feasibility thresholds. In high-cost markets (high rise condos only), feasibility extends to 10% of units at 60% AMI 12% of units at 80% AMI, 15% of units at 100% AMI, and 15% of units at 120% AMI.

SECTION IV.

INCLUSIONARY INCENTIVES

SECTION IV.

Inclusionary Incentives

This section evaluates the financial benefit of a variety of potential incentives the City could offer to developers to encourage on-site construction of affordable units (as opposed to paying a fee-in-lieu) and/or exceeding baseline inclusionary requirements. Root evaluated whether/how the following potential incentive types could be utilized in conjunction with an inclusionary housing requirement to maximize outcomes:

- Incentives to encourage on-site affordable unit construction:
 - Building permit fee reductions (or subsidy at time of building permit)
 - Parking reductions down to 0.5 spaces per unit)
- Incentives for exceeding baseline affordability requirements:
 - Density/height bonuses

In addition to meeting the baseline financial feasibility targets, an incentive program must also demonstrate some level of “attractiveness” to property developers. Desirability of incentive alternatives was quantified through changes in nominal project values and nominal profit after accounting for affordability requirements. Increases in project value and profit were considered desirable (contingent on the incentivized development also meeting financial feasibility targets).

Though a number of inclusionary program requirements were demonstrated to be financially feasible in Section II, this incentives analysis assumes the following as a baseline requirement for the sake of consistent comparison across incentive options:

- Rental: 8% of units at 60% AMI in a typical market; and 10% of units at 60% AMI in high cost markets.
- Ownership: 10% of units at 80% AMI in typical markets; and 12% of units at 80% AMI in high cost markets.

Incentives to Encourage On-Site Affordable Unit Construction

The following analysis focuses on incentives that are offered when building affordable units on site (as opposed to paying a fee-in-lieu or pursuing another alternative). The analysis assumes the baseline inclusionary requirements described above. The following incentives improve financial feasibility targets relative to what is shown in Section III for the baseline affordability requirements.

Permit fee reduction. Cash subsidies can take the form of a direct financial contribution or operate as a permit fee reduction. For the analysis below, the mechanism of the subsidy payment is immaterial, but it is assumed that the subsidy occurs as a direct development cost reduction at the time of construction loan closing.

A typical approach to calibrating a direct subsidy for rental residential prototypes is to consider the change in net operating income (NOI) created by the affordable requirement and offering an offset to that reduction.

Why does NOI matter?

As discussed in Section I, NOI is derived from gross operating income, minus operating expenses, a vacancy allowance (i.e., revenue loss for vacant units), and replacement reserves. It is a critical factor in evaluating the viability and profitability of any project as it is directly tied to both annual revenue potential but also the sales value of a development project.

When affordable unit construction is required in rental developments, the income restricted units reduce the potential net operating income (though the per-unit cost of constructing affordable units and operating them is typically the same as market-rate units).

Figure IV-1 shows the difference in NOI for the first year of stabilized operation between a fully market-rate development and one meeting the baseline inclusionary requirement (8% of units at 60% AMI in a typical submarket and 10% of units at 60% AMI in a high-cost submarket).

- On average, across all prototypes analyzed, the first-year difference in NOI between a fully market-rate development and one designating 8% of units affordable to 60% AMI in a typical submarket is \$13,419 per affordable unit. In other words, the developer is losing \$13,419 in net operating income during the first year of stabilized operations for each affordable unit created at 60% AMI.
- In high-cost submarkets, the average loss is higher at \$15,560 per affordable unit created at 60% AMI because the difference between market-rate and income restricted unit rents is higher in these areas.

Figure IV-1.
Direct Subsidy Required to Offset Difference in First Year of Stabilized NOI

	RENTAL RESIDENTIAL					
	3-Story Rental	5-Story Rental	8-Story Rental	12-Story Rental	16-Story Rental	20-Story Rental
Typical Submarket						
Fully Market-Rate Development (no inclusionary)						
Total Residential units	65	140	210	290	320	360
Affordable Units	0	0	0	0	0	0
Effective Gross Income	\$1,649,925	\$3,765,810	\$6,076,181	\$8,421,105	\$9,867,725	\$11,217,074
Expenses and replacement reserve	-\$472,713	-\$1,014,370	-\$1,636,390	-\$2,318,225	-\$2,684,400	-\$3,002,450
Net Operating Income (NOI)	\$1,177,213	\$2,751,440	\$4,439,791	\$6,102,880	\$7,183,325	\$8,214,624
Inclusionary Development with 8% of units affordable to 60% AMI (on-site)						
Total Residential units	65	140	210	290	320	360
Affordable Units with 8% req.	5	11	17	23	26	29
Effective Gross Income	\$1,589,642	\$3,630,816	\$5,857,407	\$8,105,177	\$9,486,632	\$10,775,295
Expenses and replacement reserve	-\$472,713	-\$1,014,370	-\$1,636,390	-\$2,318,225	-\$2,684,400	-\$3,002,450
Net Operating Income (NOI)	\$1,116,930	\$2,616,446	\$4,221,017	\$5,786,952	\$6,802,232	\$7,772,845
Difference in NOI (development with 8% @60% AMI compared to fully market-rate)						
Difference in NOI	-\$60,283	-\$134,994	-\$218,774	-\$315,928	-\$381,092	-\$441,780
Diff. in NOI per affordable unit	-\$11,593	-\$12,053	-\$13,022	-\$13,618	-\$14,886	-\$15,340
Average difference in NOI per affordable unit across all prototypes: \$13,419						
High Cost Submarket						
Fully Market-Rate Development (no inclusionary)						
Total Residential units			210	290	320	360
Affordable Units			0	0	0	0
Effective Gross Income			\$6,348,096	\$8,800,890	\$10,307,099	\$11,719,527
Expenses and replacement reserve			-\$1,636,390	-\$2,318,225	-\$2,684,400	-\$3,002,450
Net Operating Income (NOI)			\$4,711,706	\$6,482,665	\$7,622,699	\$8,717,077
Inclusionary Development with 10% of units affordable to 60% AMI (on-site)						
Total Residential units			210	290	320	360
Affordable Units with 10% req.			21	29	32	36
Effective Gross Income			\$6,047,438	\$8,368,001	\$9,786,796	\$11,117,057
Expenses and replacement reserve			-\$1,636,390	-\$2,318,225	-\$2,684,400	-\$3,002,450
Net Operating Income (NOI)			\$4,411,048	\$6,049,776	\$7,102,396	\$8,114,607
Difference in NOI (development with 10% @60% AMI compared to fully market-rate)						
Difference in NOI			-\$300,659	-\$432,889	-\$520,303	-\$602,470
Diff. in NOI per affordable unit			-\$14,317	-\$14,927	-\$16,259	-\$16,735
Average difference in NOI per affordable unit across all prototypes: \$15,560						

Source: Root Policy Research.

When structured as a fee reduction, subsidies generally have a cap set as a proportion of total fees owed—in other words, cities do not typically offer a fee reduction that exceeds fees owed on the specified development.

Figure IV-2 shows the impact to the rental residential developments when offered a fee waiver of \$13,000 per affordable unit at 60% AMI in typical Markets, and \$15,000 per affordable unit at 60% AMI in high cost markets—roughly comparable to the average first-year NOI reduction modeled in Figure IV-1.

Figure IV-3 shows the impact to the rental residential developments when offered a fee waiver of \$6,500 per affordable unit at 60% AMI in typical Markets, and \$7,500 per affordable unit at 60% AMI in high cost markets. These amounts reflect roughly half of the NOI loss identified in Figure IV-1.

Though the magnitude of the impact is relatively small on output metrics, the fee reduction does serve to improve overall feasibility by reducing development costs and subsequent debt service. Fee reductions of \$6,500 per affordable unit reduce total development cost in a typical market area by about one quarter of a percent and improve output metrics by a range of 1 to 5 basis points.¹

¹ Basis points (BPS) refers to a common unit of measure for interest rates and other percentages in finance. One basis point is equal to 1/100th of 1%, or 0.01%, or 0.0001, and is used to denote the percentage change in a financial instrument.

Figure IV-2.
Impact of \$13,000 and \$15,000 per unit Fee Reduction, Rental Residential

Project Outcomes	Typical Submarket						High Cost Submarket			
	3-Story Rental Residential	5-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential
Total Units	65	140	210	290	320	360	210	290	320	360
Total Affordable Units	5	11	17	23	26	29	21	29	32	36
Baseline inclusionary, build on-site with no incentives: 8% at 60% AMI							10% at 60% AMI (build on site)			
Total Development Cost	\$20,451,361	\$47,696,521	\$77,190,310	\$105,465,225	\$123,658,174	\$141,671,715	\$80,457,310	\$109,548,975	\$127,741,924	\$145,755,465
Annual Debt Service	\$835,084	\$1,947,577	\$3,151,887	\$4,306,428	\$5,049,295	\$5,784,836	\$3,285,288	\$4,473,178	\$5,216,045	\$5,951,586
Return on Cost (>5.5%)	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.6%	5.6%
Cash on Cash Return (>6%)	4.6%	4.7%	4.6%	4.7%	4.7%	4.7%	4.7%	4.8%	4.9%	4.9%
IRR (>10%)	10.4%	10.6%	10.5%	10.6%	10.8%	10.6%	10.6%	10.9%	11.2%	11.3%
Return on Equity (>6%)	5.6%	5.7%	5.7%	5.8%	5.8%	5.8%	5.7%	5.9%	6.1%	6.2%
Baseline inclusionary (8% at 60% AMI, build on-site), with fee reduction (\$13,000 per affordable unit)							10% at 60% AMI with \$15,000 fee reduction per aff. unit			
Outcomes										
Total Development Cost	\$20,378,274	\$47,538,472	\$76,952,290	\$105,135,224	\$123,291,151	\$141,257,192	\$80,114,012	\$109,073,012	\$127,212,564	\$145,157,595
Annual Debt Service	\$832,100	\$1,941,123	\$3,142,168	\$4,292,953	\$5,034,308	\$5,767,910	\$3,271,270	\$4,453,743	\$5,194,430	\$5,927,173
Return on Cost (>5.5%)	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.6%	5.6%
Cash on Cash Return (>6%)	4.7%	4.7%	4.7%	4.7%	4.8%	4.7%	4.7%	4.9%	5.0%	5.0%
IRR (>10%)	10.6%	10.8%	10.6%	10.8%	10.9%	10.8%	10.8%	11.1%	11.4%	11.5%
Return on Equity (>6%)	5.7%	5.8%	5.7%	5.8%	5.9%	5.8%	5.9%	6.1%	6.2%	6.3%
Percent change from no incentive (note: negative change is in the developer's favor)										
Total Development Cost	-0.4%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%
Annual Debt Service	-0.4%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%
Basis point change from no incentive (note: positive change is in the developer's favor)										
Return on Cost (ROC)	2 bps	2 bps	2 bps	2 bps	2 bps	2 bps	2 bps	2 bps	2 bps	2 bps
Cash on Cash Return	7 bps	6 bps	6 bps	6 bps	5 bps	5 bps	8 bps	8 bps	8 bps	8 bps
Internal Rate of Return (IRR)	16 bps	15 bps	14 bps	14 bps	13 bps	13 bps	19 bps	20 bps	19 bps	18 bps
Return on Equity (ROE)	10 bps	9 bps	9 bps	9 bps	8 bps	8 bps	12 bps	12 bps	12 bps	12 bps

Note: Feasibility outcome targets for ROC, COC, IRR, and ROE shown in parentheses. 1 bps is equal to 0.01%.

Source: Root Policy Research.

Figure IV-3.
Impact of \$6,500 and \$7,500 per unit Fee Reduction, Rental Residential

Project Outcomes	Typical Submarket						High Cost Submarket			
	3-Story Rental Residential	5-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential
Total Units	65	140	210	290	320	360	210	290	320	360
Total Affordable Units	5	11	17	23	26	29	21	29	32	36
Baseline inclusionary, build on-site with no incentives: 8% at 60% AMI							10% at 60% AMI (build on site)			
Total Development Cost	\$20,451,361	\$47,696,521	\$77,190,310	\$105,465,225	\$123,658,174	\$141,671,715	\$80,457,310	\$109,548,975	\$127,741,924	\$145,755,465
Annual Debt Service	\$835,084	\$1,947,577	\$3,151,887	\$4,306,428	\$5,049,295	\$5,784,836	\$3,285,288	\$4,473,178	\$5,216,045	\$5,951,586
Return on Cost (>5.5%)	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.6%	5.6%
Cash on Cash Return (>6%)	4.6%	4.7%	4.6%	4.7%	4.7%	4.7%	4.7%	4.8%	4.9%	4.9%
IRR (>10%)	10.4%	10.6%	10.5%	10.6%	10.8%	10.6%	10.6%	10.9%	11.2%	11.3%
Return on Equity (>6%)	5.6%	5.7%	5.7%	5.8%	5.8%	5.8%	5.7%	5.9%	6.1%	6.2%
Baseline inclusionary (8% at 60% AMI, build on-site), with fee reduction (\$6,500 per affordable unit)							10% at 60% AMI with \$7,500 fee reduction per aff. unit			
Outcomes										
Total Development Cost	\$20,414,818	\$47,617,497	\$77,071,300	\$105,300,225	\$123,474,662	\$141,464,453	\$80,285,661	\$109,310,994	\$127,477,244	\$145,456,530
Annual Debt Service	\$833,592	\$1,944,350	\$3,147,028	\$4,299,690	\$5,041,801	\$5,776,373	\$3,278,279	\$4,463,461	\$5,205,237	\$5,939,380
Return on Cost (>5.5%)	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.6%	5.6%
Cash on Cash Return (>6%)	4.6%	4.7%	4.6%	4.7%	4.8%	4.7%	4.7%	4.8%	5.0%	5.0%
IRR (>10%)	10.5%	10.7%	10.6%	10.7%	10.8%	10.7%	10.7%	11.0%	11.3%	11.4%
Return on Equity (>6%)	5.7%	5.8%	5.7%	5.8%	5.9%	5.8%	5.8%	6.0%	6.2%	6.2%
Percent change from no incentive (note: negative change is in the developer's favor)										
Total Development Cost	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%	-0.1%	-0.2%	-0.2%	-0.2%	-0.2%
Annual Debt Service	-0.2%	-0.2%	-0.2%	-0.2%	-0.1%	-0.1%	-0.2%	-0.2%	-0.2%	-0.2%
Basis point change from no incentive (note: positive change is in the developer's favor)										
Return on Cost (ROC)	1 bps	1 bps	1 bps	1 bps	1 bps	1 bps	1 bps	1 bps	1 bps	1 bps
Cash on Cash Return	3 bps	3 bps	3 bps	3 bps	3 bps	3 bps	4 bps	4 bps	4 bps	4 bps
Internal Rate of Return (IRR)	8 bps	7 bps	7 bps	7 bps	7 bps	7 bps	10 bps	10 bps	9 bps	9 bps
Return on Equity (ROE)	5 bps	5 bps	4 bps	4 bps	4 bps	4 bps	6 bps	6 bps	6 bps	6 bps

Note: Feasibility outcome targets for ROC, COC, IRR, and ROE shown in parentheses. 1 bps is equal to 0.01%.

Source: Root Policy Research.

Though the above analysis focuses on reducing the impact to NOI in rental residential, fee waivers can also apply to for-sale developments. For example, applying a fee waiver of \$13,000 to \$15,000 per affordable unit to the for-sale prototypes improves return on cost by 20 to 29 basis points in typical market areas and 29 to 33 basis points in high cost areas (see Figure IV-4).

**Figure IV-4.
Impact of
Per-Unit Fee
Reduction,
For-Sale
Residential**

Note:

1 bps = 0.01%.
Feasibility outcome
targets for ROC and
COC shown in
parentheses.

Source:

Root Policy Research.

Project Outcomes	Typical Submarket				High Cost
	Single Unit Infill	Townhomes	5-Story Condo	12-Story Condo	12-Story Condo
Total Units	100	10	95	233	233
Total Affordable Units	10	1	10	23	28
Baseline inclusionary, build on-site, no incentives (10% @ 80% AMI in typical; 12% @ 80% AMI in high cost)					
Total Development Cost	\$75,893,557	\$5,955,107	\$52,466,980	\$143,016,510	\$148,461,510
Return on Cost (6.5%)	6.6%	6.9%	6.6%	7.9%	7.3%
Cash on Cash Return (12%)	22.0%	22.9%	13.3%	13.1%	12.1%
Baseline inclusionary, build on-site with fee reduction (\$13,000 in typical; \$15,000 in high cost)					
Outcomes					
Total Development Cost	\$75,754,696	\$5,941,108	\$52,332,385	\$142,683,774	\$148,000,799
Return on Cost (6.5%)	6.8%	7.1%	6.9%	8.1%	7.6%
Cash on Cash Return (12%)	22.6%	23.8%	13.8%	13.5%	12.6%
Change from no incentive					
Total Development Cost	-0.2%	-0.2%	-0.3%	-0.2%	-0.3%
Return on Cost (ROC)	20 bps	25 bps	27 bps	25 bps	33 bps
Cash on Cash Return	65 bps	84 bps	55 bps	42 bps	56 bps
Baseline inclusionary, build on-site with fee reduction (\$6,500 in typical; \$7500 in high cost)					
Outcomes					
Total Development Cost	\$75,824,126	\$5,948,107	\$52,399,682	\$142,850,142	\$148,231,154
Return on Cost (6.5%)	6.7%	7.0%	6.8%	8.0%	7.4%
Cash on Cash Return (12%)	22.3%	23.4%	13.5%	13.3%	12.4%
Change from no incentive					
Total Development Cost	-0.1%	-0.1%	-0.1%	-0.1%	-0.2%
Return on Cost (ROC)	10 bps	13 bps	14 bps	13 bps	17 bps
Cash on Cash Return	33 bps	42 bps	27 bps	21 bps	28 bps

When the fee-in-lieu threshold is set according to the methods discussed in Section II, even a small cash subsidy could serve to further incentivize on-site build requirements by improving the overall output metrics (through reduction in development costs and subsequent debt service) in comparison to paying the fee-in-lieu.

Parking reduction. The following parking reduction analysis exclusively considers the direct benefit of reduced parking costs. It should be noted that reducing parking may also allow for increased density (by adding units in lieu of parking), though this was not considered in Root's analysis. As such, the benefits of parking reduction may be understated in this case.

As discussed in Section I, parking assumptions in the Feasibility Model range from 0.75 spaces per unit to 1.25 spaces per unit with a mix of surface, tuck under, structured, and underground spaces depending on building height and use. The cost to construct parking ranges from \$4,000 per space for surface parking to \$45,000 per space for underground parking. The direct benefit of a parking reduction is lower construction costs in the short term, which also translate to lower debt service in the long term. Typically, developments do recover some parking costs by collecting monthly revenues for parking spaces, but lowering parking requirements still has a net positive impact on the development pro forma.

Figure IV-2 summarizes the development cost savings and the change in key project outcomes with a reduced parking assumption of 0.5 spaces per unit across residential prototypes. Note that the reduced parking ratio applies to all units in the development—not just the affordable units.

This reduction results in development costs that are 1% to 5% lower and return on cost that is 4 to 8 basis points higher than developments with standard parking ratios (in a typical submarket).

Figure IV-5.
Benefit of Reduced Parking Ratio

Project Outcomes	Typical Submarket						High Cost Submarket			
	3-Story Rental Residential	5-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential
Baseline parking assumption	1.00/Unit	0.90/Unit	0.75/Unit	0.75/Unit	0.75/Unit	0.75/Unit	0.75/Unit	0.75/Unit	0.75/Unit	0.75/Unit
Reduced parking assumption	0.50/Unit	0.50/Unit	0.50/Unit	0.50/Unit	0.50/Unit	0.50/Unit	0.50/Unit	0.50/Unit	0.50/Unit	0.50/Unit
Baseline inclusionary, build on-site with baseline parking assumptions: 8% at 60% AMI							10% at 60% AMI (build on site)			
Total Development Cost	\$20,451,361	\$47,696,521	\$77,190,310	\$105,465,225	\$123,658,174	\$141,671,715	\$80,457,310	\$109,548,975	\$127,741,924	\$145,755,465
Project Margin	\$1,440,458	\$3,585,818	\$5,541,633	\$7,959,032	\$9,665,580	\$10,676,041	\$5,999,228	\$9,026,640	\$11,465,039	\$13,290,836
Return on Cost (>5.5%)	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.6%	5.6%
Cash on Cash Return (>6%)	4.6%	4.7%	4.6%	4.7%	4.7%	4.7%	4.7%	4.8%	4.9%	4.9%
IRR (>10%)	10.4%	10.6%	10.5%	10.6%	10.8%	10.6%	10.6%	10.9%	11.2%	11.3%
Return on Equity (>6%)	5.6%	5.7%	5.7%	5.8%	5.8%	5.8%	5.7%	5.9%	6.1%	6.2%
Baseline inclusionary, build on-site with reduced parking assumptions (0.5 spaces per unit): 8% at 60% AMI							10% at 60% AMI with reduced parking (0.5 spaces/unit)			
Outcomes										
Total Development Cost	\$20,286,213	\$45,510,296	\$74,626,306	\$101,910,380	\$119,546,370	\$136,908,684	\$77,893,306	\$105,994,130	\$123,630,120	\$140,992,434
Project Margin	\$1,605,606	\$4,176,681	\$6,346,046	\$9,083,967	\$11,096,104	\$12,422,632	\$6,803,641	\$10,151,575	\$12,895,563	\$15,037,427
Return on Cost (>5.5%)	5.5%	5.6%	5.5%	5.6%	5.6%	5.6%	5.5%	5.6%	5.6%	5.6%
Cash on Cash Return (>6%)	4.7%	5.0%	4.8%	4.9%	5.0%	4.9%	4.9%	5.0%	5.2%	5.2%
IRR (>10%)	10.8%	11.3%	11.0%	11.2%	11.4%	11.3%	11.1%	11.5%	11.8%	11.9%
Return on Equity (>6%)	5.9%	6.2%	6.0%	6.1%	6.2%	6.2%	6.1%	6.3%	6.5%	6.6%
Percent change from no incentive										
Total Development Cost	-0.8%	-4.6%	-3.3%	-3.4%	-3.3%	-3.4%	-3.2%	-3.2%	-3.2%	-3.3%
Project Margin	11.5%	16.5%	14.5%	14.1%	14.8%	16.4%	13.4%	12.5%	12.5%	13.1%
Basis point change from no incentive										
Return on Cost (ROC)	4 bps	8 bps	7 bps	7 bps	7 bps	8 bps	7 bps	7 bps	7 bps	8 bps
Cash on Cash Return	15 bps	28 bps	23 bps	23 bps	25 bps	26 bps	22 bps	23 bps	25 bps	26 bps
Internal Rate of Return (IRR)	37 bps	69 bps	55 bps	57 bps	61 bps	64 bps	53 bps	55 bps	59 bps	63 bps
Return on Equity (ROE)	22 bps	43 bps	34 bps	36 bps	38 bps	40 bps	33 bps	35 bps	39 bps	41 bps

Note: Parking assumptions do not necessarily match parking requirements. The model uses market assumptions for typical parking ratios by prototype but actual parking requirements depend on location (e.g., urban center, downtown, transit rich, etc.) as well as existing incentives (e.g., mixed income, 60% AMI).

Source: Root Policy Research.

Incentives for Exceeding Baseline Affordability Requirements

In addition to incentivizing on-site production of affordable units, an inclusionary program can provide additional incentive options to encourage developers to exceed the baseline requirements (i.e., higher proportion of affordable units and/or units affordable to lower AMI thresholds). For incentives offered in exchange for greater affordability, Root focused the analysis on a density/height bonus.

A density or height bonus allows the developer to increase the scale of the building, and therefore the total number of units created. It is important to note that this does increase the overall cost of the development but also increases the revenue potential (from additional units). In order to be an attractive incentive, the expected additional revenue must outweigh the additional costs. In addition, there must be perceived market support for a higher density development at the site of the proposed development.

The following analysis models a height bonus, in which the square feet per story was held constant resulting in an increase in building height proportional to the density bonus. Note that this approach may push developments into a different construction type, changing the overall economics of the development. As the construction type changes (with bonus height), building costs, operating costs, and revenues shift to reflect the increase but land costs remain consistent with the original prototype height.

Lower density residential developments, such as duplexes and single-family infill were excluded from the analysis.

Root's approach to quantifying height incentives examines the following questions:

1. Can moderate height bonuses achieve greater affordability (i.e., a higher proportion of units affordable to 60% and/or 80% AMI)?
2. What height bonus is needed to increase the proportion of affordable units to the following targets:
 - From 8% to 10% (at 60% AMI) in typical rental submarkets;
 - From 10% to 12% (at 60% AMI) in high cost rental submarkets;
 - From 10% to 12% (at 80% AMI) in typical for-sale submarkets; and
 - From 12% to 15% (at 80% AMI) in high cost for-sale submarkets?

Figure IV-6 summarizes the results in response to the questions posed above. As discussed earlier in this report, incentives must both meet feasibility targets on output metrics but also improve project value and/or profitability in order to be an attractive option for developers.

Figure IV-6.
Height Bonus Analysis Results

			CAN A MODERATE HEIGHT BONUS ACHIEVE GREATER AFFORDABILITY?			WHAT HEIGHT BONUS IS REQUIRED TO ACHIEVE TARGET AFFORDABILITY?		
			Additional Stories	Height with Incentive	Affordability Supported by Incentive	Target Affordability (exceeding baseline)	Additional Stories Needed	Height with Incentive
Prototype	Existing Prototype Height	Baseline Inclusionary (no incentive)						
Typical Submarket								
For-Sale Residential		at 80% AMI	at 80% AMI			at 80% AMI		
5-Story	5	10%	2	7	13%	12%	1	6
12-Story	12	10%	4	16	12%	12%	4	16
Rental Residential		at 60% AMI	at 60% AMI			at 60% AMI		
3-Story	3	8%	1	4	9%	10%	2	5
5-Story	5	8%	2	7	11%	10%	1	6
8-Story	8	8%	4	12	11%	10%	4	12
12-Story	12	8%	4	16	10%	10%	4	16
16-Story	16	8%	4	20	8%	10%	20	36
20-Story	20	8%	10	30	9%	10%	16	36
High Cost Submarket								
For-Sale Residential		at 80% AMI	at 80% AMI			at 80% AMI		
12-Story	12	12%	4	16	15%	15%	4	16
Rental Residential		at 60% AMI	at 60% AMI			at 60% AMI		
8-Story	8	10%	4	12	15%	12%	2	10
12-Story	12	10%	4	16	13%	12%	3	15
16-Story	16	10%	4	20	10%	12%	12	28
20-Story	20	10%	10	30	12%	12%	8	28

Note: The large bonus required to incentivize additional affordability on the 16-story prototype is driven by the different economics of moving to a 20-story development, including the reduced efficiency of point towers. In addition, all prototypes over 12 stories assume the same land cost so there is no "discount" on land resulting from the height bonus. Both a 16-story base and a 20-story base need to reach 35 stories in order to achieve the scale needed to incentivize inclusion of the additional affordable units.

Source: Root Policy Research.

Figure IV-7 provides additional documentation of the analysis in the form of pro forma outputs and percent differences from baseline.

Figure IV-7.
Height Bonus Analysis Detail

Project Outcomes	Typical Submarket						High Cost Submarket				Typical Submarket		High Cost
	3-Story Rental Residential	5-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	5-Story Condo	12-Story Condo	12-Story Condo
Baseline inclusionary, build on-site with no incentives: 8% at 60% AMI							10% at 60% AMI (build on site)				10% at 80% AMI		12% at 80% AMI
Development Summary													
Building Stories	3	5	8	12	16	20	8	12	16	20	5	12	12
Total Residential units	65	140	210	290	320	360	210	290	320	360	95	233	233
Residential Units that are Affordable	5	11	17	23	26	29	21	29	32	36	10	23	28
Total Development Cost	\$20,451,361	\$47,696,521	\$77,190,310	\$105,465,225	\$123,658,174	\$141,671,715	\$80,457,310	\$109,548,975	\$127,741,924	\$145,755,465	\$52,466,980	\$143,016,510	\$148,461,510
Annual Net Operating Income (or Res Sales Value)	\$1,116,930	\$2,616,446	\$4,221,017	\$5,786,952	\$6,802,232	\$7,772,845	\$4,411,048	\$6,049,776	\$7,102,396	\$8,114,607	\$57,090,775	\$157,421,914	\$162,479,437
Annual Net Cash Flow (after debt service)	\$281,846	\$668,869	\$1,069,130	\$1,480,524	\$1,752,938	\$1,988,009	\$1,125,760	\$1,576,598	\$1,886,351	\$2,163,021			
Desirability													
Net Project Value (NOI/Cap Rate - cost of sale)	\$21,891,819	\$51,282,338	\$82,731,942	\$113,424,257	\$133,323,754	\$152,347,756	\$86,456,537	\$118,575,615	\$139,206,963	\$159,046,301	\$55,948,960	\$154,273,476	\$159,229,848
Project Profit	\$1,440,458	\$3,585,818	\$5,541,633	\$7,959,032	\$9,665,580	\$10,676,041	\$5,999,228	\$9,026,640	\$11,465,039	\$13,290,836	\$3,481,980	\$11,256,966	\$10,768,338
Feasibility Summary													
Return on Cost (>5.5% rental 6.5% for-sale)	5.46%	5.49%	5.47%	5.49%	5.50%	5.49%	5.48%	5.52%	5.56%	5.57%	6.64%	7.87%	7.25%
Cash on Cash Return (>6% rental; >12% for-sale)	4.6%	4.7%	4.6%	4.7%	4.73%	4.68%	4.7%	4.8%	4.92%	4.95%	13.3%	13.1%	12.1%
IRR (>10%)	10.43%	10.63%	10.48%	10.64%	10.75%	10.63%	10.60%	10.93%	11.23%	11.29%			
Return on Equity (>6%)	5.6%	5.7%	5.7%	5.8%	5.83%	5.75%	5.7%	5.9%	6.13%	6.17%			
CAN A MODERATE HEIGHT BONUS ACHIEVE GREATER AFFORDABILITY?													
Incentive Summary													
Additional Stories	1	2	4	4	4	10	4	4	4	10	2	4	4
Height with Incentive	4	7	12	16	20	30	12	16	20	30	7	16	16
Affordability Supported by Incentive (at 60% AMI)	9%	11%	11%	10%	8%	9%	15%	13%	10%	12%	13%	12%	15%
Total Residential units	86	196	315	386	400	540	315	386	400	540	133	310	310
Residential Units that are Affordable	8	22	35	39	32	49	47	50	40	65	17	37	47
Percent or bps change from no incentive													
% change in Total Dev. Cost	49%	36%	54%	39%	27%	47%	52%	37%	26%	46%	37%	32%	31%
% change in Net Project Value	50%	37%	56%	39%	27%	48%	53%	38%	27%	46%	37%	32%	31%
% change in project margin	61%	51%	83%	40%	19%	56%	73%	43%	28%	53%	48%	32%	33%
bps change in ROC	2.8 bps	3.7 bps	6.6 bps	0.4 bps	-2.5 bps	2.2 bps	5.3 bps	1.9 bps	0.6 bps	2.3 bps	53.7 bps	2.6 bps	16.4 bps
bps change in COC	9.5 bps	12.2 bps	21.9 bps	1.3 bps	-8.4 bps	7.4 bps	17.8 bps	6.2 bps	2.1 bps	7.7 bps	107.4 bps	4.3 bps	27.3 bps
bps change in IRR	23.5 bps	30.4 bps	54.3 bps	3.3 bps	-21.0 bps	18.3 bps	43.7 bps	15.2 bps	5.1 bps	18.5 bps			
bps change in ROE	14.3 bps	18.4 bps	33.1 bps	2.0 bps	-12.7 bps	11.1 bps	27.2 bps	9.6 bps	3.3 bps	12.0 bps			

Figure IV-7 (continued).
Height Bonus Analysis Detail

RENTAL RESIDENTIAL												FOR-SALE		
Project Outcomes	Typical Submarket						High Cost Submarket				Typical Submarket		High Cost	
	3-Story Rental Residential	5-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	5-Story Condo	12-Story Condo	12-Story Condo	
	WHAT HEIGHT BONUS IS REQUIRED TO ACHIEVE TARGET AFFORDABILITY?													
	Incentive Summary													
Target Affordability (at 60% AMI)	10%	10%	10%	10%	10%	10%	12%	12%	12%	12%	12%	12%	15%	
Additional Stories Needed	2	1	4	4	20	16	2	3	12	8	1	4	4	
Height with Incentive	5	6	12	16	36	36	10	15	28	28	6	16	16	
Total Residential units	120	168	338	386	720	648	263	363	560	504	114	310	310	
Residential Units that are Affordable	12	17	34	39	72	65	32	44	67	60	14	37	47	
Percent or bps change from no incentive														
% change in Total Dev. Cost	86%	18%	54%	39%	124%	75%	23%	28%	73%	37%	18%	31%	30%	
% change in Net Project Value	94%	18%	57%	39%	122%	75%	23%	29%	73%	37%	18%	31%	30%	
% change in project margin	210%	22%	100%	40%	105%	77%	24%	31%	75%	39%	21%	31%	33%	
bps change in ROC	23.9 bps	1.2 bps	10.4 bps	0.4 bps	-3.1 bps	0.3 bps	0.4 bps	1.0 bps	0.5 bps	0.8 bps	14.1 bps	1.1 bps	14.0 bps	
bps change in COC	79.5 bps	4.1 bps	34.8 bps	1.3 bps	-10.4 bps	1.0 bps	1.2 bps	3.2 bps	1.5 bps	2.5 bps	28.1 bps	1.9 bps	23.4 bps	
bps change in IRR	191.3 bps	10.2 bps	85.7 bps	3.3 bps	-25.8 bps	2.5 bps	3.0 bps	7.8 bps	3.7 bps	6.1 bps				
bps change in ROE	124.3 bps	6.1 bps	53.0 bps	2.0 bps	-15.6 bps	1.5 bps	1.9 bps	4.9 bps	2.4 bps	3.9 bps				

Note: The large bonus required to incentivize additional affordability on the 16-story prototype is driven by the different economics of moving to a 20-story development, including the reduced efficiency of point towers. In addition, all prototypes over 12 stories assume the same land cost so there is no “discount” on land resulting from the height bonus. Both a 16-story base and a 20-story base need to reach 35 stories in order to achieve the scale needed to incentivize inclusion of the additional affordable units.

Source: Root Policy Research.

Case Study—Cumulative Benefit of Incentive Package

Figure IV-8 illustrates the cumulative benefit the incentives described in this section using the 5-story rental residential prototype as a case study. The case study adds each incentive cumulatively—for example, the parking reduction column shows the benefit of both the parking reduction and the fee reduction, and the height bonus shows the benefit of all three incentives. The incentive outcomes are compared to the baseline, on-site inclusionary requiring 8% of units be affordable to 60% AMI. The height bonus requires additional affordability (10% of units affordable to 60% AMI).

Collectively, these incentives improve the project margin by 61% (from \$3.6 million to \$5.8 million) and increase feasibility metrics by a range of 11 to 198 basis points.

Figure IV-8.
Cumulative Benefit of Incentives to 5-Story Rental Residential Prototype

Key Project Outcomes	BASELINE: On-Site Inclusionary (8% @ 60% AMI)	CUMULATIVE CHANGE FROM BASELINE		
		Fee Reduction (\$6,500 per affordable unit)	Parking Reduction (to 0.5 per unit)	2-Story Height Bonus (additional affordability: 10% @ 60% AMI)
Development Summary				
Building Stories	5	5	5	7
Total Residential units	140	140	140	186
Affordable Units (60% AMI)	11	11	11	19
Development Cost and Profit		Percent change from baseline		
Total Development Cost	\$47,696,521	-0.2%	-4.7%	24.4%
Annual Net Operating Income	\$2,616,446	0.0%	-3.1%	26.9%
Annual Net Cash Flow	\$668,869	0.5%	1.7%	34.3%
Net Project Value	\$51,282,338	0.0%	-3.1%	26.9%
Project Margin	\$3,585,818	2.2%	18.7%	60.6%
Feasibility Summary		Basis point change from baseline		
Return on Cost	5.5%	1 bps	9 bps	11 bps
Cash on Cash Return	4.7%	3 bps	31 bps	37 bps
IRR (7-year hold)	10.6%	7 bps	77 bps	198 bps
Return on Equity (Year 5)	5.7%	5 bps	48 bps	57 bps

Source: Root Policy Research.

APPENDIX A.

DEVELOPMENT PATTERNS AND MARKET RENTS

APPENDIX A.

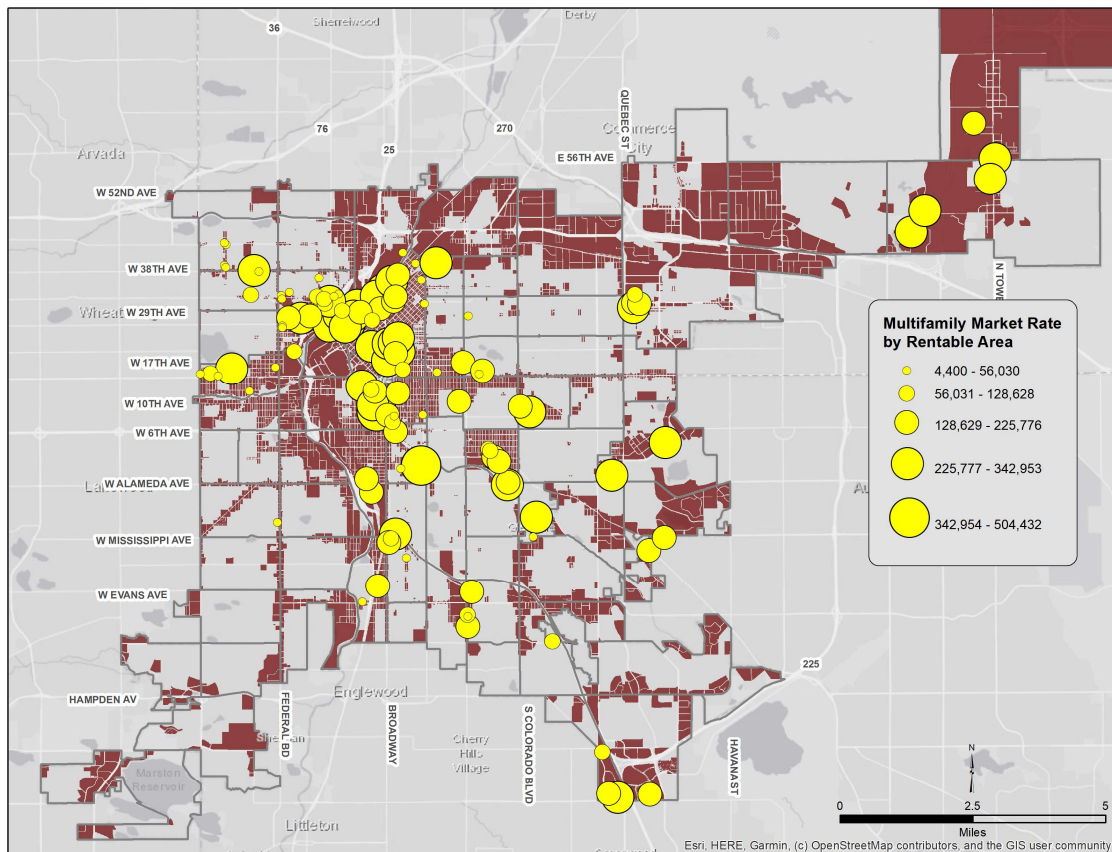
Development Patterns and Market Rents

This appendix supplements Section I with additional detail on the geographic dispersion of recent development and presentation of market-rate rents by submarket (in both dollars per unit and by affordability to a percent of area median income, or AMI).

Geographic Dispersion of Recent Development

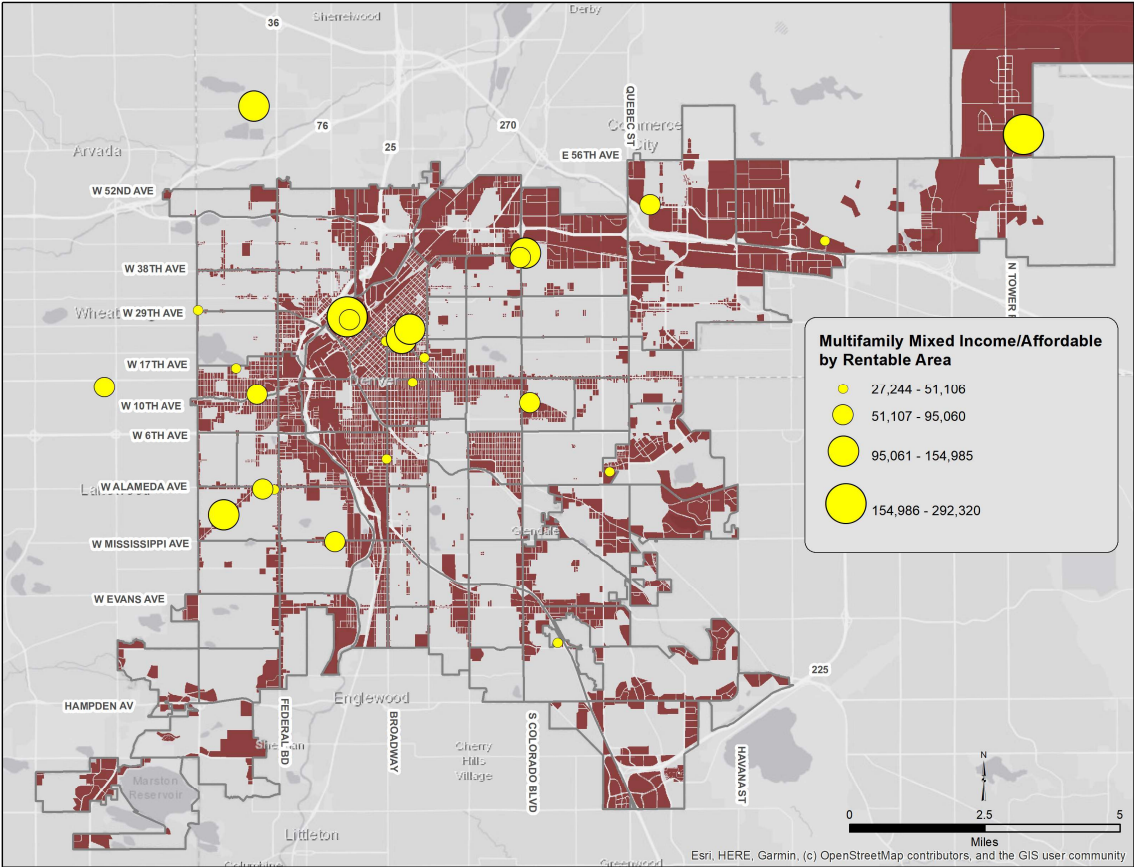
Recent multifamily and commercial development has generally occurred in alignment with the Blueprint Denver growth strategy. Multifamily and office projects are concentrated in the downtown core and adjacent neighborhoods. Figure I-2 maps recent multifamily and commercial developments by type and size.

Figure A-1.
Multifamily Market-Rate Rental Developments, Built 2015-2019



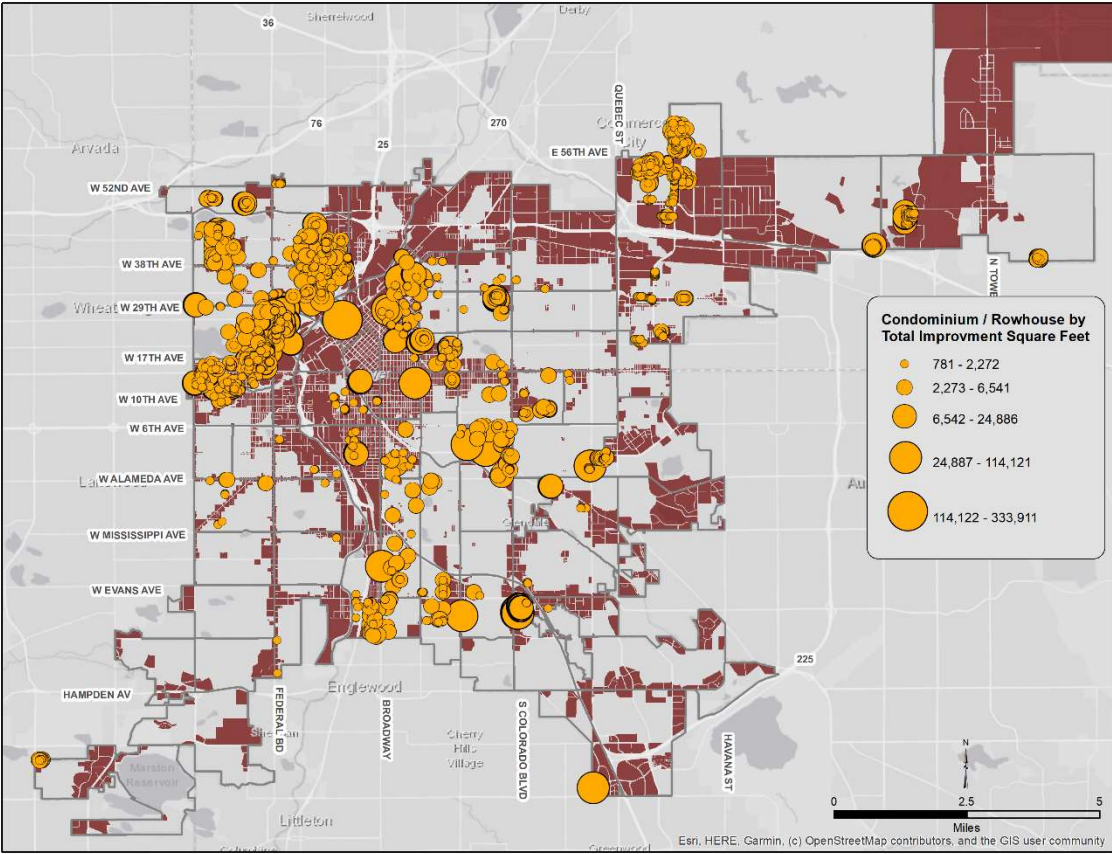
Source: Denver County Assessor's Office and ArLand Land Use Economics.

Figure A-2.
Multifamily Mixed-Income/Affordable Developments, Built 2015-2019



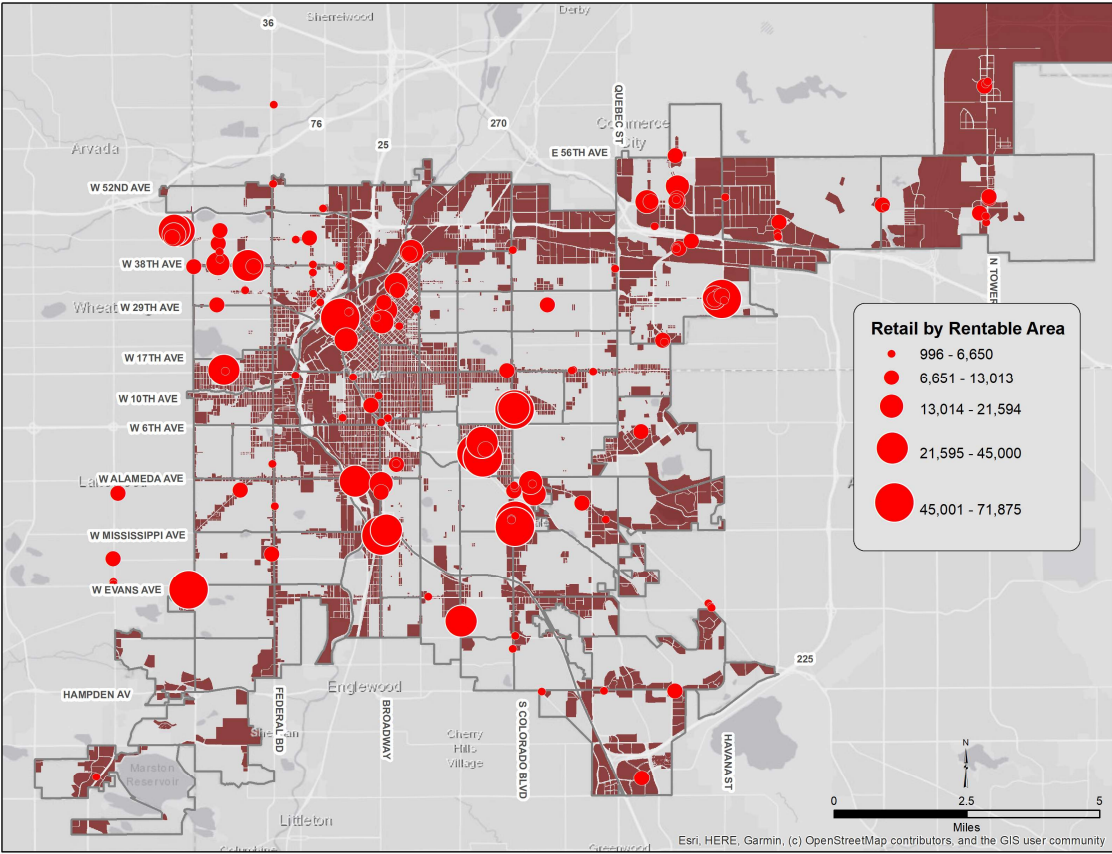
Source: Denver County Assessor's Office and ArLand Land Use Economics.

Figure A-3.
Multifamily Market-Rate For-Sale Developments, Built 2015-2019



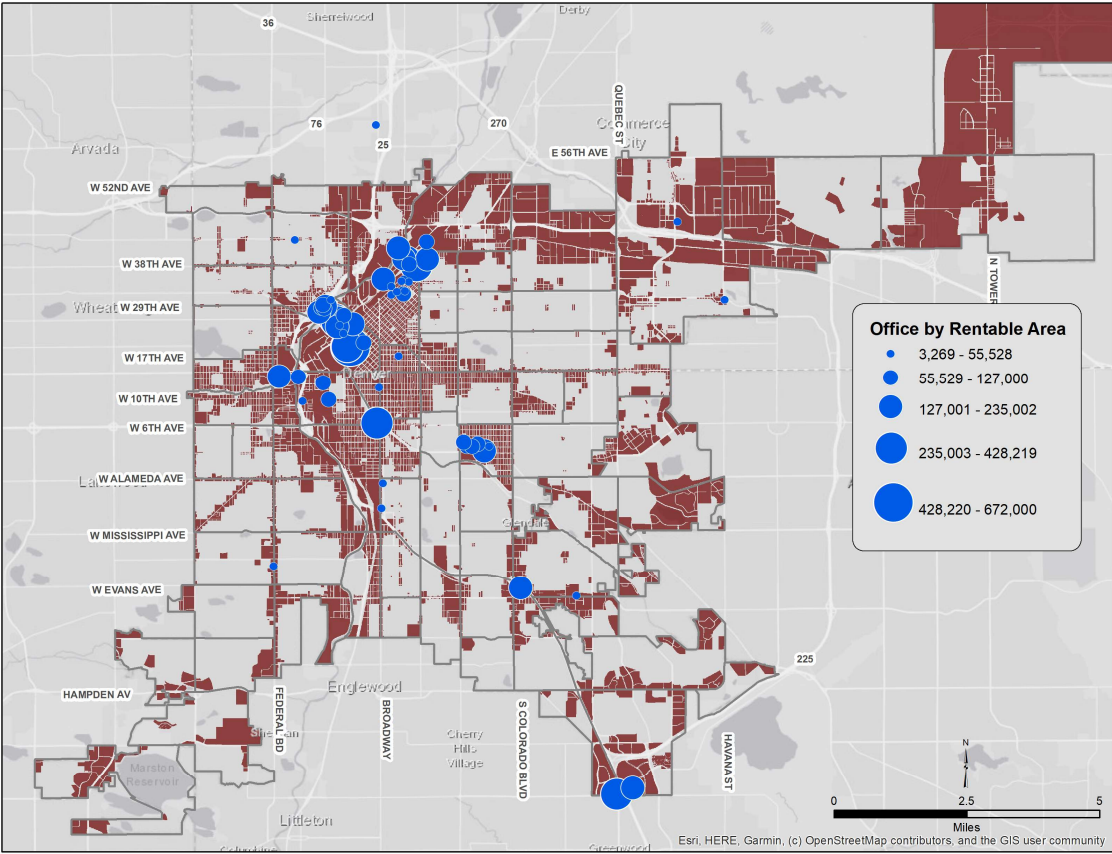
Source: Denver County Assessor's Office and ArLand Land Use Economics.

Figure A-4.
Retail Developments, Built 2015-2019



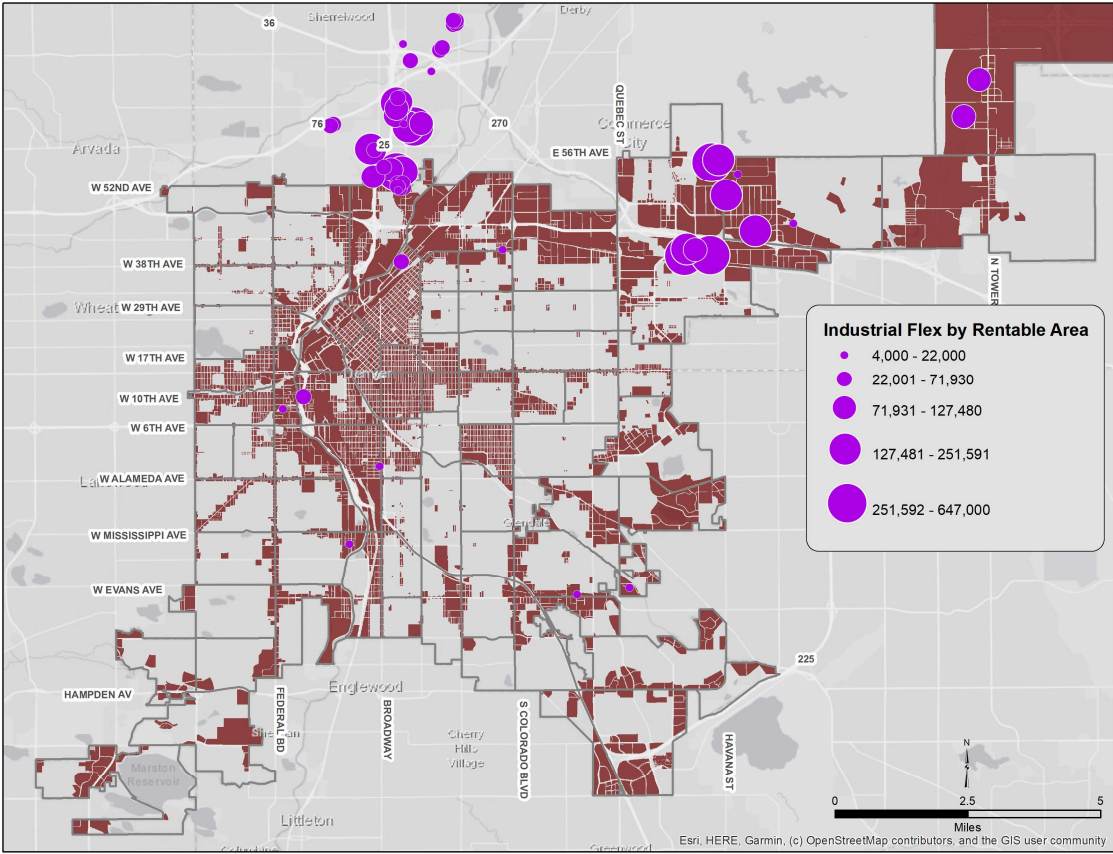
Source: Denver County Assessor’s Office and ArLand Land Use Economics.

Figure A-5.
Office Developments, Built 2015-2019



Source: Denver County Assessor’s Office and ArLand Land Use Economics.

Figure A-6.
Industrial and Flex Developments, Built 2015-2019



Source: Denver County Assessor's Office and ArLand Land Use Economics.

Market Rents

As discussed in Section I, estimated multifamily rents at development occupancy range from \$2.34 per square foot to \$3.08 per square foot on average (depending on building height). Figure A-7 shows the per unit market rents by prototype and submarket along with the household AMI to which those rents are naturally affordable.

Figure A-7.
Market Rate Rents by Submarket and Affordability

Submarket and Prototype	MARKET RATE RENTS (\$/MONTH)				MARKET RATE RENTS (% OF AMI)			
	Studio (1 per hh)	1 Bedroom (1-2 per hh)	2 Bedroom (3-4 per hh)	3 Bedroom (5-6 per hh)	Studio (1 per hh)	1 Bedroom (1-2 per hh)	2 Bedroom (3-4 per hh)	3 Bedroom (5-6 per hh)
Typical Submarket								
3-Story market rent	\$1,482	\$1,861	\$2,631	\$3,278	85% AMI	100% AMI	118% AMI	127% AMI
5-Story market rent	\$1,574	\$1,991	\$2,813	\$3,555	90% AMI	107% AMI	126% AMI	138% AMI
8-Story market rent	\$1,582	\$2,030	\$2,965	\$3,967	90% AMI	109% AMI	132% AMI	154% AMI
12-Story market rent	\$1,696	\$2,178	\$3,180	\$4,256	97% AMI	117% AMI	142% AMI	165% AMI
16-Story market rent	\$1,779	\$2,283	\$3,334	\$4,462	102% AMI	122% AMI	149% AMI	173% AMI
20-Story market rent	\$1,808	\$2,321	\$3,389	\$4,535	103% AMI	124% AMI	151% AMI	176% AMI
High Cost Submarket								
8-Story market rent	\$1,661	\$2,132	\$3,113	\$4,166	95% AMI	114% AMI	139% AMI	162% AMI
12-Story market rent	\$1,781	\$2,287	\$3,339	\$4,468	102% AMI	122% AMI	149% AMI	174% AMI
16-Story market rent	\$1,868	\$2,398	\$3,501	\$4,685	107% AMI	128% AMI	156% AMI	182% AMI
20-Story market rent	\$1,898	\$2,437	\$3,559	\$4,762	108% AMI	130% AMI	159% AMI	185% AMI

Source: Root Policy Research.

Industry Engagement for Proforma Development

Development of the Feasibility Model (Model) was joint effort between Root Policy Research and ArLand Land Use Economics. The model is informed by market data on building costs and rents and incorporates variations by both geographic submarket and variations by development prototype/height. Underlying assumptions have also been calibrated through extensive stakeholder vetting.

Specific to this report, stakeholder outreach included:

- Seventeen interviews with residential and commercial developers (both market rate and affordable), lenders, and architects active in the Denver market;
- Six focus groups¹ in which specific assumptions related to rent levels, building costs, soft costs, financing costs, and measures of return used to evaluate project outcomes were shared and discussed with developers; and
- Multiple developers also shared specific recent project costs, estimates on current/planned developments, and recent proformas. Engagement was conducted in both 2020 (under the Affordable Housing Zoning Incentive project) and in May and July 2021 under the revised approach of the current EHA project.

Root made the following proforma adjustments as a result of specific developer feedback:

- | | |
|---|---|
| ■ Increased building costs per square foot across prototypes | ■ Reduced sale price of single unit and townhomes |
| ■ Adjusted land cost range to include higher cost parcels | ■ Adjusted ROC target |
| ■ Increased costs of tenant improvements on non-residential space/buildings | ■ Increased building costs and parking costs |
| ■ Reduced expected rents for low to mid-rise buildings | ■ Increased rents |
| ■ Adjusted developer profit assumptions | ■ Increased tenant finish costs |
| ■ Adjusted lending assumptions (interest rate and term) | ■ Increased OPEX and replacement reserves |
| ■ Replaced Residual Land Value (RLV) with cash-on-cash as an output metric | ■ Increased land cost for 4-8 story prototypes (low and mid rise) |
| | ■ Increased permanent loan interest rate to 4.15% |

¹ Focus groups were held on 5/18/2021, 5/26/2021 and 9/8/2021 and 9/9/2021.

- Changed Cash on Cash targets to 6% for rental residential and 12% for owner residential
- Increased cap rates for office prototypes of 5 or more stories
- Slight increase in 12-story condo building cost
- Adjusted IRR to reflect leveraged IRR (and modified feasibility target accordingly)
- Increased parcel size of 3-story rental residential.

Additional outreach related to this effort can be found on the project website.

APPENDIX B.

LINKAGE FEE PROFORMAS

APPENDIX B.

Linkage Fee Proformas

This appendix provides the detailed proformas used to test linkage fee increases. The following proformas demonstrate financial feasibility of a \$9.60 psf single unit fee, a \$14 psf townhome fee, a \$7.00 psf commercial fee, and a \$6.00 psf industrial fee in a typical submarket. Proformas are also included for an \$11psf commercial fee in a high cost submarket (for 8+ story developments).

Figure B-1.

Typical Submarket: \$9.6 Single Unit fee, \$14 Townhome Fee, \$7.00 Commercial Fee, and \$6.00 Industrial Fee

SITE & PROTOTYPE ASSUMPTIONS	For-Sale Res		Office					Hotel		Retail	Warehouse
	Single Unit	For-Sale Townhomes	3-Story	5-Story	8-Story	12-Story	16-Story	4-Story	12-Story	1-Story	Warehouse
Parcel Description											
Parcel Size (Acres)	0.12	0.41	0.75	0.75	0.75	0.75	0.75	2.00	1.00	1.00	8.00
Building Stories	2	3	3	5	8	12	16	4	12	1	1
Total Building Gross Sq.Ft. (excl. parking)	2,700	21,700	32,600	60,900	149,863	169,663	260,663	66,700	109,700	10,500	100,000
Total Parking Sq.Ft. (excl. surface parking)	0	0	0	31,668	75,192	85,488	132,808	0	57,281	0	0
Total Residential units	1	10	0	0	0	0	0	143	235	0	0
Primary Use											
Number of Residential Units/ Hotel Rooms	1	10	0	0	0	0	0	143	235	0	0
Total Net Leasable Area	2,570	19,500	30,000	56,000	133,000	151,250	235,000	50,050	82,250	10,000	100,000
Efficiency Rate (GLA/Gross Sq.Ft.)	95%	90%	92%	92%	92%	92%	92%	75%	75%	95%	100%
Use #1 Gross Building Sq.Ft.	2,700	21,700	32,600	60,900	144,600	164,400	255,400	66,700	109,700	10,500	100,000
Secondary Use: Retail											
Total Net Leasable Area					5,000	5,000	5,000				
Efficiency Rate (GLA/Gross Sq.Ft.)					95%	95%	95%				
Use #2 Gross Building Sq.Ft.					5,263	5,263	5,263				
Parking											
Garage (single family and townhomes)	2	10	0	0	0	0	0	0	0	0	0
Surface spaces	0	0	52	0	0	0	0	107	0	79	83
Tuck under spaces	0	0	0	0	0	0	0	0	58	0	0
Structured spaces	0	0	0	34	58	39	61	0	58	0	0
Underground spaces	0	0	0	63	174	224	348	0	60	0	0
CAPITAL COSTS											
LAND COST											
Total Land Cost	\$210,000	\$900,000	\$1,633,500	\$1,633,500	\$3,267,000	\$5,717,250	\$5,717,250	\$8,712,000	\$7,623,000	\$348,480	\$2,787,840
HARD COSTS (HC)											
Total Primary Use Building Cost	\$405,789	\$3,705,000	\$6,345,652	\$12,831,304	\$37,174,946	\$43,607,677	\$69,312,228	\$15,994,926	\$33,946,361	\$2,065,789	\$13,300,000
Total Secondary Use Building Cost					\$1,032,895	\$1,032,895	\$1,032,895				
Sites, Site Prep, Landscaping	\$16,232	\$185,250	\$227,283	\$473,565	\$1,359,642	\$1,608,279	\$2,558,506	\$799,746	\$1,697,318	\$65,789	\$515,000
Parking Construction Costs	\$21,000	\$105,000	\$208,640	\$4,043,760	\$9,832,800	\$11,445,998	\$17,781,678	\$429,000	\$5,313,938	\$316,000	\$332,000
Total Hard Costs	\$443,021	\$3,995,250	\$6,781,575	\$17,348,630	\$49,400,282	\$57,694,848	\$90,685,307	\$17,223,673	\$40,957,616	\$2,447,579	\$14,147,000
SOFT COSTS											
Soft Costs (excluding linkage)	\$70,883	\$699,169	\$1,186,776	\$3,122,753	\$9,633,055	\$11,250,495	\$17,683,635	\$3,358,616	\$7,986,735	\$477,278	\$2,758,665
Primary Use Linkage Fee	\$25,920	\$303,800	\$228,200	\$426,300	\$1,012,200	\$1,150,800	\$1,787,800	\$466,900	\$767,900	\$73,500	\$600,000
Secondary Use Linkage Fee					\$73,684	\$73,684	\$73,684				
Total Soft Costs	\$96,803	\$1,002,969	\$1,414,976	\$3,549,053	\$10,718,939	\$12,474,980	\$19,545,119	\$3,825,516	\$8,754,635	\$550,778	\$3,358,665
CONSTRUCTION FINANCING COSTS											
Total Construction Financing Costs	\$15,205	\$184,101	\$337,425	\$950,845	\$2,995,941	\$3,800,866	\$6,926,145	\$866,525	\$2,908,167	\$116,936	\$455,147
CONTINGENCY											
Contingency	\$21,593	\$199,929	\$327,862	\$835,907	\$2,404,769	\$2,806,793	\$4,409,217	\$841,968	\$1,988,490	\$119,934	\$700,227
TOTAL DEVELOPMENT COST	\$786,622	\$6,282,249	\$10,495,337	\$24,317,935	\$68,786,932	\$82,494,736	\$127,283,038	\$31,469,681	\$62,231,908	\$3,583,707	\$21,448,879

Note: See Section I for explanation of assumptions.

Source: Root Policy Research.

Figure B-1 (continued).

Typical Submarket: \$9.6 Single Unit fee, \$14 Townhome Fee, \$7.00 Commercial Fee, and \$6.00 Industrial Fee

SITE & PROTOTYPE ASSUMPTIONS	For-Sale Res		Office					Hotel		Retail	Warehouse
	Single Unit	For-Sale Townhomes	3-Story	5-Story	8-Story	12-Story	16-Story	4-Story	12-Story	1-Story	Warehouse
REVENUES & OPERATING EXPENSES											
Primary Use											
Annual Lease/Sales Revenue	\$865,000	\$6,830,000	\$1,117,500	\$2,298,800	\$5,925,150	\$7,078,500	\$11,080,250	\$9,134,125	\$18,441,625	\$415,000	\$1,670,000
Misc. Revenue			\$6,000	\$19,600	\$46,550	\$52,938	\$82,250	\$650,650	\$1,069,250	\$0	\$0
Less: Vacancy Allowance			(\$78,645)	(\$161,129)	(\$415,033)	(\$495,635)	(\$775,794)	(\$2,690,813)	(\$5,365,491)	(\$62,250)	(\$70,975)
Effective Gross Income (excl parking)	\$865,000	\$6,830,000	\$1,044,855	\$2,157,271	\$5,556,667	\$6,635,803	\$10,386,706	\$7,093,962	\$14,145,384	\$352,750	\$1,599,025
Secondary Use											
Lease/Sales Revenue					\$210,000	\$210,000	\$210,000				
Less: Vacancy Allowance					(\$21,000)	(\$21,000)	(\$21,000)				
Effective Gross Income					\$189,000	\$189,000	\$189,000				
Parking Revenue											
Parking Revenue	\$0	\$0	\$0	\$58,464	\$138,816	\$157,824	\$245,184	\$0	\$0	\$0	\$0
Less: Vacancy Allowance			\$0	(\$4,063)	(\$9,648)	(\$10,969)	(\$17,040)	\$0	\$0	\$0	\$0
Effective Gross Income	\$0	\$0	\$0	\$54,401	\$129,168	\$146,855	\$228,144	\$0	\$0	\$0	\$0
Less Operating Expenses & Replacement Reserve											
Primary Use Annual Operating Exp			(\$390,000)	(\$728,000)	(\$1,729,000)	(\$1,966,250)	(\$3,055,000)	(\$4,567,063)	(\$9,220,813)	(\$130,000)	(\$310,000)
Primary Use Replacement Reserve			(\$28,500)	(\$53,200)	(\$126,350)	(\$143,688)	(\$223,250)	(\$50,050)	(\$82,250)	(\$10,000)	(\$25,000)
Total expenses and replacement reserve	\$0	\$0	(\$418,500)	(\$781,200)	(\$1,855,350)	(\$2,109,938)	(\$3,278,250)	(\$4,617,113)	(\$9,303,063)	(\$140,000)	(\$335,000)
Net Operating Income (NOI) or Res Sales Rev	\$865,000	\$6,830,000	\$626,355	\$1,430,472	\$4,019,485	\$4,861,720	\$7,525,600	\$2,476,849	\$4,842,322	\$212,750	\$1,264,025
VALUATION CALCULATIONS											
Return on Cost	8.9%	6.5%	6.0%	5.9%	5.8%	5.9%	5.9%	7.9%	7.8%	5.9%	5.9%
Cash on Cash Return	29.5%	21.8%	6.3%	6.0%	5.9%	6.0%	6.1%	12.6%	12.3%	6.2%	6.0%
Internal Rate of Return (IRR)			10.1%	9.4%	9.1%	9.5%	9.7%	16.6%	16.0%	11.3%	10.9%
ROE (year 5)			8.4%	7.9%	7.7%	8.0%	8.1%	25.5%	24.3%	8.2%	8.0%

Note: See Section I for explanation of assumptions.

Source: Root Policy Research.

Figure B-2.
High Cost Submarket: \$11.00psf Commercial Fee

SITE & PROTOTYPE ASSUMPTIONS	Office			Hotel
	8-Story	12-Story	16-Story	12-Story
Parcel Description				
Parcel Size (Acres)	0.75	0.75	0.75	1.00
Building Stories	8	12	16	12
Total Building Gross Sq.Ft. (excl. parking)	149,863	169,663	260,663	109,700
Total Parking Sq.Ft. (excl. surface parking)	75,192	85,488	132,808	57,281
Primary Use				
Number of Residential Units/ Hotel Rooms	0	0	0	235
Total Net Leasable Area	133,000	151,250	235,000	82,250
Efficiency Rate (GLA/Gross Sq.Ft.)	92%	92%	92%	75%
Use #1 Gross Building Sq.Ft.	144,600	164,400	255,400	109,700
Secondary Use: Retail				
Total Net Leasable Area	5,000	5,000	5,000	
Efficiency Rate (GLA/Gross Sq.Ft.)	95%	95%	95%	
Use #2 Gross Building Sq.Ft.	5,263	5,263	5,263	
Parking				
Tuck under spaces	0	0	0	58
Structured spaces	58	39	61	58
Underground spaces	174	224	348	60
CAPITAL COSTS				
LAND COST				
Total Land Cost	\$6,534,000	\$9,801,000	\$9,801,000	\$13,068,000
HARD COSTS (HC)				
Total Primary Use Building Cost	\$37,174,946	\$43,607,677	\$69,312,228	\$33,946,361
Total Secondary Use Building Cost	\$1,032,895	\$1,032,895	\$1,032,895	
Sites, Site Prep, Landscaping	\$1,359,642	\$1,608,279	\$2,558,506	\$1,697,318
Parking Construction Costs	\$9,832,800	\$11,445,998	\$17,781,678	\$5,313,938
Total Hard Costs	\$49,400,282	\$57,694,848	\$90,685,307	\$40,957,616
SOFT COSTS				
Soft Costs (excluding linkage)	\$9,633,055	\$11,250,495	\$17,683,635	\$7,986,735
Primary Use Linkage Fee	\$1,590,600	\$1,808,400	\$2,809,400	\$1,206,700
Secondary Use Linkage Fee	\$73,684	\$73,684	\$73,684	
Total Soft Costs	\$11,297,339	\$13,132,580	\$20,566,719	\$9,193,435
CONSTRUCTION FINANCING COSTS				
Total Construction Financing Costs	\$3,024,765	\$3,836,486	\$6,990,336	\$2,933,837
CONTINGENCY				
Contingency	\$2,427,905	\$2,833,097	\$4,450,081	\$2,006,042
TOTAL DEVELOPMENT COST	\$72,684,291	\$87,298,010	\$132,493,443	\$68,158,930
REVENUES & OPERATING EXPENSES				
Primary Use				
Annual Lease/Sales Revenue	\$6,221,408	\$7,432,425	\$11,634,263	\$19,363,706
Misc. Revenue	\$46,550	\$52,938	\$82,250	\$1,069,250
Less: Vacancy Allowance	(\$435,623)	(\$520,233)	(\$814,298)	(\$5,619,063)
Effective Gross Income (excl parking)	\$5,832,334	\$6,965,130	\$10,902,215	\$14,813,893
Secondary Use				
Lease/Sales Revenue	\$210,000	\$210,000	\$210,000	
Less: Vacancy Allowance	(\$21,000)	(\$21,000)	(\$21,000)	
Effective Gross Income	\$189,000	\$189,000	\$189,000	
Parking Revenue				
Parking Revenue	\$138,816	\$157,824	\$245,184	\$0
Less: Vacancy Allowance	(\$9,648)	(\$10,969)	(\$17,040)	\$0
Effective Gross Income	\$129,168	\$146,855	\$228,144	\$0
Less Operating Expenses & Replacement Reserve				
Primary Use Annual Operating Exp	(\$1,729,000)	(\$1,966,250)	(\$3,055,000)	(\$9,681,853)
Primary Use Replacement Reserve	(\$126,350)	(\$143,688)	(\$223,250)	(\$82,250)
Total expenses and replacement reserve	(\$1,855,350)	(\$2,109,938)	(\$3,278,250)	(\$9,764,103)
Net Operating Income (NOI) or Res Sales Rev	\$4,295,153	\$5,191,048	\$8,041,109	\$5,049,790
VALUATION CALCULATIONS				
Return on Cost	5.9%	5.9%	6.1%	7.4%
Cash on Cash Return	6.1%	6.2%	6.6%	11.1%
Internal Rate of Return (IRR)	9.7%	10.0%	10.9%	13.6%
ROE (year 5)	8.0%	8.3%	9.0%	19.9%

Note: See Section I for explanation of assumptions.

Source: Root Policy Research.

APPENDIX C.

INCLUSIONARY HOUSING PROFORMAS

APPENDIX C.

Inclusionary Housing Proformas

This appendix provides the detailed proformas used to test inclusionary housing alternatives. The following proformas demonstrate financial feasibility of the following inclusionary housing options:

Rental residential:

- At 60% AMI: 8% of units in typical submarkets and 10% in high cost submarkets; and
- At 80% AMI: 12% of units in typical submarkets and 15% in high cost submarkets.

For-sale residential:

- At 80% AMI: 10% of units in typical submarkets and 12% in high cost submarkets; and
- At 100% AMI: 12% of units in typical submarkets and 15% in high cost submarkets.

Figure C-1.
Rental Residential Proformas, Typical and High Cost Submarkets, Affordability at 60% AMI

SITE & PROTOTYPE ASSUMPTIONS	Typical Submarket: 8% affordable @ 60% AMI						High Cost Submarket: 10% aff @ 60% AMI			
	3-Story Rental Residential	5-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential	8-Story Rental Residential	12-Story Rental Residential	16-Story Rental Residential	20-Story Rental Residential
Parcel Description										
Parcel Size (Acres)	1.20	1.00	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Building Stories	3	5	8	12	16	20	8	12	16	20
Total Building Gross Sq.Ft. (excl. parking)	66,600	137,400	211,363	270,263	302,926	335,726	211,363	270,263	302,926	335,726
Total Parking Sq.Ft. (excl. surface parking)	0	34,808	51,188	70,688	78,000	87,750	51,188	70,688	78,000	87,750
Total Residential units	65	140	210	290	320	360	210	290	320	360
Primary Use										
Total Net Leasable Area	56,391	109,995	164,993	212,106	234,048	263,304	161,406	207,495	228,960	257,580
Efficiency Rate (GLA/Gross Sq.Ft.)	92%	87%	87%	87%	87%	88%	87%	87%	87%	88%
Use #1 Gross Building Sq.Ft.	61,300	126,400	189,600	243,800	269,000	299,200	185,500	238,500	263,200	292,700
Optional Use: Affordable Housing										
Number of Affordable Units	5	11	17	23	26	29	21	29	32	36
Total Net Leasable Area	4,904	9,565	14,347	18,444	20,352	22,896	17,934	23,055	25,440	28,620
Efficiency Rate (GLA/Gross Sq.Ft.)	92%	87%	87%	87%	87%	88%	87%	87%	87%	88%
Use #2 Gross Building Sq.Ft.	5,300	11,000	16,500	21,200	23,400	26,000	20,600	26,500	29,200	32,500
Secondary Use: Retail										
Total Net Leasable Area			5,000	5,000	10,000	10,000	5,000	5,000	10,000	10,000
Efficiency Rate (GLA/Gross Sq.Ft.)			95%	95%	95%	95%	95%	95%	95%	95%
Use #2 Gross Building Sq.Ft.			5,263	5,263	10,526	10,526	5,263	5,263	10,526	10,526
Parking										
Garage (single family and townhomes)	0	0	0	0	0	0	0	0	0	0
Surface spaces	65	19	0	0	0	0	0	0	0	0
Tuck under spaces	0	0	0	0	0	0	0	0	0	0
Structured spaces	0	107	118	163	144	135	118	163	144	135
Underground spaces	0	0	39	54	96	135	39	54	96	135
CAPITAL COSTS										
LAND COST										
Total Land Cost	\$2,613,600	\$4,356,000	\$3,267,000	\$5,717,250	\$5,717,250	\$5,717,250	\$6,534,000	\$9,801,000	\$9,801,000	\$9,801,000
HARD COSTS (HC)										
Total Primary Use Building Cost (excl. aff. units)	\$12,075,115	\$26,171,272	\$43,618,786	\$58,755,800	\$68,331,255	\$78,691,991	\$42,670,552	\$57,478,500	\$66,845,793	\$76,981,295
Total Secondary Use Building Cost			\$1,032,895	\$1,032,895	\$2,065,789	\$2,065,789	\$1,032,895	\$1,032,895	\$2,065,789	\$2,065,789
Affordable Housing Building Costs	\$1,050,010	\$2,275,763	\$3,792,938	\$5,109,200	\$5,941,848	\$6,842,782	\$4,741,172	\$6,386,500	\$7,427,310	\$8,553,477
Sites, Site Prep, Landscaping	\$656,256	\$1,422,352	\$2,403,481	\$3,226,145	\$3,779,445	\$4,342,528	\$2,403,481	\$3,226,145	\$3,779,445	\$4,342,528
Parking Construction Costs	\$260,000	\$3,824,100	\$5,906,250	\$8,156,250	\$9,360,000	\$10,800,000	\$5,906,250	\$8,156,250	\$9,360,000	\$10,800,000
Total Hard Costs	\$14,041,381	\$33,693,486	\$56,754,350	\$76,280,289	\$89,478,338	\$102,743,090	\$56,754,350	\$76,280,289	\$89,478,338	\$102,743,090
SOFT COSTS										
Soft Costs (excluding linkage)	\$2,457,242	\$6,233,295	\$11,067,098	\$14,874,656	\$17,448,276	\$20,034,903	\$11,067,098	\$14,874,656	\$17,448,276	\$20,034,903
Primary Use Linkage Fee	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Secondary Use Linkage Fee			\$8,474	\$8,474	\$16,947	\$16,947	\$8,474	\$8,474	\$16,947	\$16,947
Total Soft Costs	\$2,457,242	\$6,233,295	\$11,075,572	\$14,883,130	\$17,465,223	\$20,051,850	\$11,075,572	\$14,883,130	\$17,465,223	\$20,051,850
CONSTRUCTION FINANCING COSTS										
Total Construction Financing Costs	\$679,193	\$1,816,669	\$3,380,191	\$4,938,019	\$6,719,620	\$8,247,727	\$3,380,191	\$4,938,019	\$6,719,620	\$8,247,727
CONTINGENCY										
Contingency	\$659,945	\$1,597,071	\$2,713,197	\$3,646,537	\$4,277,742	\$4,911,798	\$2,713,197	\$3,646,537	\$4,277,742	\$4,911,798
TOTAL DEVELOPMENT COST	\$20,451,361	\$47,696,521	\$77,190,310	\$105,465,225	\$123,658,174	\$141,671,715	\$80,457,310	\$109,548,975	\$127,741,924	\$145,755,465
REVENUES & OPERATING EXPENSES										
Primary Use										
Annual Lease/Sales Revenue	\$1,583,471	\$3,392,252	\$5,266,570	\$7,355,836	\$8,509,985	\$9,731,716	\$5,409,683	\$7,555,723	\$8,741,235	\$9,996,165
Misc. Revenue	\$14,352	\$77,280	\$173,880	\$256,128	\$282,624	\$317,952	\$170,100	\$250,560	\$276,480	\$311,040
Less: Vacancy Allowance	(\$79,891)	(\$173,477)	(\$272,023)	(\$380,598)	(\$439,630)	(\$502,483)	(\$278,989)	(\$390,314)	(\$450,886)	(\$515,360)
Effective Gross Income (excl parking)	\$1,517,931	\$3,296,055	\$5,168,428	\$7,231,366	\$8,352,979	\$9,547,184	\$5,300,794	\$7,415,969	\$8,566,829	\$9,791,844
Secondary Use										
Lease/Sales Revenue			\$210,000	\$210,000	\$420,000	\$420,000	\$210,000	\$210,000	\$420,000	\$420,000
Less: Vacancy Allowance			(\$21,000)	(\$21,000)	(\$42,000)	(\$42,000)	(\$21,000)	(\$21,000)	(\$42,000)	(\$42,000)
Effective Gross Income			\$189,000	\$189,000	\$378,000	\$378,000	\$189,000	\$189,000	\$378,000	\$378,000
Affordable Housing										
Annual Lease/Sales Revenue	\$73,867	\$153,457	\$230,185	\$311,075	\$343,255	\$386,162	\$287,732	\$388,844	\$429,069	\$482,702
Misc. Revenue	\$832	\$4,480	\$10,080	\$14,848	\$16,384	\$18,432	\$12,600	\$18,560	\$20,480	\$23,040
Less: Vacancy Allowance	(\$2,988)	(\$6,317)	(\$9,611)	(\$13,037)	(\$14,386)	(\$16,184)	(\$12,013)	(\$16,296)	(\$17,982)	(\$20,230)
Effective Gross Income (excl parking)	\$71,711	\$151,619	\$230,655	\$312,886	\$345,254	\$388,410	\$288,319	\$391,108	\$431,567	\$485,513
Parking Revenue										
Parking Revenue	\$0	\$192,780	\$283,500	\$391,500	\$432,000	\$486,000	\$283,500	\$391,500	\$432,000	\$486,000
Less: Vacancy Allowance	\$0	(\$9,639)	(\$14,175)	(\$19,575)	(\$21,600)	(\$24,300)	(\$14,175)	(\$19,575)	(\$21,600)	(\$24,300)
Effective Gross Income	\$0	\$183,141	\$269,325	\$371,925	\$410,400	\$461,700	\$269,325	\$371,925	\$410,400	\$461,700
Less Operating Expenses & Replacement Reserve										
Primary Use Annual Operating Exp (incl aff units)	(\$459,713)	(\$986,370)	(\$1,524,390)	(\$2,190,225)	(\$2,480,400)	(\$2,790,450)	(\$1,524,390)	(\$2,190,225)	(\$2,480,400)	(\$2,790,450)
Primary Use Replacement Reserve	(\$13,000)	(\$28,000)	(\$42,000)	(\$58,000)	(\$64,000)	(\$72,000)	(\$42,000)	(\$58,000)	(\$64,000)	(\$72,000)
Secondary Use Annual Operating Expenses			(\$65,000)	(\$65,000)	(\$130,000)	(\$130,000)	(\$65,000)	(\$65,000)	(\$130,000)	(\$130,000)
Secondary Use Replacement Reserve			(\$5,000)	(\$5,000)	(\$10,000)	(\$10,000)	(\$5,000)	(\$5,000)	(\$10,000)	(\$10,000)
Total expenses and replacement reserve	(\$472,713)	(\$1,014,370)	(\$1,636,390)	(\$2,318,225)	(\$2,684,400)	(\$3,002,450)	(\$1,636,390)	(\$2,318,225)	(\$2,684,400)	(\$3,002,450)
Net Operating Income (NOI) or Res Sales Revenue	\$1,116,930	\$2,616,446	\$4,221,017	\$5,786,952	\$6,802,232	\$7,772,845	\$4,411,048	\$6,049,776	\$7,102,396	\$8,114,607
VALUATION CALCULATIONS										
Return on Cost	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.6%	5.6%
Cash on Cash Return	4.6%	4.7%	4.6%	4.7%	4.7%	4.7%	4.7%	4.8%	4.9%	4.9%
Internal Rate of Return (IRR)	10.4%	10.6%	10.5%	10.6%	10.8%	10.6%	10.6%	10.9%	11.2%	11.3%
ROE (year 5)	5.6%	5.7%	5.7%	5.8%	5.8%	5.8%	5.7%	5.9%	6.1%	6.2%

Note: See Section I for explanation of assumptions.
Source: Root Policy Research.

Figure C-2.
Rental Residential Proformas, Typical and High Cost Submarkets, Affordability at 80% AMI

SITE & PROTOTYPE ASSUMPTIONS	Typical Submarket: 12% affordable @ 80% AMI						High Cost Submarket: 15% affordable @ 80% AMI			
	3-Story Rental	5-Story Rental	8-Story Rental	12-Story Rental	16-Story Rental	20-Story Rental	8-Story Rental	12-Story Rental	16-Story Rental	20-Story Rental
	Residential	Residential	Residential	Residential	Residential	Residential	Residential	Residential	Residential	Residential
Parcel Description										
Parcel Size (Acres)	1.20	1.00	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Building Stories	3	5	8	12	16	20	8	12	16	20
Total Building Gross Sq.Ft. (excl. parking)	66,600	137,400	211,363	270,263	302,926	335,726	211,363	270,363	303,026	335,726
Total Parking Sq.Ft. (excl. surface parking)	0	34,808	51,188	70,688	78,000	87,750	51,188	70,688	78,000	87,750
Total Residential units	65	140	210	290	320	360	210	290	320	360
Primary Use										
Total Net Leasable Area	53,940	105,213	157,819	202,884	223,872	251,856	152,439	195,968	216,240	243,270
Efficiency Rate (GLA/Gross Sq.Ft.)	92%	87%	87%	87%	87%	88%	87%	87%	87%	88%
Use #1 Gross Building Sq.Ft.	58,600	120,900	181,400	233,200	257,300	286,200	175,200	225,300	248,600	276,400
Optional Use: Affordable Housing										
Number of Affordable Units	8	17	25	35	38	43	32	44	48	54
Total Net Leasable Area	7,355	14,347	21,521	27,666	30,528	34,344	26,901	34,583	38,160	42,930
Efficiency Rate (GLA/Gross Sq.Ft.)	92%	87%	87%	87%	87%	88%	87%	87%	87%	88%
Use #2 Gross Building Sq.Ft.	8,000	16,500	24,700	31,800	35,100	39,000	30,900	39,800	43,900	48,800
Secondary Use: Retail										
Total Net Leasable Area			5,000	5,000	10,000	10,000	5,000	5,000	10,000	10,000
Efficiency Rate (GLA/Gross Sq.Ft.)			95%	95%	95%	95%	95%	95%	95%	95%
Use #2 Gross Building Sq.Ft.			5,263	5,263	10,526	10,526	5,263	5,263	10,526	10,526
Parking										
Garage (single family and townhomes)	0	0	0	0	0	0	0	0	0	0
Surface spaces	65	19	0	0	0	0	0	0	0	0
Tuck under spaces	0	0	0	0	0	0	0	0	0	0
Structured spaces	0	107	118	163	144	135	118	163	144	135
Underground spaces	0	0	39	54	96	135	39	54	96	135
CAPITAL COSTS										
LAND COST										
Total Land Cost	\$2,613,600	\$4,356,000	\$3,267,000	\$5,717,250	\$5,717,250	\$5,717,250	\$6,534,000	\$9,801,000	\$9,801,000	\$9,801,000
HARD COSTS (HC)										
Total Primary Use Building Cost (excl. aff. units)	\$11,550,110	\$25,033,390	\$41,722,317	\$56,201,200	\$65,360,331	\$75,270,600	\$40,299,966	\$54,285,250	\$63,132,138	\$72,704,557
Total Secondary Use Building Cost			\$1,032,895	\$1,032,895	\$2,065,789	\$2,065,789	\$1,032,895	\$1,032,895	\$2,065,789	\$2,065,789
Affordable Housing Building Costs	\$1,575,015	\$3,413,644	\$5,689,407	\$7,663,800	\$8,912,772	\$10,264,173	\$7,111,759	\$9,579,750	\$11,140,966	\$12,830,216
Sites, Site Prep, Landscaping	\$656,256	\$1,422,352	\$2,403,481	\$3,226,145	\$3,779,445	\$4,342,528	\$2,403,481	\$3,226,145	\$3,779,445	\$4,342,528
Parking Construction Costs	\$260,000	\$3,824,100	\$5,906,250	\$8,156,250	\$9,360,000	\$10,800,000	\$5,906,250	\$8,156,250	\$9,360,000	\$10,800,000
Total Hard Costs	\$14,041,381	\$33,693,486	\$56,754,350	\$76,280,289	\$89,478,338	\$102,743,090	\$56,754,350	\$76,280,289	\$89,478,338	\$102,743,090
SOFT COSTS										
Soft Costs (excluding linkage)	\$2,457,242	\$6,233,295	\$11,067,098	\$14,874,656	\$17,448,276	\$20,034,903	\$11,067,098	\$14,874,656	\$17,448,276	\$20,034,903
Primary Use Linkage Fee	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Secondary Use Linkage Fee			\$8,474	\$8,474	\$16,947	\$16,947	\$8,474	\$8,474	\$16,947	\$16,947
Total Soft Costs	\$2,457,242	\$6,233,295	\$11,075,572	\$14,883,130	\$17,465,223	\$20,051,850	\$11,075,572	\$14,883,130	\$17,465,223	\$20,051,850
CONSTRUCTION FINANCING COSTS										
Total Construction Financing Costs	\$679,193	\$1,816,669	\$3,380,191	\$4,938,019	\$6,719,620	\$8,247,727	\$3,380,191	\$4,938,019	\$6,719,620	\$8,247,727
CONTINGENCY										
Contingency	\$659,945	\$1,597,071	\$2,713,197	\$3,646,537	\$4,277,742	\$4,911,798	\$2,713,197	\$3,646,537	\$4,277,742	\$4,911,798
TOTAL DEVELOPMENT COST	\$20,451,361	\$47,696,521	\$77,190,310	\$105,465,225	\$123,658,174	\$141,671,715	\$80,457,310	\$109,548,975	\$127,741,924	\$145,755,465
REVENUES & OPERATING EXPENSES										
Primary Use										
Annual Lease/Sales Revenue	\$1,514,624	\$3,244,763	\$5,037,589	\$7,036,017	\$8,139,986	\$9,308,598	\$5,109,146	\$7,135,961	\$8,255,611	\$9,440,822
Misc. Revenue	\$13,728	\$73,920	\$166,320	\$244,992	\$270,336	\$304,128	\$160,650	\$236,640	\$261,120	\$293,760
Less: Vacancy Allowance	(\$76,418)	(\$165,934)	(\$260,195)	(\$364,050)	(\$420,516)	(\$480,636)	(\$263,490)	(\$368,630)	(\$425,837)	(\$486,729)
Effective Gross Income (excl parking)	\$1,451,934	\$3,152,749	\$4,943,713	\$6,916,959	\$7,989,806	\$9,132,089	\$5,006,306	\$7,003,971	\$8,090,894	\$9,247,853
Secondary Use										
Lease/Sales Revenue			\$210,000	\$210,000	\$420,000	\$420,000	\$210,000	\$210,000	\$420,000	\$420,000
Less: Vacancy Allowance			(\$21,000)	(\$21,000)	(\$42,000)	(\$42,000)	(\$21,000)	(\$21,000)	(\$42,000)	(\$42,000)
Effective Gross Income			\$189,000	\$189,000	\$378,000	\$378,000	\$189,000	\$189,000	\$378,000	\$378,000
Affordable Housing										
Annual Lease/Sales Revenue	\$151,175	\$313,940	\$470,911	\$636,167	\$701,978	\$789,725	\$588,638	\$795,209	\$877,472	\$987,156
Misc. Revenue	\$1,248	\$6,720	\$15,120	\$22,272	\$24,576	\$27,648	\$18,900	\$27,840	\$30,720	\$34,560
Less: Vacancy Allowance	(\$6,097)	(\$12,826)	(\$19,441)	(\$26,338)	(\$29,062)	(\$32,695)	(\$24,302)	(\$32,922)	(\$36,328)	(\$40,869)
Effective Gross Income (excl parking)	\$146,326	\$307,834	\$466,589	\$632,102	\$697,492	\$784,678	\$583,237	\$790,127	\$871,865	\$980,848
Parking Revenue										
Parking Revenue	\$0	\$192,780	\$283,500	\$391,500	\$432,000	\$486,000	\$283,500	\$391,500	\$432,000	\$486,000
Less: Vacancy Allowance	\$0	(\$9,639)	(\$14,175)	(\$19,575)	(\$21,600)	(\$24,300)	(\$14,175)	(\$19,575)	(\$21,600)	(\$24,300)
Effective Gross Income	\$0	\$183,141	\$269,325	\$371,925	\$410,400	\$461,700	\$269,325	\$371,925	\$410,400	\$461,700
Less Operating Expenses & Replacement Reserve										
Primary Use Annual Operating Exp (incl aff units)	(\$459,713)	(\$986,370)	(\$1,524,390)	(\$2,190,225)	(\$2,480,400)	(\$2,790,450)	(\$1,524,390)	(\$2,190,225)	(\$2,480,400)	(\$2,790,450)
Primary Use Replacement Reserve	(\$13,000)	(\$28,000)	(\$42,000)	(\$58,000)	(\$64,000)	(\$72,000)	(\$42,000)	(\$58,000)	(\$64,000)	(\$72,000)
Secondary Use Annual Operating Expenses			(\$65,000)	(\$65,000)	(\$130,000)	(\$130,000)	(\$65,000)	(\$65,000)	(\$130,000)	(\$130,000)
Secondary Use Replacement Reserve			(\$5,000)	(\$5,000)	(\$10,000)	(\$10,000)	(\$5,000)	(\$5,000)	(\$10,000)	(\$10,000)
Total expenses and replacement reserve	(\$472,713)	(\$1,014,370)	(\$1,636,390)	(\$2,318,225)	(\$2,684,400)	(\$3,002,450)	(\$1,636,390)	(\$2,318,225)	(\$2,684,400)	(\$3,002,450)
Net Operating Income (NOI) or Res Sales Revenue	\$1,125,548	\$2,629,354	\$4,232,238	\$5,791,761	\$6,791,298	\$7,754,018	\$4,411,478	\$6,036,798	\$7,066,759	\$8,065,951
VALUATION CALCULATIONS										
Return on Cost	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Cash on Cash Return	4.7%	4.8%	4.7%	4.7%	4.7%	4.6%	4.7%	4.8%	4.8%	4.8%
Internal Rate of Return (IRR)	10.8%	10.8%	10.6%	10.7%	10.7%	10.5%	10.6%	10.8%	11.0%	11.0%
ROE (year 5)	5.8%	5.9%	5.7%	5.8%	5.8%	5.7%	5.7%	5.9%	6.0%	6.0%

Note: See Section I for explanation of assumptions.
Source: Root Policy Research.

Figure C-3.
For-Sale Residential Proformas, Typical Submarket, Affordability at 80% AMI and 100% AMI

SITE & PROTOTYPE ASSUMPTIONS	Typical Submarket: 10% affordable @ 80% AMI				Typical Submarket: 12% affordable @ 100% AMI				High Cost: 12% affordable @ 80% AMI	High Cost: 15% affordable @ 100% AMI
	Single Unit	For-Sale Townhomes	5-Story Condo	12-Story Condo	Single Unit	For-Sale Townhomes	5-Story Condo	12-Story Condo	12-Story Condo	12-Story Condo
Parcel Description										
Parcel Size (Acres)	0.12	0.41	1.00	1.00	0.12	0.41	1.00	1.00	1.00	1.00
Building Stories	2	3	5	12	2	3	5	12	12	12
Total Building Gross Sq.Ft. (excl. parking)	2,700	21,700	128,900	302,900	2,700	21,700	128,900	302,900	302,900	302,900
Total Parking Sq.Ft. (excl. surface parking)	0	0	32,805	94,656	0	0	32,805	94,656	94,656	94,656
Total Residential units	1	10	95	233	1	10	95	233	233	233
Primary Use										
Total Net Leasable Area	2,313	17,550	86,783	204,458	2,262	17,160	84,854	199,914	199,914	193,099
Efficiency Rate (GLA/Gross Sq.Ft.)	95%	90%	75%	75%	95%	90%	75%	75%	75%	75%
Use #1 Gross Building Sq.Ft.	2,400	19,500	116,000	272,600	2,400	19,100	113,400	266,600	266,600	257,500
Optional Use: Affordable Housing										
Number of Affordable Units	0.10	1.0	9.5	23	0.12	1.2	11.4	28	28	35
Total Net Leasable Area	257	1,950	9,643	22,718	308	2,340	11,571	27,261	27,261	34,076
Efficiency Rate (GLA/Gross Sq.Ft.)	95%	90%	75%	75%	95%	90%	75%	75%	75%	75%
Use #2 Gross Building Sq.Ft.	300	2,200	12,900	30,300	300	2,600	15,500	36,300	36,300	45,400
Secondary Use: Retail										
Total Net Leasable Area										
Efficiency Rate (GLA/Gross Sq.Ft.)										
Use #2 Gross Building Sq.Ft.										
Parking										
Garage (single family and townhomes)	2	10	0	0	2	10	0	0	0	0
Surface spaces	0	0	18	0	0	0	18	0	0	0
Tuck under spaces	0	0	0	0	0	0	0	0	0	0
Structured spaces	0	0	101	117	0	0	101	117	117	117
Underground spaces	0	0	0	175	0	0	0	175	175	175
CAPITAL COSTS										
LAND COST										
Total Land Cost	\$210,000	\$900,000	\$4,356,000	\$7,623,000	\$210,000	\$900,000	\$4,356,000	\$7,623,000	\$13,068,000	\$13,068,000
HARD COSTS (HC)										
Total Primary Use Building Cost (excl. aff. units)	\$365,211	\$3,334,500	\$28,575,069	\$78,170,918	\$357,095	\$3,260,400	\$27,940,068	\$76,433,786	\$76,433,786	\$73,828,089
Total Secondary Use Building Cost										
Affordable Housing Building Costs	\$40,579	\$370,500	\$3,175,008	\$8,685,657	\$48,695	\$444,600	\$3,810,009	\$10,422,789	\$10,422,789	\$13,028,486
Sites, Site Prep, Landscaping	\$16,232	\$185,250	\$1,587,504	\$4,342,829	\$16,232	\$185,250	\$1,587,504	\$4,342,829	\$4,342,829	\$4,342,829
Parking Construction Costs	\$21,000	\$105,000	\$3,604,063	\$11,941,250	\$21,000	\$105,000	\$3,604,063	\$11,941,250	\$11,941,250	\$11,941,250
Total Hard Costs	\$443,021	\$3,995,250	\$36,941,643	\$103,140,654	\$443,021	\$3,995,250	\$36,941,643	\$103,140,654	\$103,140,654	\$103,140,654
SOFT COSTS										
Soft Costs (excluding linkage)	\$70,883	\$699,169	\$7,203,620	\$20,112,427	\$70,883	\$699,169	\$7,203,620	\$20,112,427	\$20,112,427	\$20,112,427
Primary Use Linkage Fee	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Secondary Use Linkage Fee										
Total Soft Costs	\$70,883	\$699,169	\$7,203,620	\$20,112,427	\$70,883	\$699,169	\$7,203,620	\$20,112,427	\$20,112,427	\$20,112,427
CONSTRUCTION FINANCING COSTS										
Total Construction Financing Costs	\$14,475	\$172,911	\$2,199,906	\$7,210,305	\$14,475	\$172,911	\$2,199,906	\$7,210,305	\$7,210,305	\$7,210,305
CONTINGENCY										
Contingency	\$20,556	\$187,777	\$1,765,811	\$4,930,123	\$20,556	\$187,777	\$1,765,811	\$4,930,123	\$4,930,123	\$4,930,123
TOTAL DEVELOPMENT COST	\$758,936	\$5,955,107	\$52,466,980	\$143,016,510	\$758,936	\$5,955,107	\$52,466,980	\$143,016,510	\$148,461,510	\$148,461,510
REVENUES & OPERATING EXPENSES										
Primary Use										
Annual Lease/Sales Revenue	\$778,500	\$6,147,000	\$53,694,000	\$145,741,500	\$761,200	\$6,010,400	\$52,500,800	\$142,502,800	\$149,627,940	\$144,526,988
Misc. Revenue										
Less: Vacancy Allowance										
Effective Gross Income (excl parking)	\$778,500	\$6,147,000	\$53,694,000	\$145,741,500	\$761,200	\$6,010,400	\$52,500,800	\$142,502,800	\$149,627,940	\$144,526,988
Secondary Use										
Lease/Sales Revenue										
Less: Vacancy Allowance										
Effective Gross Income										
Affordable Housing										
Annual Lease/Sales Revenue	\$38,635	\$348,007	\$2,387,400	\$5,855,414	\$57,952	\$522,011	\$3,581,101	\$8,783,121	\$7,026,497	\$10,978,901
Misc. Revenue										
Less: Vacancy Allowance										
Effective Gross Income (excl parking)	\$38,635	\$348,007	\$2,387,400	\$5,855,414	\$57,952	\$522,011	\$3,581,101	\$8,783,121	\$7,026,497	\$10,978,901
Parking Revenue										
Parking Revenue	\$0	\$0	\$1,009,375	\$5,825,000	\$0	\$0	\$1,009,375	\$5,825,000	\$5,825,000	\$5,825,000
Less: Vacancy Allowance										
Effective Gross Income	\$0	\$0	\$1,009,375	\$5,825,000	\$0	\$0	\$1,009,375	\$5,825,000	\$5,825,000	\$5,825,000
Less Operating Expenses & Replacement Reserve										
Primary Use Annual Operating Exp (incl aff units)										
Primary Use Replacement Reserve										
Secondary Use Annual Operating Expenses										
Secondary Use Replacement Reserve										
Total expenses and replacement reserve	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Net Operating Income (NOI) or Res Sales Revenue	\$817,135	\$6,495,007	\$57,090,775	\$157,421,914	\$819,152	\$6,532,411	\$57,091,276	\$157,110,921	\$162,479,437	\$161,330,888
VALUATION CALCULATIONS										
Return on Cost	6.6%	6.9%	6.6%	7.9%	6.9%	7.5%	6.6%	7.7%	7.3%	6.5%
Cash on Cash Return	22.0%	22.9%	13.3%	13.1%	22.8%	25.0%	13.3%	12.8%	12.1%	10.8%
Internal Rate of Return (IRR)										
ROE (year 5)										

Note: See Section I for explanation of assumptions.
Source: Root Policy Research.