Economic Feasibility Analysis of the Height Master Plan

Prepared for the:

District of Columbia Office of Planning

September 23, 2013

Partners for Economic Solutions
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Executive Summary

The House Committee on Oversight and Government Reform has directed the District of Columbia and the National Capital Planning Commission (NCPC) to evaluate the impact of strategic changes to the federal Height of Buildings Act of 1910 and determine the extent to which the Height Act continues to serve both the federal and District government interests. In response to that direction, NCPC and the DC Office of Planning (OP) are jointly exploring the many factors involved in and influenced by the height limits. Currently underway are research into height limit policies and practices internationally and analysis of the visual impacts of building heights on monument and other iconic views and on surrounding development and neighborhoods. OP commissioned Partners for Economic Solutions (PES) to evaluate the financial and economic implications of changing the height limits, considering construction cost impacts, considering primarily the behavior and the development capacity of property owners and their response to the availability of additional height. Structura, Inc. and James G. Davis Construction Corporation joined PES to explain the forces impacting construction costs at higher heights and to provide construction cost estimates that reflect the higher building heights. PES incorporated those construction cost estimates into financial pro formas that test the feasibility of new construction at a range of heights (130, 160, 200 and 250 feet) in various locations. The analysis assumed that the allowed density would increase commensurately with additional height, and the buildings would fill the zoning envelope. As shown below, these alternatives involve buildings of 10 to 24 stories.

Conversion Factors from Height to Stories

	Stories		FAR	
Height in Feet	Commercial	Residential	Commercial	Residential
130	10	12	9.5	10.2
160	13	15	12.4	12.8
200	17	19	16.2	16.2
250	21	24	20.0	20.4

To test the likely market response and impacts of raising building height limits, OP and PES identified 15 illustrative areas (shown on the following map) that represent a range of development areas that might attract and accommodate taller buildings.

The analytical process included answering the following questions:

1) How much does it cost to build higher-rise buildings?
2) Do the study areas' market rents support higher-rise construction?
3) Is the market demand sufficient to justify the size of a higher-rise building?
4) In what areas and under what circumstances would building owners expand by adding new floors?

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Friendship Heights
Intelstat
Soldier's Home
Rhode Island Ave
Florida Ave Market
M & 22nd Sts NW
Farragut
5th & K Sts NW
NoMa
L'Enfant Plaza
Federal Center SW
Waterfront Station
Buzzard Point
Poplar Point (2 Sites)
Congress Heights

Analysis Areas
Height Study

Office of Planning ~ January 30, 2013

Government of the District of Columbia

This map was created for planning purposes from a variety of sources. It is neither a survey nor a legal document. Information provided by other agencies should be verified with them where appropriate.

Study Areas

Topographic Bowl

5) How much development would an increase in the building height limit generate District-wide?
6) How would increasing the building height limits affect employment and District tax revenues?

Given this analysis's dependence on current and near-term market conditions, its conclusions about the ability of the market to support higher-rise development are valid for the next 5 to 10 years, over which time period we note, the development capacity pressures will be less than in subsequent years and developers will still have choices about where they can grow. The fiscal impact considers the incremental net new tax revenues generated by higher-rise development decisions made based on those initial market conditions (over the next 5-10 years) and carries those impacts through over twenty years through 2040. Revisions to the Height of Buildings Act will guide District development for a much longer time and the long-term vision for the District's growth should consider the next 100 years. Over time, market conditions will change drastically. As the city continues to attract new residents and demand increases for new housing and office space, rents are likely to continue climbing. Over the 100-year future, those economic forces will shift the market realities, making it possible that market support for higher-rise development will emerge in many of the areas that do not now support high density.

Conclusions

Raising the height limits could play a role in helping the District to expand its population and employment base if focused in areas of high market demand – primarily Center City and selected Metro locations where rents are high enough to support higher-rise construction costs. Residential expansion offers particular opportunities. Although not studied, new development in response to higher height limits also could include hotels.

Building Additions

Vertical expansions of existing buildings in response to higher building height limits offer the best potential economic returns, where appropriate. Generally, the potential for additional floors is governed by the available bearing capacity of the existing structure. In most cases, this means that concrete buildings of eight or more stories can accommodate one to two additional stories. However, additions are not suitable for every such building due to the complications of upgrading the building core, relocating rooftop equipment and managing the impacts on existing tenants if the building is not vacant.

The costs of building additions are significantly lower than construction of new replacement buildings, and the additions do not require the loss of a valuable income-producing asset. The market risks also are lower by adding a smaller block of new space at one time. Most often, additions are timed to coincide with renovations to the rest of the building, allowing for faster construction than would be possible when working around the schedules and needs of existing tenants.

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New Development

In new development, the greater design flexibility of higher heights could help the District to better compete by offering space with higher ceilings, outstanding views and more windows. Those design preferences have been hard to meet in the Center City due to the high land value and the pressures to maximize square footage. Relative to other cities, in the District the relationship between the height of buildings and the allowable Floor Area Ratio (FAR) is quite close; a building with an allowed height of 130 feet might have an FAR of 8.0 - 11.0. In San Francisco, a building with an FAR of 16 might be between 450 and 650 feet tall. In other cities, there may only be FAR, bulk or setback requirements but no height limits. Because properties are valued based on the development potential, buildings in DC are designed to fill completely their development envelope, squeezing floor-to-floor heights to achieve the maximum number of floors within the height limit. If the FAR were not tied as closely to building height, there would be less pressure to maximize the number of floors within the maximum height, allowing developers to adopt steel construction with somewhat lower per-square-foot construction costs.

Higher densities could support a wider range of business district retail and service amenities. Approximately 500,000 people commute into the District each workday for employment; with more city housing options available, more people employed in the District could live in the District and commute by foot, bicycle or transit. That could moderate growth in the commuting pressure on the District's road network. Reverse commuting to jobs in the suburbs could make better use of Metro capacity as well.

However, these benefits do not come without some risks:

- If offered all at once, a substantial increase in the amount of development potential allowed by zoning and height limits could undercut the value of land and existing buildings.
- Similarly, lower investor confidence in the long-term value of Washington real estate due to the greater potential of an over-supply and higher market volatility could result in a shifting of some investment funds away from the District.
- Such a shift could reduce the value of existing buildings and the property taxes generated for the District.
- Paradoxically, an increase in allowable height (if accompanied by a commensurate increase in development potential) also would likely exacerbate land acquisition and assembly problems by raising property owners' expectations and price demands, at least in the short run.

Avoiding those risks would require a careful balancing of the increase in development potential. Allowable FAR can be de-coupled from the height limits. An increase in building heights need not be accompanied by a commensurate increase in FAR zoning limits. The FAR increase could be much smaller with the higher height limits allowing greater design

flexibility and variety in building form as well as a wider range of rents, even in a single project.

The newly created FAR available for development under the increased building heights could be gradually introduced to the market, perhaps auctioned off periodically with area developers competing for the opportunity to construct a higher-rise building. That would prevent a sudden over-supply of development rights while capturing the value created by the additional development potential and channeling it to specific policy goals, possibly including upgrades to the city's infrastructure and/or funding for affordable housing.

Constraining Factors

In most cases, existing well-leased buildings would not be redeveloped unless the additional density were sufficient to warrant the investment, meaning heights of more than 160 feet. Vertical expansions would be more likely with the buildings able to support one to three additional floors.

Parking could prove to be a major constraint on new development given the prohibitive costs of building more than three levels of underground parking. While parking ratios are declining, particularly in the residential sector, parking is still a significant factor in office location decisions.

The District's aging infrastructure must continue to be addressed whether the height limits are raised or not, including power, stormwater, transportation and the road network. System upgrades by individual development projects are not sufficient to address the overall problems, and infrastructure inadequacies could constrain future development.

Development Decisions

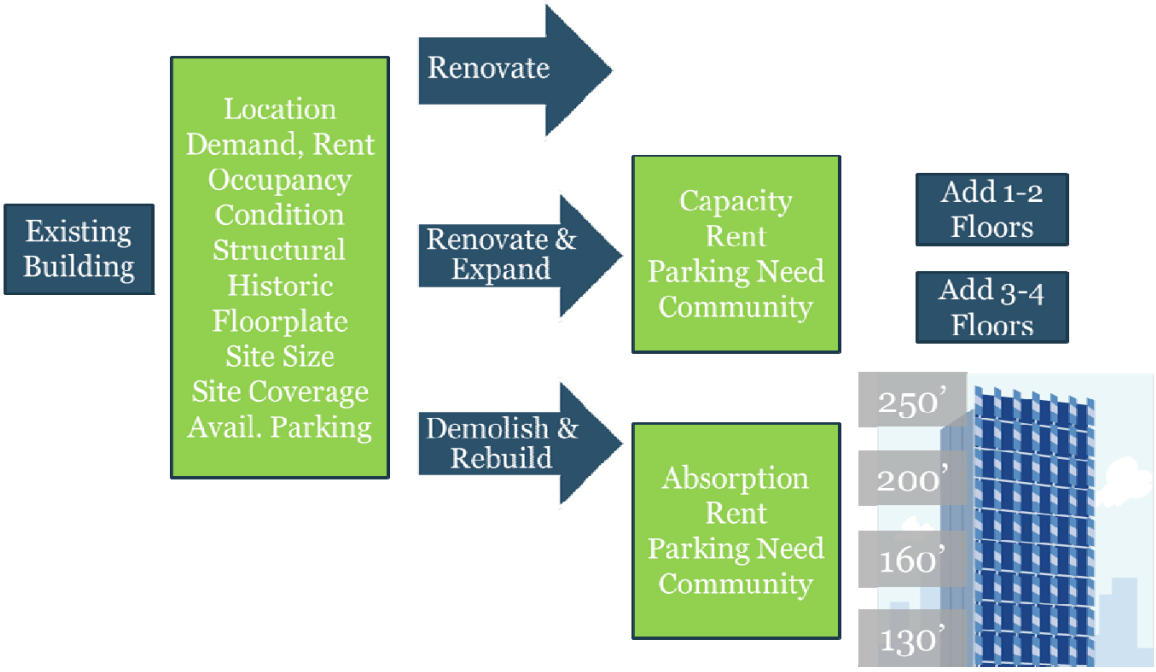
Decisions on actual development and/or redevelopment of specific buildings reflect both physical and financial considerations.

Financially, redevelopment of an existing building depends upon a potential up-side return that outweighs the significant costs and risks. Much of Washington's new construction has replaced low-scale buildings and parking lots where the new development is much larger and has much higher rents. The decision to redevelop a viable office building is distinctly more difficult. A well-leased existing Downtown office building, for example, carries such a high value that redevelopment would be justified only under a narrow set of conditions:

- a substantial potential increase of space;
- higher potential rents due to better/more modern design, amenities and systems;
- expiration of major tenant leases;
- an aging structure needing major reinvestment to remain competitive; and/or

- a major anchor tenant seeking a block of space not available in other buildings.

Development Decision Tree



Other important factors influencing the redevelopment decision include:

- the need to pre-lease 40 to 60 percent of the space to qualify for financing – Washington has a limited number of major tenants occupying at least 100,000 square feet of space;
- sufficient parking to meet tenant demand within the three levels of underground parking that can be developed in the area – a requirement that is not possible for office buildings at 200 or 250 feet or apartment buildings at 250 feet;
- site size;
- views and potential obstructions;
- Washington's aging infrastructure, including power, water, sewer and stormwater systems; and
- road and transit capacity, though some of that constraint can be relieved by reducing commuting from the suburbs in favor of workers living in the District.

New Construction Financial Analysis

The financial analysis entailed preparing *pro formas* for development of new higher-rise construction and expansion through construction of additional floors for office and multi-

family residential development in each of the 15 study areas. A pro forma compares the costs of development to the private investment justified by the future rental revenues. The construction costs for the above-ground buildings are $20 per square foot or 14.3 percent higher for a 200-foot building as for a 130-foot building. Above-ground costs level out above 200 feet with costs per square foot at 250 feet about the same as at 200 feet. The higher above-ground costs are moderated by the fact that the underground costs do not vary significantly and decline as a cost per square foot of above-ground space built at higher heights. Total costs (excluding tenant improvements) vary as much as 4.6 percent per square foot from 130-foot structures to 200-foot structures.

Construction Costs at Varying Heights

	Construction Costs per Square Foot			
	Building Height			
	130 Feet	160 Feet	200 Feet	250 Feet
Office Building				
Sitework	$10.00	$8.00	$6.30	$5.00
Three-Level Below-Grade Garage	$32.00	$30.00	$24.00	$20.00
Office Building	$140.00	$150.00	$160.00	$160.00
Total Cost	$182.00	$188.00	$190.30	$185.00
Residential Apartment Building				
Sitework	$12.00	$9.60	$7.60	$6.00
Three-Level Below-Grade Garage	$32.00	$30.00	$24.00	$20.00
Apartment Building	$155.00	$165.00	$175.00	$175.00
Total Cost	$199.00	$204.60	$206.60	$201.00

Note: Costs expressed in 2013 dollars per gross square foot. Tenant improvement costs are excluded.

Source: Structura, Inc.; James G. Davis Construction Corporation, 2013.

A project's financial feasibility then depends on 1) whether market rents at that location are high enough to support the higher costs of construction and 2) whether the market demand is sufficient to justify developing a building with as much space as that inherent in a higher-rise structure (typically 200,000 to 400,000 square feet). Among the 15 study areas, nine had rents that would support higher-rise offices within the next 5 to 10 years, but only six areas (shown below) had sufficient demand to lease up a higher-rise building within a reasonable time frame. Over the long-term future, increasing citywide demand will likely support higher-rise offices in more locations.

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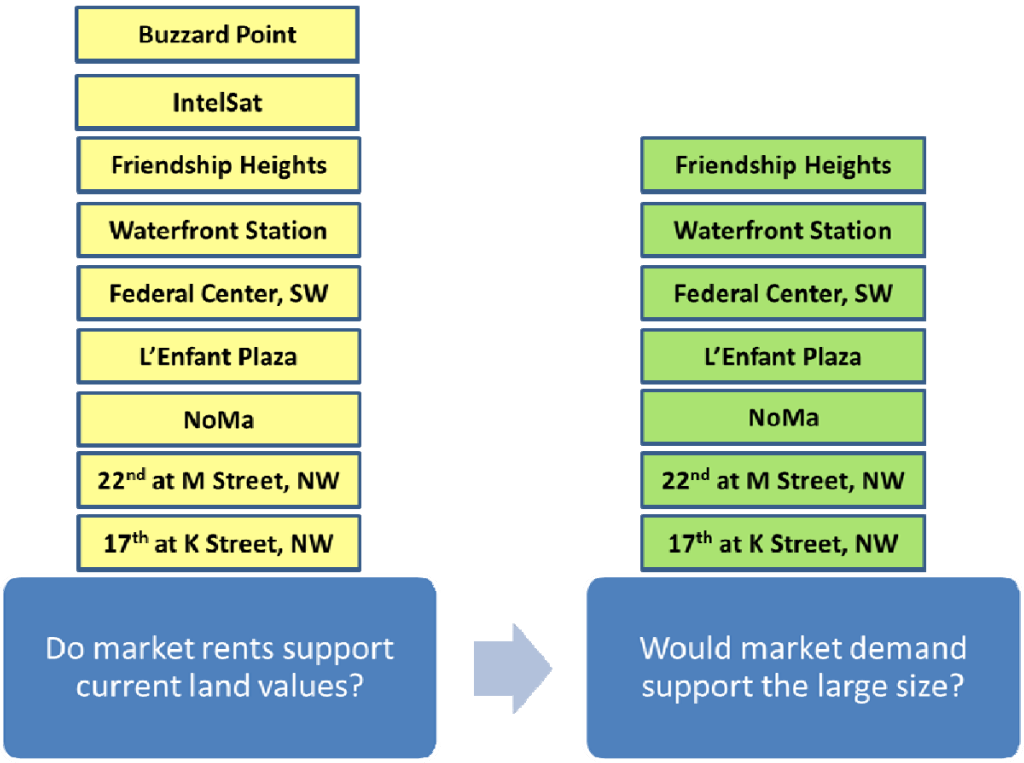
Locations Supportive of High-Rise Office Development



It is important to note that buildings at 200 and 250 feet that occupy the entire zoning envelope would be severely constrained in their marketability by the inadequacy of three levels of underground parking. The restricted parking supply in a 160-foot building could constrain marketability as well, but other options, such as valet parking or automated parking systems, might accommodate sufficient parking.

For apartment development, seven study areas (shown below) had market rents that would support development at 130 feet over the next 5 to 10 years. Only five of those areas could support development at 160, 200 or 250 feet. Each has or is expected to have sufficient market to support the typical higher-rise building of 200 to 250 units. However, the highest building at 250 feet, probably more than 500 units, would push the limits of the market in most of the study areas; again, that assumes that the building would occupy the entire zoning envelope up to 250 feet. That market-support issue could be addressed by allowing increased height with a smaller increase in buildable square feet.

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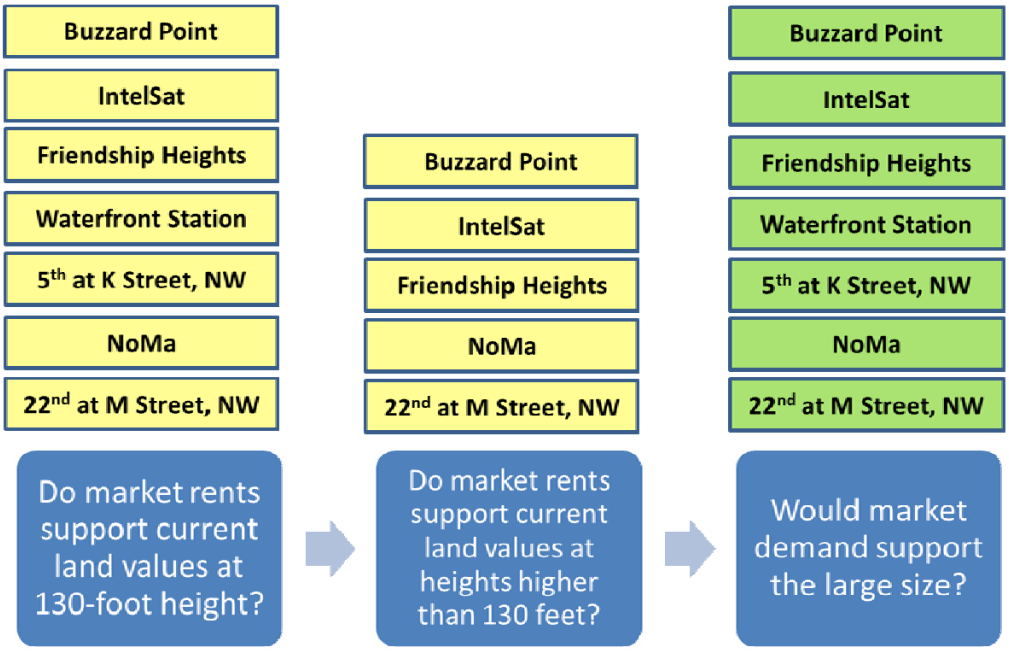
Locations Supportive of High-Rise Apartment Development



Building Additions

When considering the potential for additions to existing buildings in response to higher building height limits, the economics are somewhat more favorable. Generally, the potential for additional floors is governed by the available bearing capacity of the existing structure. In most cases, this means that concrete buildings of eight or more stories can accommodate one to two additional stories. However, additions are not suitable for every such building due to the complications of upgrading the building core, relocating rooftop equipment and managing the impacts on existing tenants if the building is not vacant.

The costs of building additions are significantly lower than construction of new replacement buildings, and the additions do not require the loss of a valuable income-producing asset. The market risks also are lower by adding a smaller block of new space at one time. Most often, additions are timed to coincide with renovations to the rest of the building, allowing for faster construction than would be possible when working around the schedules and needs of existing tenants. Synching the two actions allows for changes to the building core to serve the upper floors and movement of any rooftop building equipment. It ensures that both the existing and new space offer Class A spaces able to compete in the market.

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Construction Costs for Building Expansions of Different Sizes		
	Construction Costs per Square Foot	
	Number of Additional Levels	
	Two	Four
Office Building		
Sitework	$6.00	$4.00
Three-Level Below-Grade Garage[1]	$9.00	$15.00
Office Building[2]	$135.00	$140.00
Total Cost	$150.00	$159.00
Residential Apartment Building		
Sitework	$6.00	$4.00
Three-Level Below-Grade Garage	$9.00	$15.00
Apartment Building[2]	$150.00	$155.00
Total Cost	$165.00	$174.00

Note: Costs expressed in 2013 dollars per gross square foot.

[1]Garage costs are improvements to underground columns and supports.

[2]Building cost includes replacement of the façade on the existing building, core stiffening/strengthening and accommodations for tenant occupancy during construction.

Source: Structura, Inc.; James G. Davis Construction Corporation, 2013.

Office Expansion

Seven study areas provide adequate returns on investment (in excess of 6.5 to 7.0 percent) to justify the addition of two floors of office space:

- 17th Street/Connecticut Avenue at L Street, NW
- 22nd at M Street, NW
- NoMa
- L'Enfant Plaza
- Federal Center SW
- Friendship Heights
- IntelSat

The higher costs associated with adding four levels rule out feasibility for larger building additions in the IntelSat area.

Residential Expansion

The analysis for expansion of apartment buildings indicates that seven study areas that have residential buildings suitable for additional levels would provide returns on investment that would justify addition of two or four levels:

- 22nd at M Street, NW
- NoMa
- 5th at K Street, NW
- L'Enfant Plaza
- Federal Center SW
- Waterfront Station
- IntelSat

The other eight study areas do not have existing buildings suitable for vertical expansion.

District-Wide Higher-Rise Development Projections

In assessing the economic impacts of new higher-rise development, the critical question is whether new higher-rise development would exceed the levels of development that would occur without an increase in building heights. Without a net increment of additional development, new higher-rise development would have minimal benefits to the District's economy.

Office Development Projections

Market demand drives the potential opportunities for the District to benefit from increased building heights. On a conceptual level, the heights of buildings have limited impact on the regional demand for office space and the District's share of that regional demand. Office demand is driven by growth in the number of employees in industries typically housed in office space. The development of new office buildings in the region does not in itself increase the number of office workers.

Development **can** influence the distribution of jobs within the region and the District's capture of those jobs if:

- it provides space in preferred locations that are otherwise built out (e.g., prestige locations proximate to the Capitol or other anchors, along Connecticut or Pennsylvania avenues or with desirable views of the Capitol, the Mall or the rivers);
- the expansion of the office inventory results in lower rents;
- the design of new structures made possible by higher height limits provides a better, more competitive office product;
- higher residential density allows the District to attract a higher share of the region's young knowledge workers; and
- the higher density of office employees supports greater retail amenities, which increase the area's appeal.

However, increased development could trigger traffic constraints that reduce the District's appeal to businesses whose owners commute from the suburbs. The District's ability to

compete also will be influenced by competitive factors of improved Metro accessibility to Tysons as well as place-making activities in surrounding jurisdictions.

On balance, the enhancements allowed by raising the building heights could potentially increase the District's share of the region's new office development by 1 to 2 percentage points. The District has been improving its share of the region's office development from 12.0 percent from 1994 through 2002 to 29.4 percent from 2003 through 2012. However, the share changes from year to year, ranging from 0 to almost 60 percent. Metropolitan office development averaged 4,244,000 square feet per year from 2003 through 2012. A one- to two-percentage-point increase would translate into incremental development of 45,000 to 89,000 square feet annually over the next 20 years, roughly one new higher-rise building every three to four years. This represents a 2.5- to 4.9-percent increase in the District's average office development from the same 2003-2012 period.

Incremental Higher-Rise Development Projections				
	Maximum Building Height			
Study Area	130 Feet	160 Feet	200 Feet	250 Feet
Office Development				
Total 20-Year Increment (square feet)	900,000	1,340,000	1,600,000	1,780,000
Percent of Regional Development	1.0%	1.5%	1.8%	2.0%
Apartment Development				
Total 20-Year Increment (units)	8,800	11,000	12,300	13,200
Percent of 2020-2040 Growth	20.0%	25.0%	28.0%	30.0%
Source: Partners for Economic Solutions, 2013.				

Residential Development Projections

Residential markets are more easily influenced as renters move more frequently than do office tenants. As with office space, raising building heights would help by:

- allowing additional development in locations that are otherwise built-out near Metro stations and other amenities;
- offering a product not otherwise available – units with outstanding views, high ceilings and more windows;
- supporting expansion of neighborhood retail and amenities with higher population densities; and/or
- possibly lowering rents marginally through supply expansion, though higher construction costs limit the potential for significant blocks of new affordable housing.

Since 2005, the District's population has reversed long-time trends of decline to begin rising again. Over the last four years, the District's population has risen dramatically, adding an average of 1,085 new residents per month according to the U.S. Census Bureau. With the influx of new residents, previously under-served neighborhoods are attracting coffee shops, restaurants, service providers and retailers, providing residents with a more complete community and the benefits of walkable retail. That enhanced quality of life then attracts more residents to the District, who take advantage of superior access to transit and jobs in a walkable urban environment. In addition to the city's obvious advantages for persons working in the District, the appeal of its neighborhoods also has attracted residents who work in the suburbs and reverse commute. More than 27 percent of District residents commuted to jobs outside of the city in 2011.

The Metropolitan Washington Council of Governments now projects that the District's population will grow from 601,700 in 2010 to 677,000 by 2020, 723,000 by 2030 and 771,000 by 2040. To meet this demand, the District will need a net addition of 44,000 new housing units between 2020 and 2040.

The current supply of available sites is unlikely to be able to accommodate this scale of development without significant increases in density. The city's supply of vacant or significantly underutilized sites in high-demand areas near to downtown or to Metro stations is limited. As discussed earlier, redevelopment of existing six- to nine-story apartment buildings is unlikely except in cases of structures in need of major investment, the opportunity for a substantial increase in the size of the building and/or significantly higher potential rents due to better/more modern design, amenities and systems. With competitive pressure from new transit-oriented development in surrounding jurisdictions, the District's ability to achieve its full housing potential will depend on achieving higher densities in Metro-accessible locations.

By increasing the availability of residential units in Metro-served locations and enhancing neighborhoods, higher-rise apartment construction should be likely to accommodate 25 to 30 percent of this new housing development, or 11,000 to 13,200 units over 20 years. Not all of that new development or expansion of existing buildings will create net new units that would not have been developed in the District on other sites or in smaller buildings. While vertical expansion of existing buildings would create net new units, redevelopment would involve demolition of existing units and/or would include units that could have been built under a 90-foot height limit. These replacement units are excluded from the estimate of net new units. The percent of the units in higher-rise buildings estimated to be net new units ranges from 40 percent at the 130-foot height limit (which would accommodate most feasible expansions of existing buildings) to 60 percent at the 250-foot height limit. For the 20-year period from 2020 to 2040, higher building height limits could generate 4,400 to 7,900 net new housing units for the District beyond what could be achieved under current building height limitations. During this period, capacity still otherwise exists in many of the submarkets to expand without additional height above 130 feet.

Impact on Residential Rents

While newly constructed higher-rise apartments are likely to have relatively high rents, expansion of the housing supply should result in lower rents if new supply exceeds the growth in demand. The availability of new apartments will put competitive pressure on existing buildings to renovate and maintain their edge and/or lower their rents. Units that are not as well located and maintained will see a lessening of demand and lower rents.

However, the impacts on prevailing rents are likely to occur primarily at the margin. The District's high costs of development and natural market forces will limit the extent of oversupply and rent reductions over the longer term, though during the down parts of market cycles, the additional supply could lead to lower rents until supply and demand are back in balance.

Economic and Fiscal Impacts

The potential economic impacts of raising the maximum building heights have nine major components:

1) scale and mix of new development, discussed above;
2) increased market volatility as larger blocks of space enter the market at one time;
3) change in existing building and land values;
4) geographic distribution of development with the availability of significant new Downtown development potential possibly slowing development in other parts of the Center City;
5) property and other taxes paid on new development;
6) income, sales and other taxes paid by new residents;
7) job creation;
8) contribution to quality of life and urban amenities that spur higher rents/values and private investment; and
9) a moderate impact on overall affordability, noting that higher-rise construction is costly and would be justified only by rents at the higher range.

Property Value Impacts

Increases in height limits and developable square feet would increase property values and property tax revenues to the District if the new development rights are created and released gradually. Doubling the building heights does not require doubling the associated FAR zoning limitations. Height limits could be raised but with a more modest increase in FARs.

If FARs were increased commensurately with building heights, a major increase in the scale of development opportunities could undermine some of the market discipline provided by the limited supply of land coupled with the height limits. If that lifting of constraints affected investors' confidence in the long-term growth in District property values, they

could lower their bid prices in acquiring buildings in the market. That would impact sales prices and property value assessments based on those transactions.

Theoretically, the lifting of the height limit to 250 feet could double the square feet of allowable development in the downtown core. In the balance of supply and demand, the availability of such expansive development potential could be expected to reduce land values per FAR[1] square foot. What is unclear is whether the overall value of all Center City land would be reduced below the current value. Certainly, the larger the increase in development potential, the greater the risk of adverse impacts on land and building values. For a sense of scale, a 10-percent reduction in downtown[2] commercial building values would cost the District $5 million in annual real property tax revenues.

The major threat to the value of existing buildings is the increased chance of a significant over-building that would undermine the ability of existing buildings to continue to command high rents.

New Tax Revenues

Twenty years of new higher-rise development could generate a total of $62 to $115 million in annual tax revenues depending on the new building height limits. This represents incremental new revenues every year resulting from construction of the new office space and apartments over a 20-year period. The largest increase in revenues would be generated by the growth in income and sales taxes paid by new District residents attracted by the expanded housing supply. Note that this revenue projection applies only to the period before current capacity for growth is exhausted.

[1] Floor Area Ratio is the ratio between a building's above-ground square feet and the site's square footage.

[2] The area bounded by 2nd Street, NE, I-395, Rock Creek Park and M Street, NW.

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Annual District Government Revenues Generated by High-Rise Construction After 20 Years				
	Building Height			
	130 Feet	160 Feet	200 Feet	250 Feet
Annual On-Going Revenues				
Real Property Tax[1]	$ 16,237,200	$ 21,748,700	$ 28,702,600	$ 31,288,300
Sales Tax Paid by Project Retailers	579,600	869,400	1,035,000	1,138,500
Sales Tax Paid by Project Residents	2,075,500	2,500,100	3,302,000	3,726,500
Sales Tax Paid by Project Employees	764,000	1,136,000	1,358,000	1,510,000
Income Tax Paid by Project Residents	33,408,800	40,242,400	53,150,400	59,984,000
Income Tax Paid by Project Employees	8,583,800	12,779,500	15,260,200	16,976,900
Total Annual On-Going Revenues	**$ 61,648,900**	**$ 79,276,100**	**$ 102,808,200**	**$ 114,624,200**

Note: Revenues in constant 2013 dollars based on Fiscal Year 2013 tax rates.

[1]Real property tax revenue estimate does not account for any reduction in the value of existing buildings resulting from an increase in development potential significantly in excess of new demand.

Source: Partners for Economic Solutions, 2013.

Incremental tax revenues accrued over a 20-year period of development would total $1.6 billion to $3.0 billion (measured in constant 2013 dollars). Net present value expresses the current value of a future stream of revenues, accounting for the time value of money – the fact that a dollar in hand today is more valuable than a dollar received one year from now. To calculate the net present value of these future incomes, PES assumed an equal level of construction for each of the 20 years, a conservative 2.0-percent annual inflation rate, a discount rate of 4.5 percent based on current rates for 20-year municipal bonds, and a 6.5-percent reversion value to reflect the fact that the taxes continue after the 20-year period. After 20 years, the development at varying building heights would generate the annual revenues shown in the table above; in the first year, incremental taxes would be one-twentieth of those estimated revenues. The net present value of 20 years of new tax revenues ranges from $1.0 billion for the 130-foot height limit up to $1.9 billion for the 250-foot height limit.

This analysis tests the potential fiscal impact of 20 years of development at higher building heights. In fact, the fiscal impacts would be much higher as more higher-rise buildings are constructed into the future.

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Total and Net Present Value of New Tax Revenues Generated by 20 Years of Development Under New Height Limits		
Building Height	Total New Revenues[1]	Net Present Value of New Revenues[2]
	(In millions of dollars)	
130 Feet	$1,595.8	$1,027.4
160 Feet	$2,052.0	$1,321.1
200 Feet	$2,661.2	$1,713.3
250 Feet	$2,967.0	$1,910.2
Note: [1]Total revenues shown in constant 2013 dollars.		
[2]Net present value based on a 2.0-percent annual inflation, a 4.5-percent discount rate and a 6.5-percent reversion value.		
Source: Partners for Economic Solutions, 2013.		

Job Creation

Development of 0.9 to 1.8 million new square feet of office space in excess of what would be developed under existing building height limits suggests a potential for 6,900 to 13,650 new on-going jobs over the 20-year period. Rounding out that total to include retail and residential operations would bring the total new job count to 7,100 jobs at 130 feet up to 14,000 jobs at 250 feet. With the growth in the District's base of knowledge workers, 35 percent or 2,500 to 4,900 of these new jobs could be filled by District residents.

Total Direct and Spin-Off Jobs Associated with 20 Years of Higher-Rise Development at Varying Heights				
	Building Height			
Project Component	130 Feet	160 Feet	200 Feet	250 Feet
Operations				
Office	6,902	10,275	12,269	13,650
Retail	78	117	139	153
Residential	108	130	171	193
Total Jobs in Operations	7,088	10,522	12,579	13,996
Construction Period				
Average Annual Full-Time Equivalent Jobs	922	1,187	1,554	1,701
Sources: U.S. Bureau of Economic Analysis; Partners for Economic Solutions, 2013.				

Construction would support an average of 920 temporary jobs annually at 130 feet, up to 1,700 jobs at 250 feet. While many of the jobs will be held by workers from other jurisdictions, roughly 20 percent or 180 to 340 construction-related jobs could be filled by

District residents. The construction industry is an important source of jobs for lower-skilled residents who may have only a high school education.

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Contents

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I. Introduction and Approach

The House Committee on Oversight and Government Reform has directed the District of Columbia and the National Capital Planning Commission (NCPC) to evaluate the federal Height of Buildings Act of 1910 and determine the extent to which the Height Act continues to serve both the federal and District government interests. In response to that direction, NCPC and the DC Office of Planning (OP) are jointly exploring the many factors involved in and influenced by the height limits. Currently underway are research into height limit policies and practices internationally and analysis of the visual impacts of building heights on monument and other iconic views and on surrounding development and neighborhoods. OP commissioned Partners for Economic Solutions (PES) to evaluate the financial and economic implications of changing the height limits, considering construction cost impacts. Structura, Inc. and James G. Davis Construction Corporation joined PES to explain the forces impacting construction costs at higher heights and to provide construction cost estimates that reflect the higher building heights. PES has incorporated those construction cost estimates into financial pro formas that test the feasibility of new construction at a range of heights (130, 160, 200 and 250 feet) in various locations.

To test the likely market response and impacts of raising building height limits, OP and PES identified 15 illustrative areas that represent a range of development areas that might attract and accommodate taller buildings:

- Sites designated as high density on the Comprehensive Plan Future Land Use Map
  - Waterfront Station Planned Unit Development (PUD)
  - Florida Avenue Market
  - NoMa
  - Rhode Island Avenue Metro station area
  - L'Enfant Plaza Metro station area designated for high-density development
  - Federal Center SW Metro station area designated for high-density development
  - Buzzard Point, SW
- Unzoned current/future opportunity sites
  - Armed Forces Retirement Home south section and the cloverleaf
  - Poplar Point (two sites)
- Other current/future opportunity sites: not high density; Metro adjacent
  - Friendship Heights Metro station area sites designated for Mixed Use Medium residential/commercial development
  - Intelsat site at Van Ness Street and Connecticut Avenue, NW designated for medium-density residential development

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Friendship Heights
Intelstat
Soldier's Home
Rhode Island Ave
Florida Ave Market
M & 22nd Sts NW
Farragut
5th & K Sts NW
NoMa
L'Enfant Plaza
Federal Center SW
Waterfront Station
Buzzard Point
Poplar Point (2 Sites)
Congress Heights

Analysis Areas
Height Study

Office of Planning ~ January 30, 2013

Government of the District of Columbia

This map was created for planning purposes from a variety of sources. It is neither a survey nor a legal document. Information provided by other agencies should be verified with them where appropriate.

Study Areas

Topographic Bowl

  - Congress Heights Metro station area designated Mixed Use Medium residential/commercial development, implemented through PUD
- Downtown (L'Enfant City) sites: high density
  - 17th Street/Connecticut Avenue at K Street, NW
  - 5th and K Streets, NW
  - 22nd at M Streets, NW

Appendix A provides maps of the specific properties considered. In general, the properties were limited to those designated for higher density development in the Comprehensive Plan. For each location, PES tested the feasibility of new office and residential development of taller buildings at the four different height limits.

The steps in the analytical process included answering the following questions:

1) **How much does it cost to build higher-rise buildings?** Structura, Inc. and James G. Davis Construction Corporation prepared construction cost estimates for office and residential developments at 130-, 160-, 200- and 250-foot heights.

2) **Do market rents support higher-rise construction?** PES evaluated the market conditions and supportable rents in each of the 15 test locations to test feasibility at different heights given prevailing land values and rents. For areas of greater demand and higher rents, additional testing was required to determine whether the prevailing rents could support the greater costs of higher-rise construction in light of higher land costs and real estate taxes.

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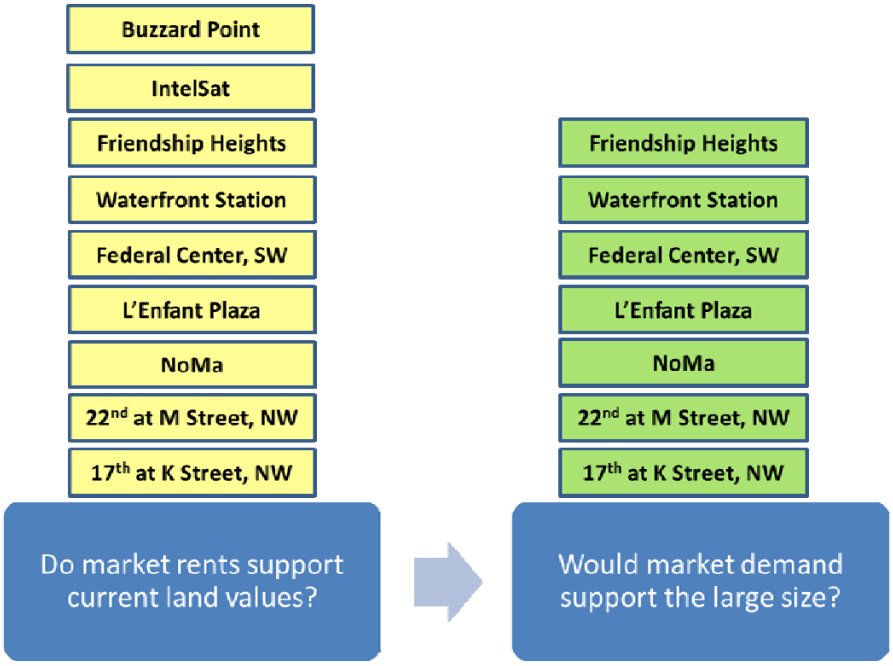
Locations Supportive of High-Rise Office Development



3) **Is the market demand sufficient to justify the size of a higher-rise building?** Even with high rents, the scale and pace of higher-rise construction will respond to a series of difficult calculations/assessments made by individual developers and property owners weighing risk and return.

4) **In what areas and under what circumstances would building owners expand by adding new floors?** PES prepared a second series of financial analyses to test building owners' likely response to an increase in the building heights limits, focusing on the potential to add new floors to existing buildings.

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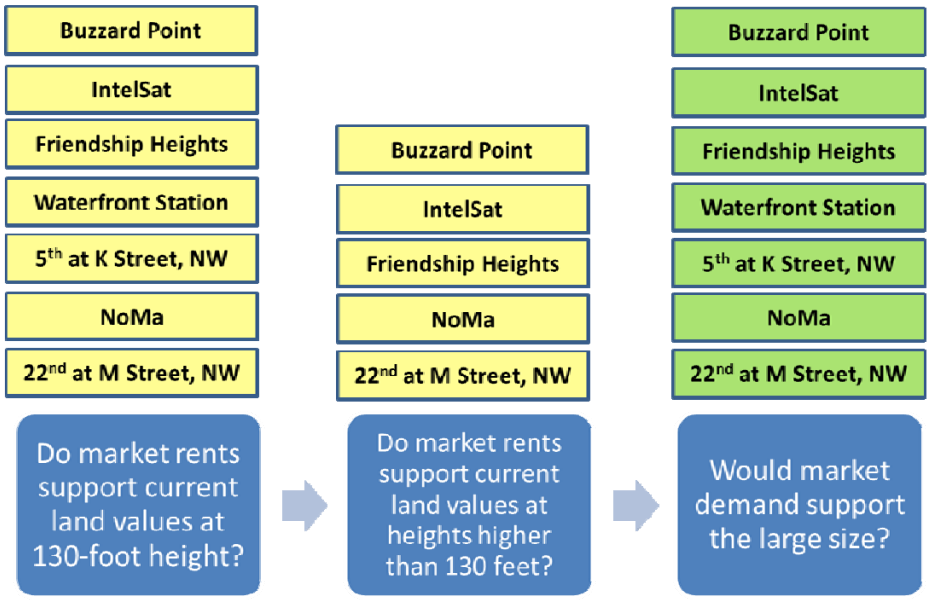
Locations Supportive of High-Rise Apartment Development



5) **How much development would an increase in the building height limit generate District-wide?** PES extrapolated the results of the 15 study areas to a larger estimate of the District-wide potential for higher-rise construction.

6) **How would increasing the building height limits affect employment and District tax revenues?** Considering the new jobs and residents attracted to the District, PES analyzed the effect on property values and estimated potential property tax revenues to the District government along with other key tax revenues.

The final section reviews issues raised in the financial and impact analyses and recommends policy approaches to avoid some of the prospective negative impacts.

Given this analysis's dependence on current and near-term market conditions, its conclusions about the ability of the market to support higher-rise development are valid for the next 5 to 10 years. The fiscal impact considers the net new tax revenues generated by higher-rise development over a 20-year period to 2040. Revisions to the Height of Buildings Act will guide District development for a much longer time and the long-term vision for the District's growth should consider the next 100 years. Over time, market conditions will change drastically. As the city continues to attract new residents and demand increases for new housing and office space, rents are likely to continue climbing. Over the 100-year

future, those economic forces will shift the market realities, making it possible that market support for higher-rise development will emerge in many of the areas that do not now support high density.

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II. Real Estate Development Decisions

Feasibility analysis considers both the extent of market demand for space and the financial return that could be generated by development. Financial feasibility relates the costs of development – land, construction "hard" costs (e.g., bricks and mortar costs) and "soft" costs (e.g., architectural, legal and developer fees, financing and permit costs) – to the potential future revenues from operation and/or sale. Developers and investors have target rates of return that determine whether or not they will develop or invest in a building. Those returns vary by land use, location and the returns available from other less-risky investments (e.g. bonds).

Real estate development decisions always involve a weighing of risk versus return. While not obvious to real estate non-professionals, development risks are multiple and often daunting. Success requires offering the right product in the right location at the right time in the market.

Risk/Reward Analysis
Five broad challenges and risks impact development:

- **Acquisition** of a competitive site well situated to attract tenants may require assembly of several parcels. Current owners may not be amenable to selling at the same time, and some may demand excessive prices.
- **Development approvals** can pose a major hurdle. Community opposition can delay or prevent development at a scale that would support the development costs. Reviews by multiple agencies can be quite time-consuming and costly.
- **Design** to provide the type of space tenants are seeking is essential to success. The challenge lies in meeting those design demands within the development budget dictated by future rents.
- **Financing** is largely affected by timing and economics. The availability of real estate development financing depends on the potential returns from competitive investments (e.g., stocks), the state of real estate markets and investors' perceptions about future conditions. Timing of development relative to economic and financial market cycles is critical to securing outside investment.
- **Market timing** is often beyond anyone's control due to the time required to secure approvals and complete construction. An economic downturn could constrain the pace of lease-up, achievable rents and major anchor tenants' willingness to commit to a lease. Given that a development project typically requires a minimum of three to four years, market timing is pivotal. "Carry costs," such as real estate taxes, interest on land acquisition loans and other predevelopment costs can be quite high, and can make the difference between profitability and losses.

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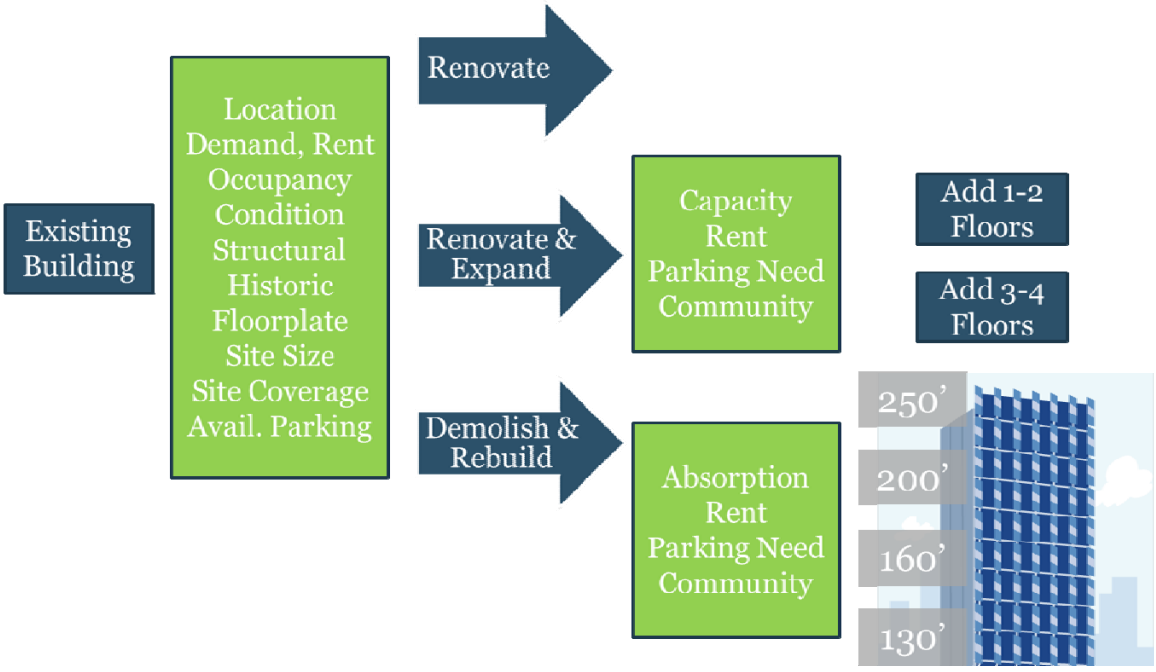
Development Decision Factors

Decisions on actual development and/or redevelopment of specific buildings reflect both physical and financial considerations.

Development Decision Tree



Financially, redevelopment of an existing building depends upon a potential up-side return that outweighs the significant costs and risks. Much of Washington's new construction has replaced low-scale buildings and parking lots where the new development is much larger and has much higher rents. The decision to redevelop a viable office building is distinctly more difficult. A well-leased existing Downtown office building, for example, carries such a high value that redevelopment would be justified only under a narrow set of conditions:

- a substantial potential increase of space;
- higher potential rents due to better/more modern design, amenities and systems;
- expiration of major tenant leases;
- an aging structure needing major reinvestment to remain competitive; and/or
- a major anchor tenant seeking a block of space not available in other buildings.

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Anchor Tenants/Pre-Leasing

In today's office development environment, anchor tenants are essential. Given the risks inherent in development, today's investors typically require new buildings to be 40 to 60 percent pre-leased before development financing is provided. Reaching that level of pre-leasing depends heavily on a project's ability to attract large anchor office tenants that lease at least 100,000 square feet of space. In the District market, such anchors have come most consistently from the legal profession and/or the Federal government. Such anchors are limited in number.

Washington had only 86 business (non-governmental) establishments with 500 or more employees (associated space demand of 100,000 square feet or more) in 2011. There are a few additional international organizations (e.g., the World Bank) that also compete in the private office market. However, many of those entities, such as universities and hospitals, own their own facilities and are not available to anchor speculative office buildings.

Trophy buildings and other well-located Class A buildings rarely lease space to federal agencies as the high rents conflict with budgetary considerations. The General Services Administration (GSA) is unlikely to pay the rent premium associated with the views and higher construction costs of a higher-rise building. Furthermore, current GSA policy emphasizes shrinking the Federal footprint in private office space, reducing square feet per employee and making better use of government-owned space.

The larger buildings made possible by raising building heights would need to secure much larger pre-leases unless the project could be phased or developed in multiple uses. This creates a natural limitation on the pace and scale of new development and will certainly affect developer interest and investment in higher-rise buildings.

Physical Factors

On the physical side, several factors affect a developer's or property owner's ability and willingness to redevelop an existing building to take advantage of an increase in the allowable height. These include:

- **Site and building characteristics** – Few higher-rise buildings are developed on a site smaller than 10,000 to 12,000 square feet. Building characteristics, such as historic designation or configuration, can influence the redevelopment decision.

- **Parking** – A major constraint may be the ability to provide adequate parking to meet tenant demands. The market has allowed parking ratios to decline somewhat in recent years, particularly in multi-family residential development where more and more residents are willing to give up their cars for the convenience of an urban

location with easy Metro access. However, developers note that office buildings with less than 0.7 to 1.0 spaces per 1,000 square feet of leaseable office space experience major push-back from prospective tenants. Attracting the major law firm that would allow the building to secure construction financing is very difficult when reserved parking spaces cannot be provided for all or most of the key partners.

Parking is particularly difficult to provide in the District under the existing system of height limits. A floor of above-ground parking would replace a floor of commercial office space, so most all of the buildings in the core rely on underground parking. There are natural and financial limits on constructing more than three levels of underground parking due to depth to rock and the high water table in many locations. Building more than three levels of underground parking typically is prohibitively expensive.

The parking issue is exacerbated in the case of adding new floors to an existing building. In those cases, no additional parking spaces can be provided to meet the new demand. Leasing the new space would require taking back parking spaces from other tenants.

Valet parking can increase a garage's parking capacity with a higher operating cost. Automated parking could provide relief for some buildings. Such systems require less height per floor and less space per car so that many more spaces can be accommodated within the same depth below the building. Technological advances are improving automated parking systems' efficiency and suitability for a wider range of buildings.

Without this and other solutions, parking limitations could significantly impact developers' ability to maximize development under new building height limits. At 130 feet, three levels of underground parking provide only 0.7 spaces per 1,000 square feet of space. At 160 and 250 feet, that ratio drops to 0.6 and 0.4 spaces, respectively.

In new buildings, this problem could be eased with higher building height limits whereby parking could be developed above ground at a lower per-space cost than constructing underground parking. Developers could size their buildings in scale with the market and devote some of their zoning envelope to parking, assuming that market land prices would adjust to reflect that need. Design guidelines would be needed to insure that all street edges are activated and not blank garage walls.

- **Views** – The marketability and rent premiums associated with views from higher-rise buildings are affected by adjoining and nearby development, so not every higher-rise building could achieve the desired views.

- **Infrastructure** – Many of Washington's infrastructure systems were designed in the early 1900s for a much smaller massing of offices, businesses and residences. Coupled with aging of the water, sewer and power systems, the resulting inadequacies will require continued investment to accommodate and support much taller buildings in the core. These limitations may affect the pace of redevelopment.

- **Road and transit capacity** – Significant intensification of the downtown core development could exceed the capacity of the local and regional transportation systems. The road network is already strained by the level of daily traffic, and the Metro system is very heavily used such that some lines and stations are near capacity during peak hours. However, increased residential development in the Center City could in fact help the congestion by allowing more resident workers to reach their jobs on foot or bike or by bus, streetcar or other transit.

Some developers or property owners will look at these issues for their buildings and decide not to pursue redevelopment even with higher heights. Others may elect to replace an obsolescent building but at less than the maximum allowed height. These factors complicate the projection of market response to changes in the building height limits.

In new development, the greater design flexibility of higher heights could help the District to better compete by offering space with higher ceilings, outstanding views and more windows. Those design preferences have been hard to meet in the Center City due to the high land value and the pressures to maximize square footage. Relative to other cities, in the District the relationship between the height of buildings and the allowable Floor Area Ratio (FAR) is quite close; a building with an allowed height of 130 feet might have an FAR of 8.0 - 11.0. In San Francisco, a building with an FAR of 16 might be between 450 and 650 feet tall. In other cities, there may only be FAR, bulk or setback requirements but no height limits. Because properties are valued based on the development potential, buildings in DC are designed to fill completely their development envelope, squeezing floor-to-floor heights to achieve the maximum number of floors within the height limit. If the FAR were not tied as closely to building height, there would be more opportunities for better design to respond to the needs of today's tenants.

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III. Financial Analysis of New Development

The financial analysis entailed preparing *pro formas* for development of new higher-rise construction and expansion through construction of additional floors for office and multi-family residential development at each of the 15 study areas. A pro forma compares the costs of development to the private investment justified by the future rental revenues in the stabilized year once the building is fully leased. The key drivers include the cost of construction, the cost of land and future rents. The analyses assume construction of Class A buildings designed as rectangular boxes that maximize the square footage that can be built on the site within the maximum height.

Construction Costs

Higher-rise construction costs influence the feasibility of development. Structura, Inc. and the James G. Davis Construction Corporation analyzed construction costs for a dozen major projects in the Washington region to prepare cost estimates for office and residential developments at 130-, 160-, 200- and 250-foot heights. Their report appears in Appendix B. The analysis focused on renovations and new construction of commercial and residential buildings. Renovations, for purposes of this analysis, are vertical expansion of existing buildings at or near the current building height limit.

New Construction

Increases in allowable building heights would not drastically change the design approach to commercial or residential projects in DC, if accompanied by a corresponding increase in the allowable density. The economics and cost of land would continue to press developers to maximize the size of potential buildings, which historically has meant concrete construction with very thin floor systems so as to fit in an extra floor within the height limit.

Construction costs increase for taller structures due to the need for structural enhancements to resist wind and earthquake stresses as well as faster elevators and other enhancements.

Table 1 summarizes construction costs, organized by building type and use. All construction cost data are presented in dollars per square foot. The overall building costs are divided into three components: sitework; a three-level below-grade garage; and the above-ground building. All values are unit costs derived by dividing the construction costs for each component by the above-ground area of the building. Appendix Table B-1 details construction values (unit costs derived as described above) for key construction variables

such as provisions for a high water table, need for deep foundations, logistical challenges and utility upgrades.

Table 1. Construction Costs at Varying Heights				
	Construction Costs per Square Foot			
	Building Height			
	130 Feet	160 Feet	200 Feet	250 Feet
Office Building				
Sitework	$10.00	$8.00	$6.30	$5.00
Three-Level Below-Grade Garage	$32.00	$30.00	$24.00	$20.00
Office Building	$140.00	$150.00	$160.00	$160.00
Total Cost	$182.00	$188.00	$190.30	$185.00
Residential Apartment Building				
Sitework	$12.00	$9.60	$7.60	$6.00
Three-Level Below-Grade Garage	$32.00	$30.00	$24.00	$20.00
Apartment Building	$155.00	$165.00	$175.00	$175.00
Total Cost	$199.00	$204.60	$206.60	$201.00
Note: Costs expressed in 2013 dollars per gross square foot. Tenant improvement costs are excluded.				
Source: Structura, Inc.; James G. Davis Construction Corporation, 2013.				

An easing of height restrictions could, however, result in more cost-effective building construction values if the increase in building heights were accompanied by a smaller increase in allowable Floor Area Ratio (FAR).[3]. Developers would be able to incorporate more cost-effective structural and mechanical systems in their commercial buildings while responding to current market demands. In general, structural steel would become a viable option for office buildings if slab-to-slab heights were no longer the critical design factor, as structural steel buildings are inherently more cost effective (government buildings with protective design requirements excluded).

Building Additions

The ability of an existing building to support additional floors depends upon the load factors incorporated in its initial construction. Unless the existing structure can bear the additional load, vertical expansion becomes prohibitively expensive. Two types of buildings are most likely to be able to support additional floors:

- industrial type buildings designed and constructed for manufacturing or storage; and

[3] Above-ground building square feet divided by land square feet.

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Office Rent Factors

Low office rents reflect the lack of demand from major office tenants for such locations. For major corporate and other office tenants, location decisions are influenced by numerous factors, including:

- accessibility (auto and transit);
- clustering for the advantages of face-to-face interaction;
- proximity to executive housing, responding to decision makers' commuting time;
- proximity to and ability to attract technical labor;
- proximity to major institutions;
- customer accessibility;
- visibility and image associated with Downtown and other select locations;
- retail and service amenities for businesses and their employees (e.g., restaurants); and
- quality environment that is clean, safe and attractive.

- commercial buildings of eight to ten stories constructed prior to 2000, where actual in-place concrete strength and generous design loads provide adequate support for additional floors.

While increasing the density of existing buildings by way of vertical expansion may be economically feasible when considering the addition of one to three levels, beyond that, the costs rise very significantly due to the required enhancements to the building structure. Developers are unlikely to add four or more levels to an existing building.

Table 2. Construction Costs for Building Expansions of Different Sizes

	Costs per Square Foot	
	Number of Additional Levels	
	Two	Four
Office Building		
Sitework	$6.00	$4.00
Three-Level Below-Grade Garage[1]	$9.00	$15.00
Office Building[2]	$135.00	$140.00
Total Cost	$150.00	$159.00
Residential Apartment Building		
Sitework	$6.00	$4.00
Three-Level Below-Grade Garage	$9.00	$15.00
Apartment Building[2]	$150.00	$155.00
Total Cost	$165.00	$174.00

Note: Costs expressed in 2013 dollars per gross square foot. Tenant improvement costs are excluded.

[1]Garage costs are improvements to underground columns and supports.

[2]Building cost includes replacement of the façade on the existing building, core stiffening/strengthening and accommodations for tenant occupancy during construction.

Source: Structura, Inc.; James G. Davis Construction Corporation, 2013.

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Required Minimum Rents for New Construction

PES used these construction cost estimates in generic pro formas to test the feasibility of development in locations with low land values without reference to a specific location. This analysis quantified the full-service[4] minimum rent required for successful higher-rise development. The pro forma relates costs to revenues and calculates the potential return to the developer.

Pro forma analysis requires a wide range of inputs and assumptions about development costs and other factors. These are summarized in Appendix Table C-1. The office pro forma appears in Appendix Table C-2. For office development in an area with relatively low land costs (defined as $20 per FAR square foot, annual rents per leaseable square foot would need to meet or exceed the following levels:

Height In Feet	Minimum Required Full-Service Office Rent
130	$47.50
160	$48.50
200	$48.75
250	$48.50

Despite low land values, these minimum rents are relatively high due to the high costs of new construction and other related development costs.

Incorporating the higher-rise construction costs into pro forma analyses for multi-family rental residential development (Appendix Table C-3) yields the following minimum required rents:

Residential Rent Factors
Multi-family residential development responds to households' location factors, including

- accessibility (auto and transit);
- proximity to jobs;
- parks, open space, recreational and other amenities;
- restaurants, retail and other urban amenities;
- neighborhood quality and walkability;
- personal safety; and
- school quality.

[4] Full-service rents include utilities, real estate taxes, janitorial and other operating expenses.

Height In Feet	Minimum Required Monthly Rent for a Typical 750 Square-Foot One-Bedroom Apartment	
	Per Square Foot	Per Unit
130	$2.91	$2,180
160	$2.99	$2,240
200	$2.95	$2,210
250	$2.85	$2,140

Financial Analyses for Individual Study Areas

For each of the 15 individual study areas, PES prepared office and multi-family residential development pro formas. The key cost inputs were summarized in Appendix Table C-1. The conversion from building heights to number of stories, shown in Appendix Table C-4, assumed average slab-to-slab heights of 11.5 feet for office space (9.0-foot clear ceiling height) and 9.7 feet for residential units (8.0-foot clear ceiling height). Table 3 provides rent-related inputs, including rents, operating expenses and parking rates. Also included are tenant improvement costs, because these allowances are part of the rent negotiations and vary by location. These data were developed through multiple sources of market information, including direct contact with active developers, CoStar office market data, Internet searches for available apartments, Internet survey of parking rates and review of recent sales transactions and assessed land values.

Developers have required minimum returns that vary by use, location and the state of the financial markets. At this point in time, "threshold" cash-on-cash returns average about 6.0 percent for trophy[5] office buildings, 6.5 percent for other Class A office buildings and 7.0 percent for apartment buildings.

In each case, the new development was assumed to occupy the full zoning envelope, e.g., building a multi-story building with no set-backs on upper floors. While one goal of the push to revise building height limits is to introduce greater variety into the massing of future buildings, this analysis focused on the maximum potential impact of raising the building height limits. It assumed that the zoning limits on FAR would be changed accordingly so that height remains the key factor in how much space can be built.

[5] Trophy buildings occupy the most prestigious addresses and offer a very high level of finishes, amenities and tenant services.

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Table 3. Draft Pro Forma Model Inputs													
	Rents per Sq. Ft.			Tenant Improvements per Sq. Ft.		Level of Demand		Land Value per FAR Sq. Ft.	Office Operating Expenses per Sq. Ft.		Residential Operating Expenses per Sq. Ft.		
Study Area	Office (FS)	Retail (NNN)	Apt - I BR	Office	Retail	Commercial	Residential		Op. Exp	RE Tax	Op. Exp	RE Tax	Parking Rates
17th at K	$70-$75	$60	NA	$90	$80	High	NA	$250	$15.00	$13.00	NA	NA	$300
22nd at M	$55-$60	$45	$3.90-$4.10	$65	$65	High	High	$190	$11.00	$10.00	$4.00	$4.00	$250
NoMa	$45-$50	$35	$3.00-$3.50	$60	$70	Medium to High	High	$80	$9.00	$8.00	$4.00	$3.25	$190
5th at K Street, NW	$35-$40	$30	$2.80-$3.20	$50	$65	Medium	High	$80	$9.00	$6.00	$4.00	$3.00	$220
Florida Avenue Market	$30-$35	$20	$2.40-$2.80	$50	$35	Medium	Medium to High	$40	$7.00	$6.00	$4.00	$2.50	$150
L'Enfant Plaza	$45-$50	$35	$2.40-$2.80	$60	$70	Medium	Low to Medium	$100	$9.00	$7.00	$4.00	$2.50	$250
Federal Center SW	$45-$50	$30	$2.30-$2.70	$60	$70	Medium	Low to Medium	$100	$9.00	$7.00	$4.00	$2.25	$250
Waterfront Station	$35-$40	$25	$2.60-$2.90	$50	$50	Low to Medium	Medium	$45	$9.00	$5.00	$4.00	$2.75	$210
Friendship Heights	$45-$50	$50	$3.00-$3.40	$60	$65	Low	High	$75	$9.00	$9.00	$4.00	$3.25	$200
IntelSat	$40-$45	$35	$2.90-$3.30	$55	$60	Low	High	$60	$9.00	$8.00	$4.00	$3.25	$200
Rhode Island Avenue	$30-$35	$20	$2.30-$2.50	$50	$35	Low	Low to Medium	$35	$7.00	$5.00	$4.00	$2.25	$150
Poplar Point	$30-$35	$20	$2.30-$2.50	$50	$60	Low	Medium	$20	$9.00	$5.00	$4.00	$2.50	$150
Congress Heights	$25-$30	$20	$1.80-$2.00	$30	$40	Low	Low	$15	$7.00	$4.00	$4.00	$2.00	$100
Buzzard Point	$35-$40	$30	$2.70-$3.10	$50	$60	Low	Medium	$35	$9.00	$6.00	$4.00	$2.75	$200
Soldiers Home (AFRH)	$25-$30	$18	$2.20-$2.50	$30	$30	Low	Medium	$30	$7.00	$4.00	$4.00	$2.00	$100

Source: CoStar; Apartment Building Websites; Recent Land Transactions; and Partners for Economic Solutions, 2013.

Near-Term New Office Construction

Real estate, like politics, is all local. The feasibility of different types of development at different heights depends directly on the rents and prices that can be charged. The rents/prices reflect the current locational advantages of each site.

The individual new office construction pro formas that correspond to each study area appear in Appendix Tables C-5 through C-19. In testing whether the potential returns from development at different height limits would justify the costs incurred in the short term, the list of suitable locations was further restricted. Table 4 summarizes the achievable returns from office development at varying height levels. Study areas highlighted in green are those where the potential return exceeds the required threshold return of 6.5 percent. At lower returns, projects would be unable to attract private investment.

Table 4. Achievable Returns on Investment[1] Resulting from High-Rise Office Development at Various Heights, Selected Study Areas

Study Area	Building Height in Feet			
	130	160	200	250
17th at K	7.0%	6.9%	7.1%	7.3%
22nd at M	6.8%	6.7%	6.8%	7.1%
NoMa	7.4%	7.4%	7.5%	7.8%
5th at K Street, NW	5.9%	5.8%	5.9%	6.1%
Florida Avenue Market	5.8%	5.7%	5.8%	6.0%
L'Enfant Plaza	7.3%	7.2%	7.3%	7.6%
Federal Center SW	7.3%	7.2%	7.3%	7.6%
Waterfront Station	6.7%	6.6%	6.7%	6.9%
Friendship Heights	7.4%	7.3%	7.4%	7.7%
IntelSat	6.8%	6.7%	6.8%	7.1%
Rhode Island Avenue	6.2%	6.1%	6.1%	6.3%
Poplar Point	5.9%	5.8%	5.8%	6.1%
Congress Heights	5.9%	5.7%	5.7%	6.0%
Buzzard Point	6.7%	6.5%	6.6%	6.9%
Soldiers Home (AFRH)	5.6%	5.4%	5.5%	5.7%

Note: [1]Calculated as cash-on-cash return, i.e., stabilized net operating income divided by total development costs.

Green highlighting denotes those options that meet the threshold return for financial feasibility (6.5 percent).

Source: Partners for Economic Solutions, 2013.

From a financial feasibility standpoint, the raising of height limits would have relevance for only a few potential locations that offer sufficient economic returns to justify the additional costs of higher-rise construction as new development. Only nine of the 15 study areas have market rents that could support higher-rise office construction over the next 5 to 10 years:

- 17th Street/Connecticut Avenue at K Street, NW
- 22nd at M Street, NW
- NoMa
- L'Enfant Plaza
- Federal Center, SW
- Waterfront Station
- Friendship Heights
- IntelSat
- Buzzard Point

Over the long-term future, increasing citywide demand will likely support higher-rise offices in more locations.

New Residential Construction

Appendix Tables C-20 through C-33 provide pro forma analyses for new multi-family rental residential development for the individual study areas. The 17th at K Street, NW study area was not tested as a suitable residential location due to its high value for office development. Table 5 summarizes the results. Again, the study areas highlighted in green could provide adequate returns equal or greater than the required threshold return of 7.0 percent.

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Table 5. Achievable Returns on Investment[1] Resulting from High-Rise Apartment Development at Various Heights, Selected Study Areas				
	Building Height in Feet			
Study Area	130	160	200	250
22nd at M	7.0%	6.9%	6.8%	7.0%
NoMa	7.6%	7.5%	7.2%	7.5%
5th at K Street, NW	7.0%	6.8%	6.6%	6.8%
Florida Avenue Market	6.9%	6.7%	6.4%	6.6%
L'Enfant Plaza	5.7%	5.6%	5.4%	5.6%
Federal Center SW	5.5%	5.4%	5.2%	5.4%
Waterfront Station	7.0%	6.8%	6.5%	6.7%
Friendship Heights	7.5%	7.3%	7.1%	7.3%
IntelSat	7.6%	7.4%	7.2%	7.4%
Rhode Island Avenue	6.2%	6.0%	5.7%	5.9%
Poplar Point	6.8%	6.5%	6.2%	6.4%
Congress Heights	5.2%	4.9%	4.7%	4.8%
Buzzard Point	7.8%	7.6%	7.3%	7.5%
Soldiers Home (AFRH)	6.4%	6.2%	5.9%	6.1%
Note: [1]Calculated as cash-on-cash return, i.e., stabilized net operating income divided by total development costs.				
Green highlighting denotes those options that meet the threshold return for financial feasibility (7.0 percent).				
Source: Partners for Economic Solutions, 2013.				

Seven areas meet the threshold returns for development at 130 feet, based on current market conditions, indicating that they could support higher-rise apartment construction over the next 5 to 10 years:

- 22nd at M Street, NW
- NoMa
- 5th at K Street, NW
- Waterfront Station
- Friendship Heights
- IntelSat
- Buzzard Point

At 160 feet and above, apartment development would not be financially feasible at 22nd at M Street, NW, 5th at K Street, NW, and Waterfront Station. Apartment development at 160 feet and above would be feasible in NoMa, Friendship Heights, IntelSat and Buzzard

Point. However, in the longer term (10+ years), market conditions may change sufficiently to allow these areas to support higher-rise residential development.

Condominium Development

While market economics would support condominium development in some of these areas, condominiums are unlikely to be developed in higher-rise buildings due to the number of units that would be delivered at one time. The condominium market is very sensitive to economic cycles, and the market for units priced starting at $500,000 is somewhat limited. Delivering more than 150 units at one time would require carrying those units for more than two years, incurring high carry costs and risking sales during an economic down cycle.

At this point in time, market economics do not support condominium development. One possibility would be construction of "skinny" buildings with a smaller footprint and many fewer units. Another would be mixed-use development that combined condominiums with a hotel or office space.

Building Additions

When considering the potential for additions to existing buildings in response to higher building height limits, the economics are somewhat more favorable. Generally, the potential for additional floors is governed by the available bearing capacity of the existing structure. In most cases, this means that concrete buildings of eight or more stories can accommodate one to two additional stories. However, additions are not suitable for every such building due to the complications of upgrading the building core, relocating rooftop equipment and managing the impacts on existing tenants if the building is not vacant.

The costs of building additions are significantly lower than construction of new replacement buildings, and the additions do not require the loss of a valuable income-producing asset. The market risks also are lower by adding a smaller block of new space at one time. Most often, additions are timed to coincide with renovations to the rest of the building, allowing for faster construction than would be possible when working around the schedules and needs of existing tenants. Synching the two actions also allows for changes to the building core to serve the upper floors and movement of any rooftop building equipment. It ensures that both the existing and new space offer Class A spaces able to compete in the market.

For office space expansions, Table 7 summarizes the results of the financial analysis. Study areas that have no buildings suitable for additions are excluded. The pro formas appear in Appendix Tables C-34 through C-42.

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Table 7. Achievable Returns on Investment[1] Resulting from Additions of Two to Four Levels to Existing Office Buildings[2], Selected Study Areas		
	Additional Levels	
Study Area	Two	Four
17th at K	10.7%	10.2%
22nd at M	9.5%	8.9%
NoMa	8.1%	7.5%
5th at K Street, NW	6.0%	5.5%
L'Enfant Plaza	8.4%	7.8%
Federal Center SW	8.4%	7.8%
Waterfront Station	6.4%	5.8%
Friendship Heights	7.8%	7.2%
IntelSat	6.8%	6.3%
Note: [1]Calculated as cash-on-cash return, i.e., stabilized net operating income divided by total development costs.		
[2]Assumed to be Class A buildings of eight or more stories built in last 20 years. The entire façade is replaced without otherwise renovating the existing space. Occupancy is maintained during construction.		
The following study areas have no buildings suitable for vertical expansion: Florida Avenue Market; Rhode Island Avenue; Poplar Point; Congress Heights; Buzzard Point; and Soldiers Home (AFRH).		
Green highlighting denotes those options that meet the threshold return for financial feasibility (6.5 percent).		
Source: Partners for Economic Solutions, 2013.		

Only nine study areas have existing office buildings suitable for vertical expansion. Seven would provide adequate returns on investment (in excess of 6.5 to 7.0 percent) to justify the addition of two floors during the next 5 to 10 years:

- 17th Street/Connecticut Avenue at L Street, NW
- 22nd at M Street, NW
- NoMa
- L'Enfant Plaza
- Federal Center SW
- Friendship Heights
- IntelSat

The higher costs associated with adding four levels rule out feasibility for larger building additions in the IntelSat area. As demand increases over time, more areas may achieve rents high enough to justify building additions.

Residential development results are summarized in Table 8 and detailed in Appendix Tables C-43 through C-49. They indicate that each of the seven study areas that have residential buildings suitable for additional levels would provide returns on investment that would justify the addition of two or four levels. The other eight study areas do not have existing buildings suitable for vertical expansion.

Table 8. Achievable Returns on Investment[1] Resulting from Additions of Two to Four Levels to Existing Apartment Buildings[2], Selected Study Areas

Study Area	Additional Levels	
	Two	Four
22nd at M	12.1%	11.6%
NoMa	10.1%	9.5%
5th at K Street, NW	9.0%	8.5%
L'Enfant Plaza	7.9%	7.4%
Federal Center SW	7.6%	7.1%
Waterfront Station	8.1%	7.6%
IntelSat	9.3%	8.8%

Note: [1]Calculated as cash-on-cash return, i.e., stabilized net operating income divided by total development costs.

[2]Assumed to be Class A buildings of eight or more stories built in last 20 years. The entire façade is replaced without otherwise renovating the existing space. Occupancy is maintained during construction.

The following study areas have no buildings suitable for vertical expansion: 17th at K Street, NW; Florida Avenue Market; Friendship Heights; Rhode Island Avenue; Poplar Point; Congress Heights; Buzzard Point; and Soldiers Home (AFRH).

Green highlighting denotes those options that meet the threshold return for financial feasibility (7.0 percent).

Source: Partners for Economic Solutions, 2013.

Market Feasibility by Study Area

To further refine the analysis of the likelihood of redevelopment or expansion with greater building heights, PES considered the mix of these factors, the nature of development, the availability of sites and the absorption history in the study areas where rents would support higher-rise construction over the next 5 to 10 years based on current market conditions. The following matrix summarizes higher-rise development potentials by study area. "Older buildings" refers to structures built from 1980 to 2000, which would be likely to have excess bearing capacity that could support additional floors.

Office Demand Projections Evaluation Matrix					
Study Area	Private Market Demand	Site Availability			Support Retail, Services
		Vacant	Low-Density	Older Buildings	
17th at K	High	No	No	Yes	High
22nd at M	High	No	Yes	Yes	High
NoMa	High	Yes	Yes	No	High
L'Enfant Plaza	Medium	No	No	Yes	Medium
Federal Center SW	Medium	No	Yes	Yes	Medium
Waterfront Station	Medium	Yes	No	No	Medium
Friendship Heights	Medium	Yes	Yes	No	High
IntelSat	Low	Yes	Yes	Yes	Medium
Buzzard Point	Low	Yes	Yes	Yes	Low

The low levels of private-market demand evidenced in the IntelSat and Buzzard Point study areas suggest that a developer would have difficulty in meeting the pre-leasing requirement for a higher-rise office building and in financing the development. Development at a lower height would reduce the likelihood of delivering more space than the market could bear.

Higher-rise office development is most likely to occur in the near term in:

- 17th at K Street;
- 22nd at M Street;
- NoMa;
- L'Enfant Plaza;
- Federal Center, SW;
- Friendship Heights; and
- Waterfront Station.

Given the high demand for rental housing in the District, market constraints are less likely to rule out development locations. The higher rent levels associated with the seven study areas that showed financial feasibility reflect the demand in those areas and the supportive 24-hour environments with the amenities that urban residents value, such as restaurants, night life, grocery stores, services and open space. Each of these study areas shown in the following matrix could attract and support higher-rise residential development in the next 5 to 10 years. However, the highest building at 250 feet, probably more than 500 units, would push the limits of the market in most of the study areas.

Apartment Demand Projections Evaluation Matrix					
Study Area	Private Market Demand	Site Availability			Support Retail, Services
		Vacant	Low-Density	Older Buildings	
22nd at M	High	No	Yes	Yes	High
NoMa	High	Yes	Yes	No	High
5th at K	High	Yes	Yes	Yes	Medium
Waterfront Station	Medium	Yes	No	No	Medium
Friendship Heights	High	Yes	Yes	No	High
IntelSat	High	Yes	Yes	Yes	Medium
Buzzard Point	Medium	Yes	Yes	Yes	Low

As demand increases over time, other areas are likely to achieve rents high enough to support higher-rise development.

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IV. Higher-Rise Development Projections

In assessing the economic impacts of new higher-rise development, the critical question is whether new higher-rise development would exceed the levels of development that would occur without an increase in building heights. Without a net increment of additional development, new higher-rise development would have minimal benefits to the District's economy. This section extends the analysis to consider the impact on overall development levels District-wide.

District-Wide Office Development Projections

Market demand drives the potential opportunities for the District to benefit from increased building heights. On a conceptual level, the heights of buildings have limited impact on the regional demand for office space and the District's share of that regional demand. Office demand is driven by growth in the number of employees in industries typically housed in office space. The development of new office buildings in the region does not in itself increase the number of office workers. Regional employment is subject to many other factors, including national economic conditions, federal government spending levels, the mix of regional industries and the availability of business capital.

Development can influence the distribution of jobs within the region and the District's capture of those jobs if:

- it provides space in preferred locations that are otherwise built out (e.g., prestige locations proximate to the Capitol or other anchors, along Connecticut or Pennsylvania avenues or with desirable views of the Capitol, the Mall or the rivers);
- the expansion of the office inventory results in lower rents;
- the design of new structures made possible by higher height limits provides a better, more competitive office product;
- higher residential density allows the District to attract a higher share of the region's young knowledge workers and the companies that wish to employ them; and
- the higher density of office employees supports greater retail amenities that improve the business districts' appeal to tenants.

Preferred Locations

Much of the Golden Triangle has been built out with development occurring primarily in trophy locations with high rent premiums. The East End also is nearing build-out. Greater building heights would allow those companies interested in walkable access and views to

locate in these prime Washington locations, attracting or retaining a few such companies that otherwise might decide to locate in a suburban location. For those few tenants, higher heights could boost the District's capture of regional office activity.

Rents

A large expansion of the office development potential, i.e., square feet allowed by zoning, would likely reduce land values per developable FAR square foot. Unless offset by the higher costs of higher-rise construction, that would tend to lower office rents. Significant reduction in office rents and other occupancy costs would increase the market demand for office space. In similar fashion, reducing the costs of providing parking spaces by shifting to above-ground parking could reduce occupancy costs and rents.

Better, More Competitive Products

Some market trends and preferences are pushing toward building replacement, including the emphasis on "green" buildings with Leadership in Energy and Environmental Design (LEED) certification. Companies are changing their mix of employees and required spaces. Historically, law firms and other major corporate tenants required large spaces for law libraries, records storage and clerical support services. Those space needs were compatible with windowless spaces at the center of buildings with large floorplates. With technological changes and higher employee densities, office tenants are seeking offices with more access to natural light with smaller individual work stations but a much higher share of the space designed for group collaborations. As a result, tenants are seeking office space with a higher proportion of windows, ceilings of nine feet or higher and clear spans.

Those design preferences have been hard to meet in the Center City due to the high land value and the pressures to maximize square footage. Relative to other cities, in the District the relationship between the height of buildings and the allowable FAR is quite close; a building with an allowed height of 130 feet might have an FAR of 8.0 - 11.0. In San Francisco, a building with an FAR of 16 might be between 450 and 650 feet tall. In other cities, there may only be FAR, bulk or setback requirements but no height limits. Because properties are valued based on the development potential, buildings in DC are designed to fill completely their development envelope, squeezing floor-to-floor heights to achieve the maximum number of floors within the height limit. In the process of squeezing down slab-to-slab heights, some building systems have become more expensive and less cost effective. There are few gaps between Center City buildings, restricting the amount of space with direct access to windows. Virtually no above-ground parking is built because it counts against FAR and height, so downtown offices depend on much-more expensive underground parking.

As Washington continues to compete in a regional market not impacted by such height limits and design constraints, its long-term ability to compete for future tenants would be enhanced by greater building heights. Also important would be the dramatic views available to some taller buildings.

Larger Knowledge Workforce

Providing more housing near employment centers would allow the District to continue to attract and accommodate Generation Y young adults who have shown a preference for living a car-lite urban lifestyle. Companies dependent on these knowledge workers will find Washington to be a more attractive location by virtue of their enhanced ability to attract and retain younger workers.

Better Neighborhood Amenities

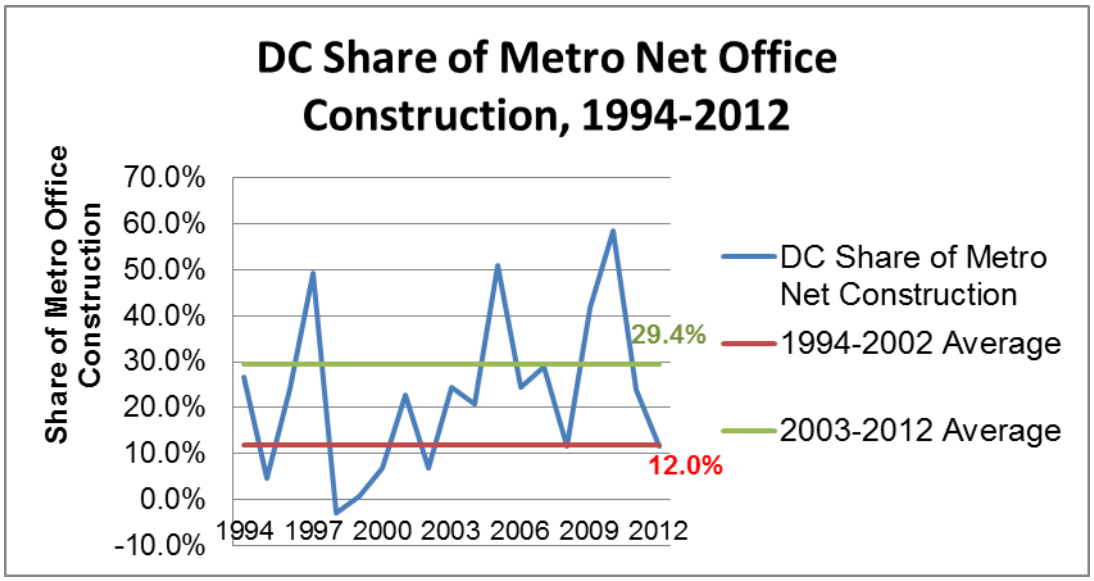
In some cases the concentration of additional employees associated with higher-rise office development would support additional restaurants, retail and service operations. By enhancing the tenants' daily experiences, these office clusters could become more appealing and competitive with suburban alternatives.

Countervailing Constraints

However, increased development could trigger traffic constraints that reduce the District's appeal to businesses whose owners commute from the suburbs. The District's ability to compete also will be influenced by the competitive factors of improved Metro accessibility to Tysons as well as place-making activities in surrounding jurisdictions.

Impact on District-Wide Office Development

On balance, the enhancements allowed by raising the building heights could potentially increase the District's share of the region's new office development by 1 to 2 percentage points. The District has been improving its share of the region's office development from 12.0 percent from 1994 through 2002 to 29.4 percent from 2003 through 2012. However, the share changes from year to year, ranging from 0 to almost 60 percent, as shown in the following graph.



Metropolitan office development averaged 6,025,000 square feet per year from 2003 through 2012 (shown in Appendix Table C-50) with net absorption averaging 4,244,000 square feet per year. A one- to two-percentage-point increase based on absorption[6] would translate into incremental development of 45,000 to 89,000 square feet annually over the next 20 years, roughly one new higher-rise building every three to four years.

Table 9. Incremental High-Rise Office Development Projections

Study Area	Maximum Building Height			
	130 Feet	160 Feet	200 Feet	250 Feet
Total 20-Year Increment	900,000	1,340,000	1,600,000	1,780,000
Percent of Regional Development	1.0%	1.5%	1.8%	2.0%

Source: Partners for Economic Solutions, 2013.

District-Wide Multi-Family Residential Development Projections

Residential markets are more easily influenced as renters move more frequently than do office tenants. As with office space, raising building heights would help by:

[6] Includes a 5.0-percent allowance for frictional vacancies.

- allowing additional development in locations that are otherwise built-out near Metro stations and other amenities;
- offering a product not otherwise available – units with outstanding views, high ceilings and more windows;
- supporting expansion of neighborhood retail and amenities with higher population densities; and/or
- possibly lowering rents through supply expansion, though higher construction costs limit the potential for significant blocks of new affordable housing in higher-rise construction.

Since 2005, the District's population has reversed long-time trends of decline to begin rising again. Over the last four years, the District's population has risen dramatically, adding an average of 1,085 new residents per month according to the U.S. Census Bureau. The population growth relates to demographic changes with the influx of Generation Y residents (born between the late 1970s and the mid-1990s), the large numbers of Baby Boomers (born between 1946 and 1964) reaching the empty nester stage, many improvements in the city's amenities and quality of life, and increased and lower cost transportation choices in the District, combined with greater regional traffic congestion and higher long-distance regional commuting costs.

As demand/growth exceeded construction, rents escalated rapidly, spurring new development. Coupled with ready availability of financing, this has led to a residential building boom with the authorization of 7,769 apartments in 2011 and 2012. This compares with an annual average of 1,187 new multi-family units authorized by building permit from 2000 through 2010. The rent escalation trend has moderated to 1.0 percent annually as supply has started catching up with demand.

With the influx of new residents, previously under-served neighborhoods are attracting coffee shops, restaurants, service providers and retailers, providing residents with a more complete community and the benefits of walkable retail. That enhanced quality of life then attracts more residents to the District, who take advantage of superior access to transit and jobs in a walkable urban environment. In addition to the city's obvious advantages for persons working in the District, the appeal of its neighborhoods also has attracted residents who work in the suburbs and reverse commute. The 2011 American Community Survey reported that 27.4 percent of District residents commuted to jobs outside of the city.

The Metropolitan Washington Council of Governments (MWCOG) now projects that the District's population will grow from 601,700 in 2010 to 676,326 by 2020, 722,763 by 2030 and 771,165 by 2040. However, a combination of factors including: recent population growth, DC's policy initiatives such as movement toward universal pre-school and streetcar

investments, combined with national trends toward urban development; suggest the District could grow even faster over the next 25 years. The MWCOG forecast represents 31,400 new households from 2010 to 2020, 20,100 from 2020 to 2030 and 21,600 from 2030 to 2040. New housing construction will likely be five percent higher than the household projections to accommodate unit vacancies between tenants and/or owners. Thus, the District will need a net addition of 44,000 new housing units between 2020 and 2040.

The current supply of available sites is unlikely to be able to accommodate this scale of development without significant increases in density. The city's supply of vacant or significantly underutilized sites in high-demand areas near to downtown or to Metro stations is limited. As discussed earlier, redevelopment of existing six- to nine-story apartment buildings is unlikely except in cases of structures in need of major investment, the opportunity for a substantial increase in the size of the building and/or significantly higher potential rents due to better/more modern design, amenities and systems. With competitive pressure from new transit-oriented development in surrounding jurisdictions, the District's ability to achieve its full housing potential will depend on achieving higher densities in transit-accessible locations.

By increasing the availability of residential units in transit-served locations and enhancing neighborhoods, higher-rise apartment construction should be likely to accommodate 25 to 30 percent of this new housing development, or 11,000 to 13,200 units over the next 20 years. Not all of that new development or expansion of existing buildings will create net new units that would not have been developed in the District on other sites or in smaller buildings. While vertical expansion of existing buildings would create net new units, redevelopment would involve demolition of existing units and/or would include units that could have been built under a 90-foot height limit. These replacement units are excluded from the estimate of net new units. As shown in Table 10, the percent of the units in higher-rise buildings estimated to be net new units ranges from 40 percent at the 130-foot height limit (which would accommodate most feasible expansions of existing buildings) to 60 percent at the 250-foot height limit. For the 20-year period from 2020 to 2040, higher building height limits could generate 4,400 to 7,900 net new housing units for the District beyond what could be achieved under current building height limitations. This translates into 4.3 to 7.8 million square feet of net new residential space. During this period, capacity still otherwise exists in many of the submarkets to expand without additional height above 130 feet.

Table 10. Incremental High-Rise Apartment Development Projections				
	Maximum Building Height			
Study Area	130 Feet	160 Feet	200 Feet	250 Feet
Total Projected Housing Units, 2020-2040	44,000	44,000	44,000	44,000
Percent of 2020-2040 Growth in Higher-Rise Buildings	25%	27%	29%	30%
Percent Net New Due to Higher Heights	40%	45%	55%	60%
Total 20-Year Increment of Net New Housing Units	4,400	5,300	7,000	7,900
Source: Partners for Economic Solutions, 2013.				

Impact on Residential Rents

While newly constructed higher-rise apartments are likely to have relatively high rents, expansion of the housing supply should result in lower rents if new supply exceeds the growth in demand. The availability of new apartments will put competitive pressure on existing buildings to renovate and maintain their edge and/or lower their rents. Units that are not as well located and maintained will see a lessening of demand and lower rents.

However, the impacts on prevailing rents are likely to occur primarily at the margin. The District's high costs of development and natural market forces will limit the extent of oversupply and rent reductions over the longer term, though during the down parts of market cycles, the additional supply could lead to lower rents.

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V. Economic and Fiscal Impacts

The potential economic impacts of raising the maximum building heights have nine major components:

1) scale and mix of new development, discussed in the preceding section;
2) market volatility;
3) change in existing building and land values;
4) geographic distribution of development;
5) property and other taxes paid on new development;
6) income, sales and other taxes paid by new residents;
7) job creation;
8) contribution to quality of life and urban amenities that spur higher rents/values and private investment; and
9) impact on housing affordability.

Market Volatility

International competition for financing has benefited the District's office market to a great degree over the past couple of decades. Foreign investors find Washington to be a particularly attractive market with a stable economy and steady demand for space from lobbyists, attorneys and associations. A major factor in their favorable assessment of the District market has been the development approval process and the Height of Buildings Act, which constrain the new supply of space. Rents, occupancies and profitability depend on finding a favorable balance between supply and demand. Washington's market traditionally has benefited from limits that help prevent simultaneous delivery of too much space at one time, which would depress building occupancy rates, rents and property values.

It is more difficult to overbuild the market when new buildings average 200,000 square feet than when they introduce 400,000 square feet of space at one time. Raising the height limits could be expected to increase market volatility if new buildings each start to deliver 300,000 or more square feet of space.

Property Value Impacts

Increases in height limits and developable square feet would increase property values and property tax revenues to the District if the new development rights were created and released gradually. Doubling the building heights does not require doubling the associated

FAR zoning limitations. Height limits could be raised but with a more modest increase in FARs.

If FARs were increased commensurately with building heights, a major increase in the scale of development opportunities could undermine some of the market discipline provided by the limited supply of land coupled with the height limits.
If that lifting of constraints affected investors' confidence in the long-term growth in District property values, they could lower their bid prices in acquiring buildings in the market. That would impact sales prices and property value assessments based on those transactions.

Theoretically, the lifting of the height limit to 250 feet could double the square feet of allowable development in the downtown core. In the balance of supply and demand, the availability of such expansive development potential could be expected to reduce land values per FAR square foot. What is unclear is whether the overall value of all Center City land would be reduced below the current value. Certainly, the larger the increase in development potential, the greater the risk of adverse impacts on land and building values. For a sense of scale, a 10-percent reduction in downtown[7] commercial building values would cost the District $5 million in annual real property tax revenues.

Transferable Development Right (TDR) experience illustrates the impact of oversupply of development potential. In the 1980s when Downtown land values reached $100 per FAR square foot, TDRs traded for as little as $2 to $3 per square foot up to a maximum of $40 per square foot. This reflected the very limited number of receiving areas where the TDRs could be used and the resulting lack of demand.

The major threat to the value of existing buildings is the increased chance of a significant over-building that would undermine the ability of existing buildings to continue to command very high rents.

Geographic Distribution of Development

The prevailing height limits played a major role in encouraging new development in areas previously bypassed by development. Following the 1968 riots, development east of 15th Street, NW essentially stopped until the Golden Triangle was largely built out. Combined with the efforts of the Pennsylvania Avenue Development Corporation and the District's Redevelopment Land Agency to encourage redevelopment and the opening of the Metro system, office development then began to shift to the East End. The pattern repeated as

[7] The area bounded by 2nd Street, NE, I-395, Rock Creek Park and M Street, NW.

the East End approached build-out and development shifted to previously secondary locations, such as NoMa and the Capitol Riverfront.

The availability of significant new Downtown development potential could slow development in other parts of the Center City.

New Tax Revenues

The following fiscal impact analysis draws on the preceding analyses and a series of assumptions and inputs summarized in Appendix Table C-

Property Taxes

Discussed in Section IV, the District-wide projections anticipate a 20-year increase in office development of 0.9 to 1.8 million square feet coupled with 4,400 to 7,900 new residential units. Based on an average office value of $357 to $367 per net square foot (excluding land) and an average residential value of $307 to $325 per net square foot (excluding land value) and current tax rates, this translates into a potential for $16 to $31 million in new annual property tax revenues, measured in constant 2013 dollars. Additional revenues related to commercial development, including sales and employee income taxes, would total $10 to $20 million after 20 years.

As noted earlier, if the introduction of a significant amount of new development potential resulted in a 10-percent loss in value for existing downtown commercial properties, the new tax revenues could be reduced by as much as $5 million annually.

New Taxes Generated by New Residents

Growth in the District's population would increase revenues by a significantly higher rate due to the income and sales taxes paid by new residents – $36 to $64 million annually in new tax revenues. This estimate is adjusted to allow for a five-percent overlap between new employees in higher-rise office buildings and residents of new higher-rise buildings.

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Table 11. Annual District Government Revenues Generated by Higher-Rise Construction After 20 Years				
	Building Height			
	130 Feet	160 Feet	200 Feet	250 Feet
Annual On-Going Revenues				
Real Property Tax[1]	$ 16,237,200	$ 21,748,700	$ 28,702,600	$ 31,288,300
Sales Tax Paid by Project Retailers	579,600	869,400	1,035,000	1,138,500
Sales Tax Paid by Project Residents	2,075,500	2,500,100	3,302,000	3,726,500
Sales Tax Paid by Project Employees	764,000	1,136,000	1,358,000	1,510,000
Income Tax Paid by Project Residents	33,408,800	40,242,400	53,150,400	59,984,000
Income Tax Paid by Project Employees	8,583,800	12,779,500	15,260,200	16,976,900
Total Annual On-Going Revenues	**$ 61,648,900**	**$ 79,276,100**	**$ 102,808,200**	**$ 114,624,200**

Note: Revenues in constant 2013 dollars based on Fiscal Year 2013 tax rates.

[1]Real property tax revenue estimate does not account for any reduction in the value of existing buildings resulting from an increase in development potential significantly in excess of new demand.

Source: Partners for Economic Solutions, 2013.

Net Present Value of Future New Revenues

Incremental tax revenues accrued over a 20-year period of development would total $1.6 billion to $3.0 billion (measured in constant 2013 dollars). Net present value expresses the current value of a future stream of revenues, accounting for the time value of money – the fact that a dollar in hand today is more valuable than a dollar received one year from now. To calculate the net present value of these future incomes, PES assumed an equal level of construction for each of the 20 years, a conservative two-percent annual inflation rate, a discount rate of 4.5 percent based on current rates for 20-year municipal bonds, and a 6.5-percent reversion value to reflect the fact that the taxes continue after the 20-year period. After 20 years, the development at varying building heights would generate the annual revenues shown in the table above; in the first year, incremental taxes would be one-twentieth of those estimated revenues. The net present value of 20 years of new tax revenues ranges from $1.0 billion for the 130-foot height limit up to $1.9 billion for the 250-foot height limit.

This analysis tests the potential fiscal impact of 20 years of development at higher building heights. In fact, the fiscal impacts would be much higher as more higher-rise buildings are constructed.

Table 12. Total and Net Present Value of New Tax Revenues Generated by 20 Years of Development Under New Height Limits		
Building Height	Total New Revenues[1]	Net Present Value of New Revenues[2]
	(In millions of dollars)	
130 Feet	$1,595.8	$1,027.4
160 Feet	$2,052.0	$1,321.1
200 Feet	$2,661.2	$1,713.3
250 Feet	$2,967.0	$1,910.2
Note: [1]Total revenues shown in constant 2013 dollars.		
[2]Net present value based on a 2.0-percent annual inflation, a 4.5-percent discount rate and a 6.5-percent reversion value.		
Source: Partners for Economic Solutions, 2013.		

Job Creation

Development of 0.9 to 1.8 million new square feet of office space in excess of what would be developed under existing building height limits suggests a potential for 6,900 to 13,650 new on-going jobs over the 20-year period. Rounding out that total to include retail and residential operations would bring the total new job count to 7,100 jobs at 130 feet up to 14,000 jobs at 250 feet. Direct jobs are estimated based on an average of 180 square feet of office space per employee, 400 square feet of retail space per employee and 50 dwelling units per employee. Spin-off jobs reflect the multiplier effect of the new workers in the District economy. As the new companies buy services and supplies and their employees spend their paychecks locally, new jobs are created in housing, retail, services, government and other sectors of the economy. The U.S. Bureau of Economic Analysis estimates this multiplier effect based on a massive input-output model that reflects the structure of the District economy. [8] With the growth in the District's base of knowledge workers, 35 percent or 2,500 to 4,900 of these new jobs could be filled by District residents.[9]

Construction would support an average of 920 temporary jobs annually at 130 feet, up to 1,700 jobs at 250 feet. While many of the jobs will be held by workers from other

[8] Spin-off job multipliers are 1.3803 for office jobs, 1.1101 for retail jobs and 1.2238 for housing building services. This means that for every new office employee based in the District, 0.38 jobs are created elsewhere in the District economy.

[9] District residents held 28.2 percent of District-based jobs in 2010.

jurisdictions, roughly 20 percent or 180 to 340 construction-related jobs could be filled by District residents. Construction jobs are estimated based on one direct job per $70,000 of construction expenditures and an employment multiplier of 1.2565. The construction industry is an important source of jobs for lower-skilled residents who may have only a high school education.

Table 13. Total Direct and Spin-Off Jobs Associated with 20 Years of Higher-Rise Development at Varying Heights

	Building Height			
Project Component	**130 Feet**	**160 Feet**	**200 Feet**	**250 Feet**
Operations				
Office	6,902	10,275	12,269	13,650
Retail	78	117	139	153
Residential	108	130	171	193
Total Jobs in Operations	7,088	10,522	12,579	13,996
Construction Period				
Average Annual Full-Time Equivalent Jobs	922	1,187	1,554	1,701

Sources: U.S. Bureau of Economic Analysis; Partners for Economic Solutions, 2013.

Urban Amenities

The attraction of new households to the city's neighborhoods would provide spending support for retail, service and cultural establishments. Several neighborhood business districts are constrained by the limited number of households within easy walking distance. Without a better concentration of spending power, they cannot support the restaurants, coffee shops, grocery stores and drugstores that their residents would like.

The addition of 300 to 500 new households in one neighborhood could support 3,900 to 6,400 square feet of restaurants and neighborhood-serving retail uses. In some cases, that increment may be sufficient to leverage even more development when coupled with existing latent demand not being met in the neighborhood.

New residential buildings would likely accommodate first-floor uses that support and appeal to both their residents and other neighborhood residents. The public realm improvements accompanying new development also could improve neighborhood walkability and connectivity.

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Affordability

The monthly rents required to justify higher-rise construction suggest that new households will have relatively high incomes, estimated to average $135,000 or more. Some residents will shift out of existing units to rent newly built units with views and amenities. Those shifts could open up less expensive units for households with lower rents if the supply of new units keeps pace with or exceeds the growth in demand. However, higher-rise construction is not likely to contribute to economic diversity among District residents.

Higher-rise buildings also will not introduce large numbers of affordable units due to the high development costs. Inclusionary zoning would require eight percent of net new units – 350 to 630 units – to be affordable to households with incomes at or below 80 percent of the Area Median Income (AMI).

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VI. Conclusions

Raising the height limits could help the District expand its population and employment base if focused in areas of high market demand – primarily Center City and selected Metro locations where rents are high enough to support higher-rise construction costs. Residential expansion offers particular development opportunities to take advantage of higher heights. Although not studied, new development in response to higher height limits also could include hotels.

Building Additions

Vertical expansions of existing buildings in response to higher building height limits offer the best potential economic returns, where appropriate and feasible. Generally, the potential for additional floors is governed by the available bearing capacity of the existing structure. In most cases, this means that concrete buildings of eight or more stories can accommodate one to two additional stories. However, additions are not suitable for every such building due to the complications of upgrading the building core, relocating rooftop equipment and managing the impacts on existing tenants if the building is not vacant.

The costs of building additions are significantly lower than construction of new replacement buildings, and the additions do not require the loss of a valuable income-producing asset. The market risks also are lower by adding a smaller block of new space at one time. Most often, additions are timed to coincide with renovations to the rest of the building, allowing for faster construction than would be possible when working around the schedules and needs of existing tenants.

New Development

In new development, the greater design flexibility of higher heights could help the District to better compete by offering space with higher ceilings, outstanding views and more windows. With less pressure to maximize the number of floors within the maximum height, developers could adopt steel construction with somewhat lower per-square-foot construction costs.

Higher densities could support a wider range of business district retail and service amenities. Approximately 500,000 people commute into the District each workday for employment; with more city housing options available, more people employed in the District could live in the District and commute by foot, bicycle or transit. That could

moderate some of growth in commuting pressure on the District's road network. Reverse commuting to jobs in the suburbs could make better use of Metro capacity as well.

However, these benefits do not come without some risks:

- If offered all at once, a substantial increase in the amount of development potential allowed by zoning and height limits could undercut the value of land and existing buildings.
- Similarly, lower investor confidence in the long-term value of Washington real estate due to the greater potential of an over-supply and higher market volatility could result in a shifting of some investment funds away from the District.
- Such a shift could reduce the value of existing buildings and the property taxes generated for the District.
- Paradoxically, an increase in allowable height (if accompanied by a commensurate increase in development potential) also would likely exacerbate land acquisition and assembly problems by raising property owners' expectations and price demands, at least in the short run.

Avoiding those risks would require a careful balancing of the increase in development potential. Allowable FAR can be de-coupled from the height limits. An increase in building heights need not be accompanied by a commensurate increase in FAR zoning limits. The FAR increase could be much smaller with the higher height limits allowing greater design flexibility and variety in building form.

The newly created FAR available for development under the increased building heights could be gradually introduced to the market, perhaps auctioned off periodically with area developers competing for the opportunity to construct a higher-rise building. That would prevent a sudden over-supply of development rights while capturing the value created by the additional development potential and channeling it to specific policy goals, possibly including upgrades to the city's infrastructure and/or funding for affordable housing.

Constraining Factors

In most cases, existing well-leased buildings would not be redeveloped unless the additional density were sufficient to warrant the investment, meaning heights of more than 160 feet. Vertical expansions would be more likely with the buildings able to support one to three additional floors.

Parking could prove to be a major constraint on new development given the prohibitive costs of building more than three levels of underground parking. While parking ratios are

declining, particularly in the residential sector, parking is still a significant factor in office location decisions.

The District's aging infrastructure must continue to be addressed, particularly the power grid. System upgrades by individual development projects are not sufficient to address the overall problems, and infrastructure inadequacies could constrain future development.

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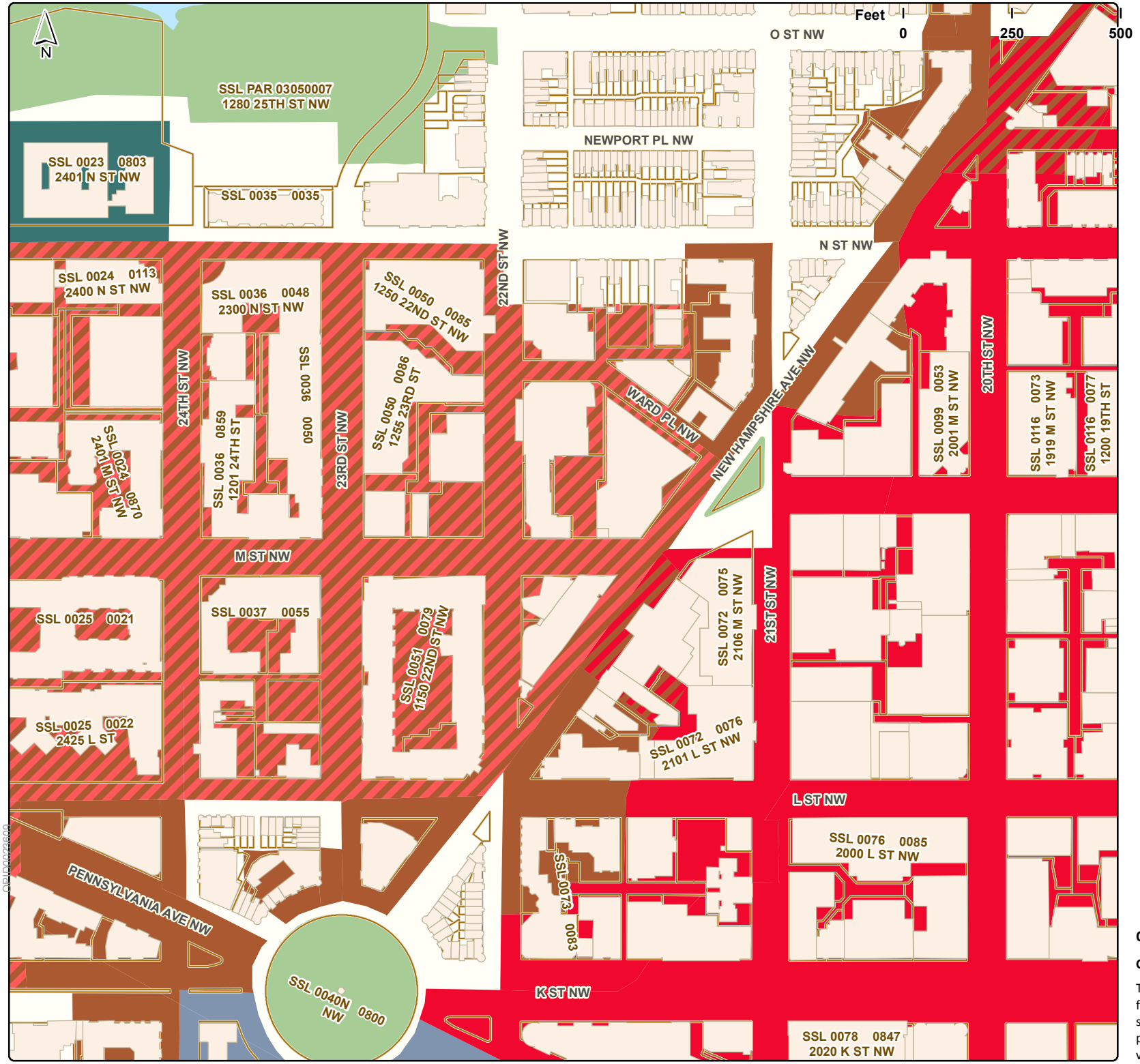
Appendix A. Study Area Maps



22nd & M Sts NW
Height Study

OPID0023609

Office of Planning ~ August 14, 2013

Government of the District of Columbia

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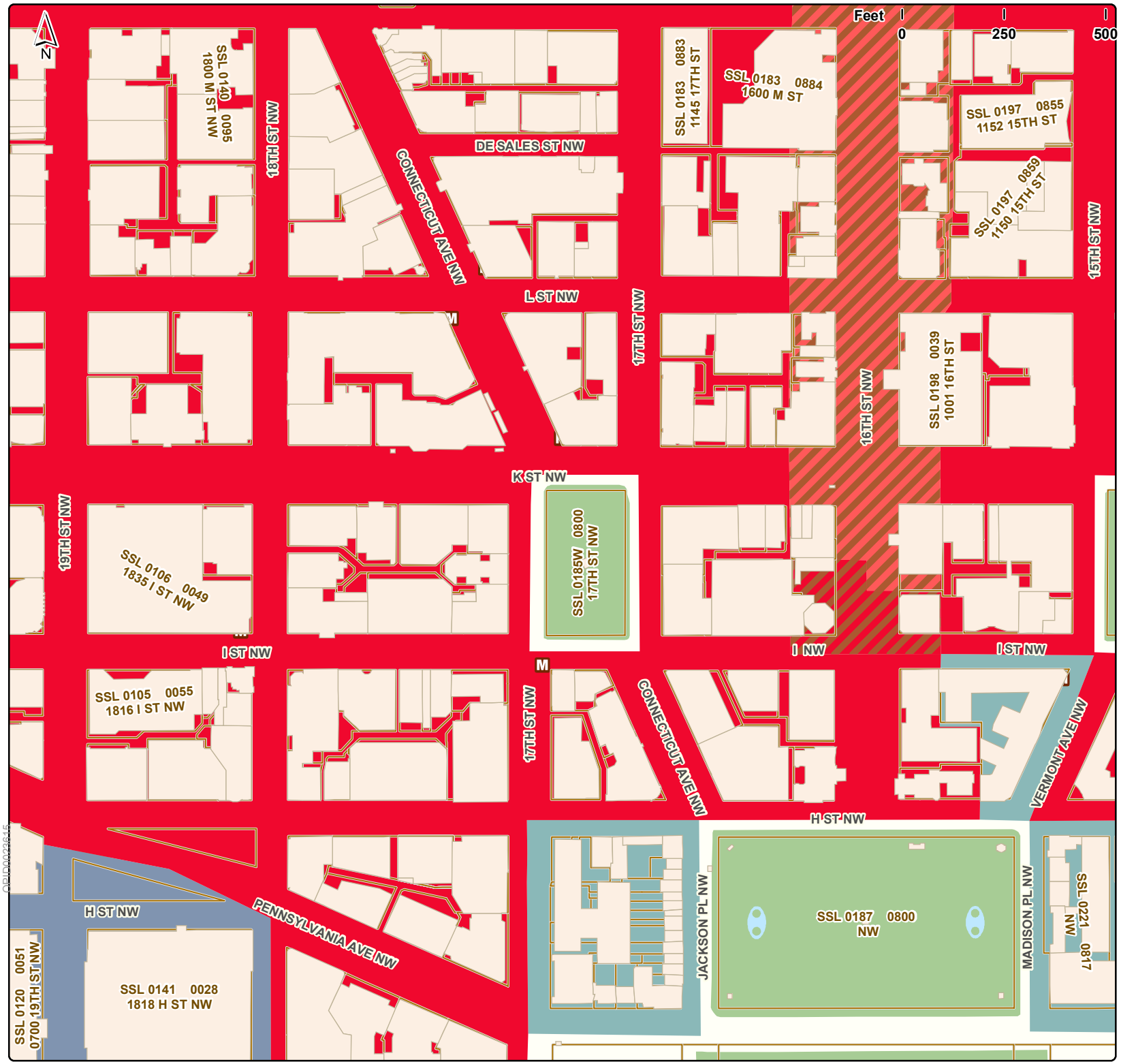

17th & K Sts NW
Height Study

Office of Planning ~ August 14, 2013

Government of the District of Columbia

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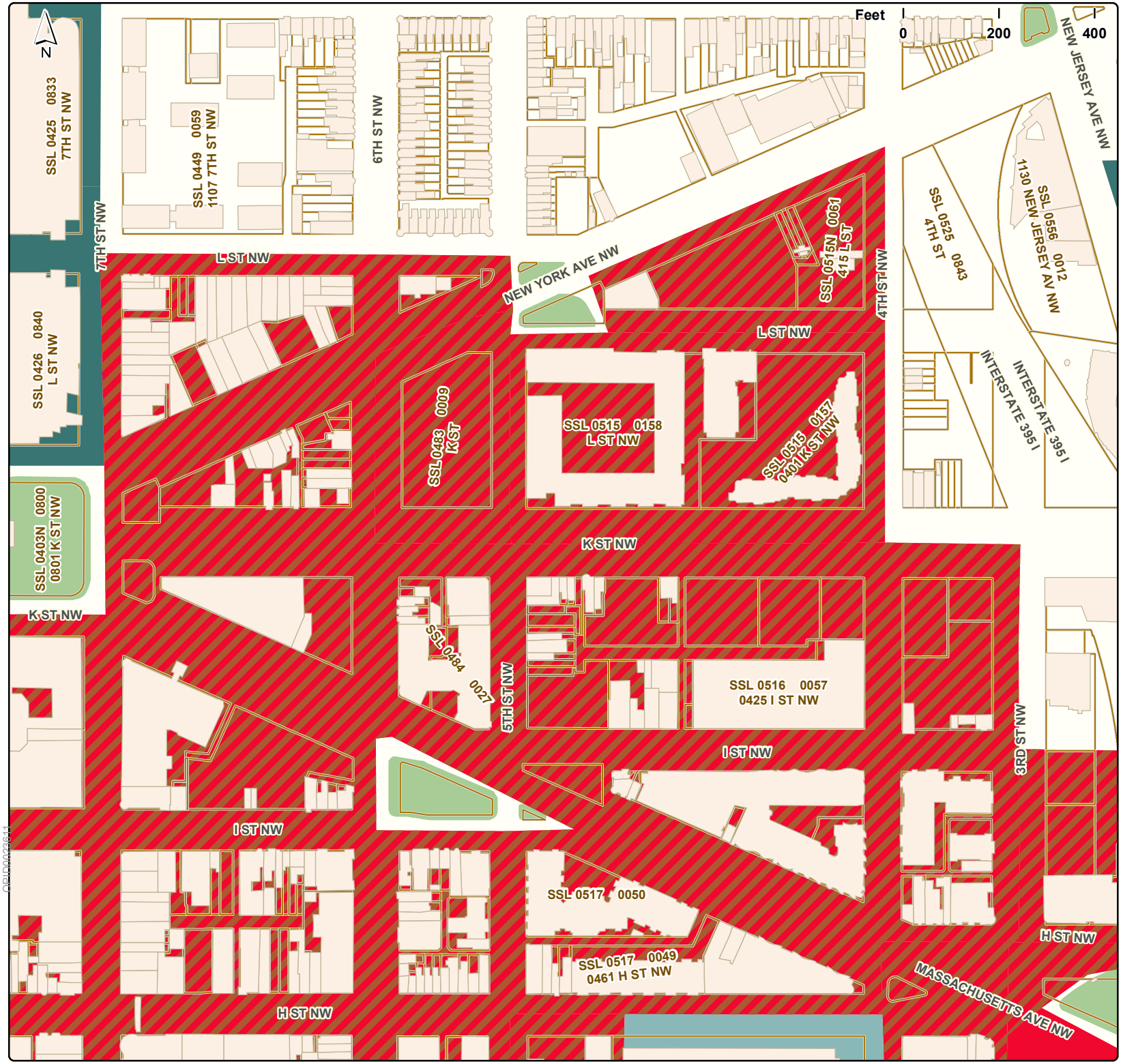

5th & K Sts NW
Height Study

Buildings
Owner Polygons
Metro Station

CHD, RHD
CHD
RHD
LPUB
INST
FED

Office of Planning ~ August 14, 2013

Government of the District of Columbia

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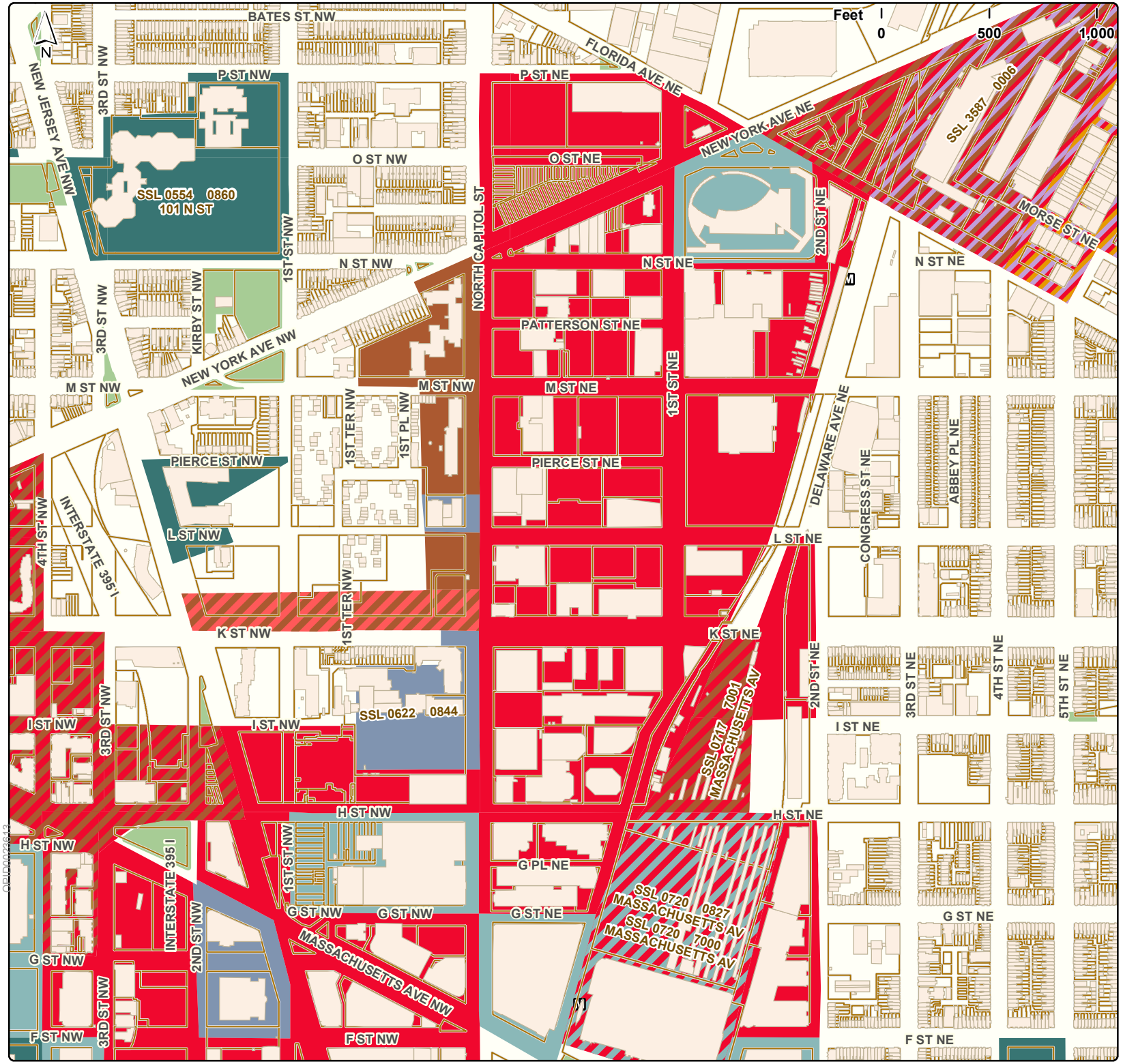

NOMA
Height Study

Office of Planning ~ August 14, 2013

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Office of Planning ~ February 4, 2013

Government of the District of Columbia

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M Metro Station

Owner Polygons

Buildings

CHD

CHD, RHD

CMED, RHD, PROTECH

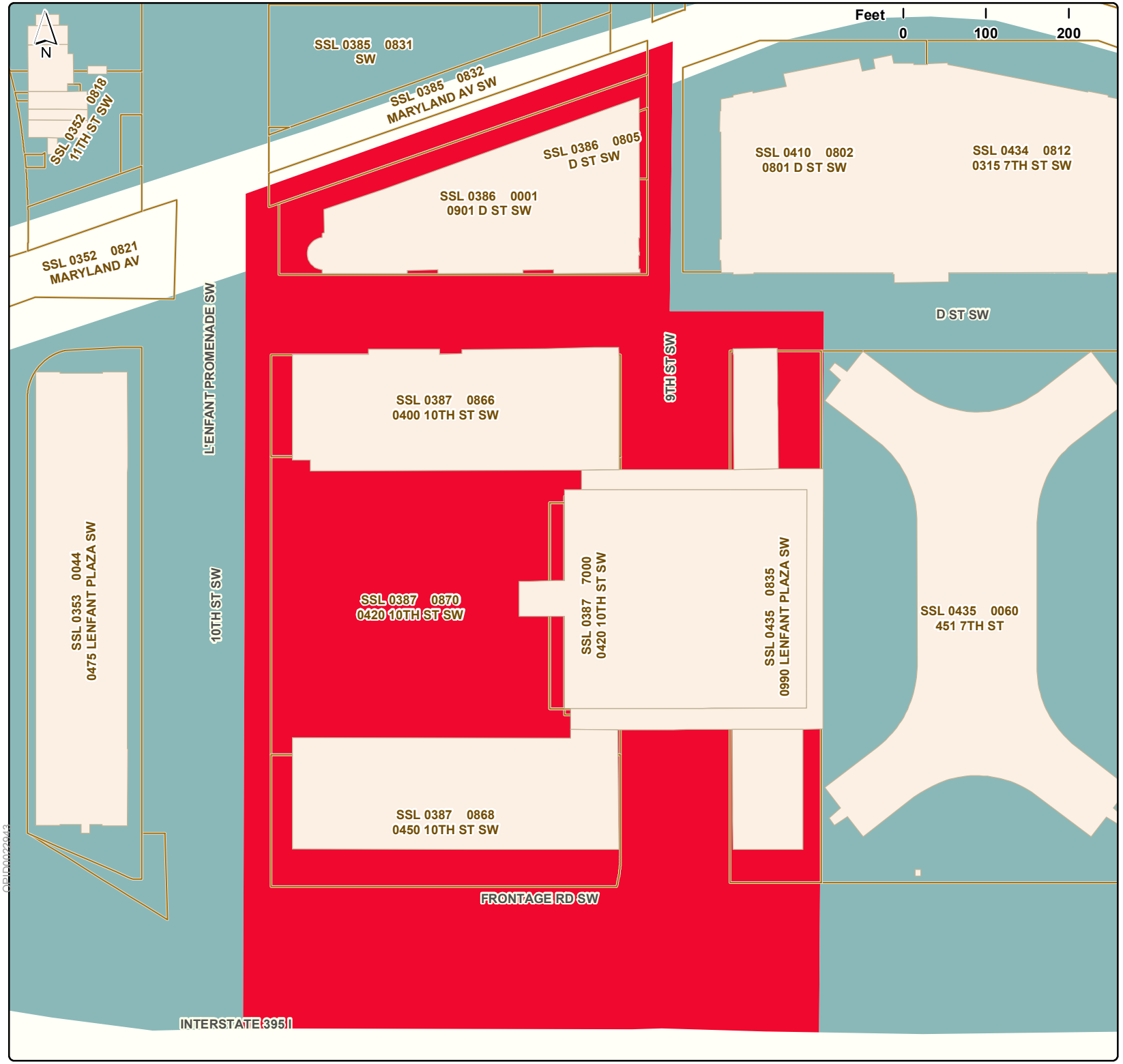
FED

LPUB

INST

Florida Market

Height Study



L'Enfant Metro

Height Study

Metro Station

Owner Polygons

Buildings

CHD

FED

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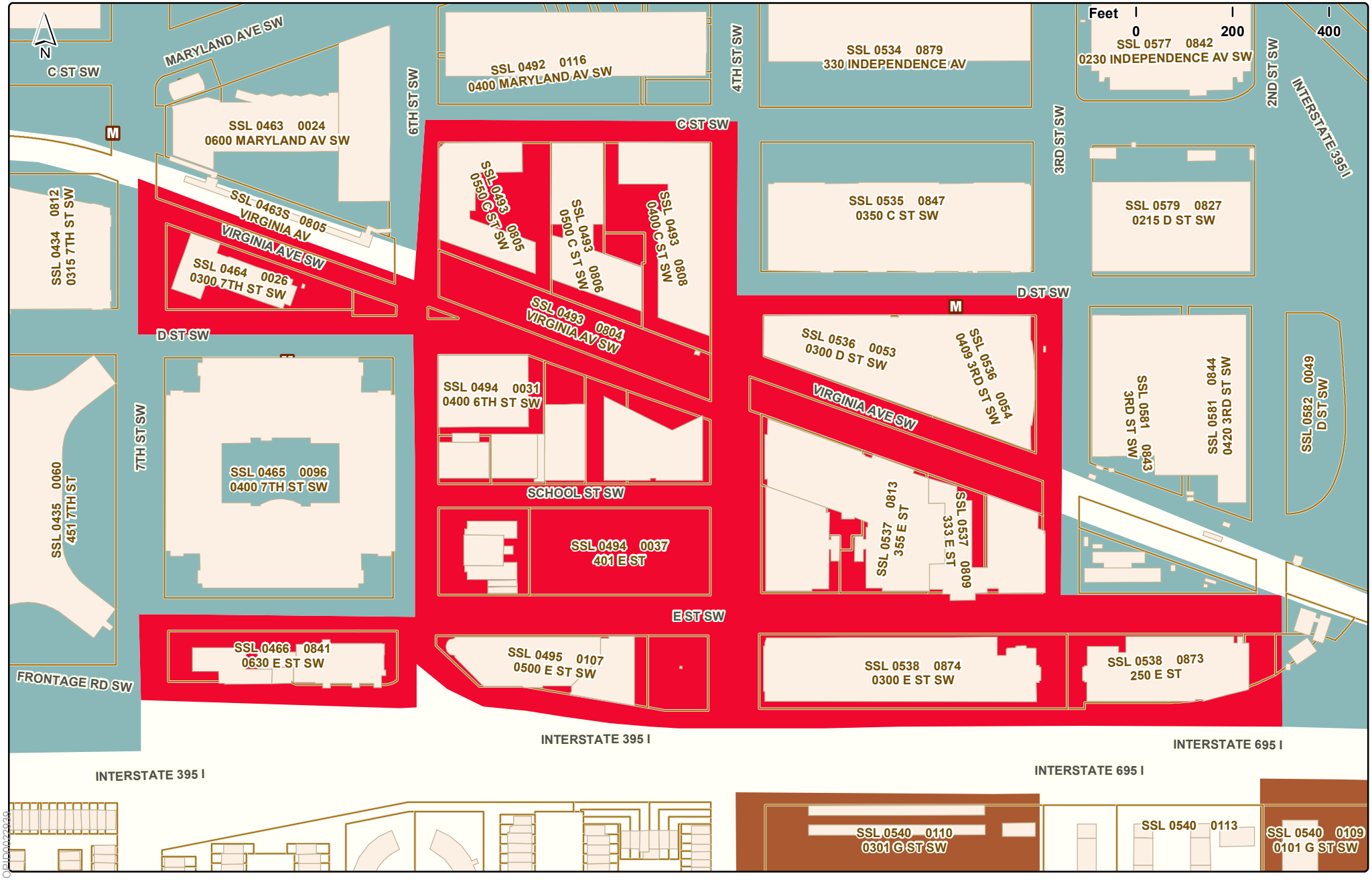

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Government of the District of Columbia

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- Metro Station
- Owner Polygons
- Buildings
- CHD
- RHD
- FED

Federal Center SW

Height Study

Waterfront Metro
Height Study

Metro Station

Owner Polygons

Buildings

CHD, RHD

RHD

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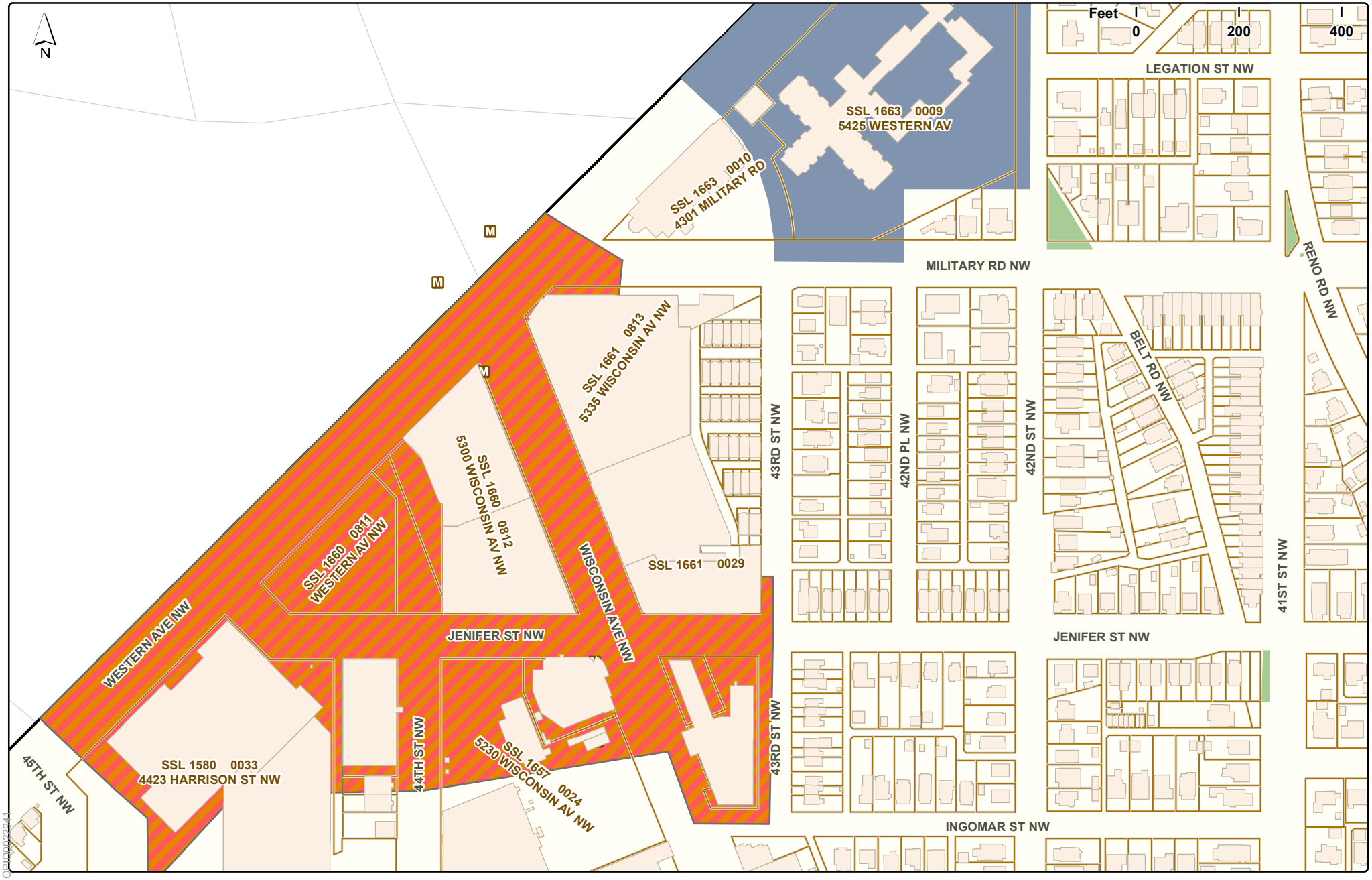

Friendship Heights Metro
Height Study

Office of Planning ~ February 4, 2013

Government of the District of Columbia

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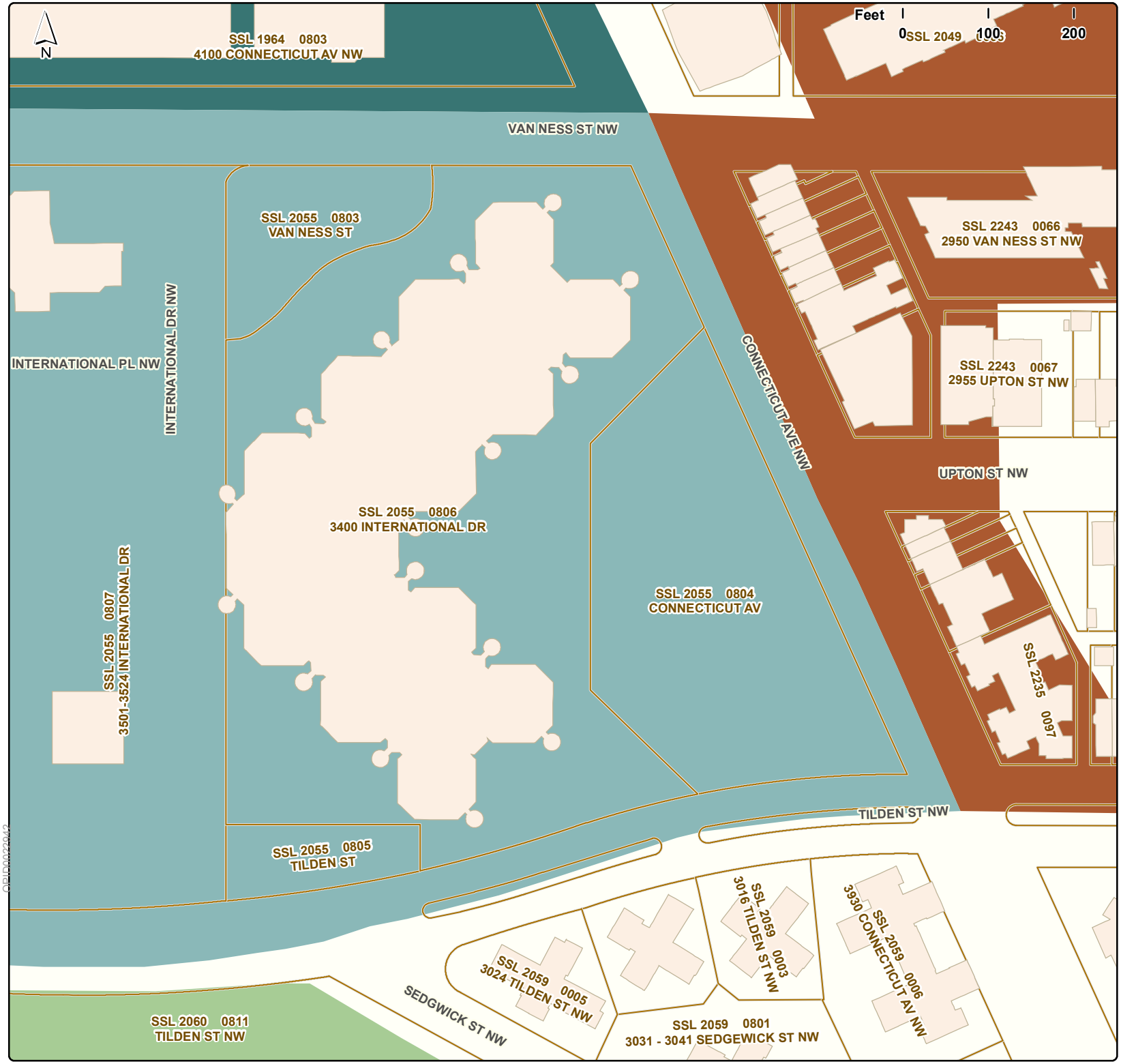
Metro Station
Owner Polygons
Buildings
CMED, RMED
INST



Intelstat Site
Height Study

- Metro Station
- Owner Polygons
- Buildings

- RHD
- FED
- LPUB

Office of Planning ~ February 4, 2013

Government of the District of Columbia

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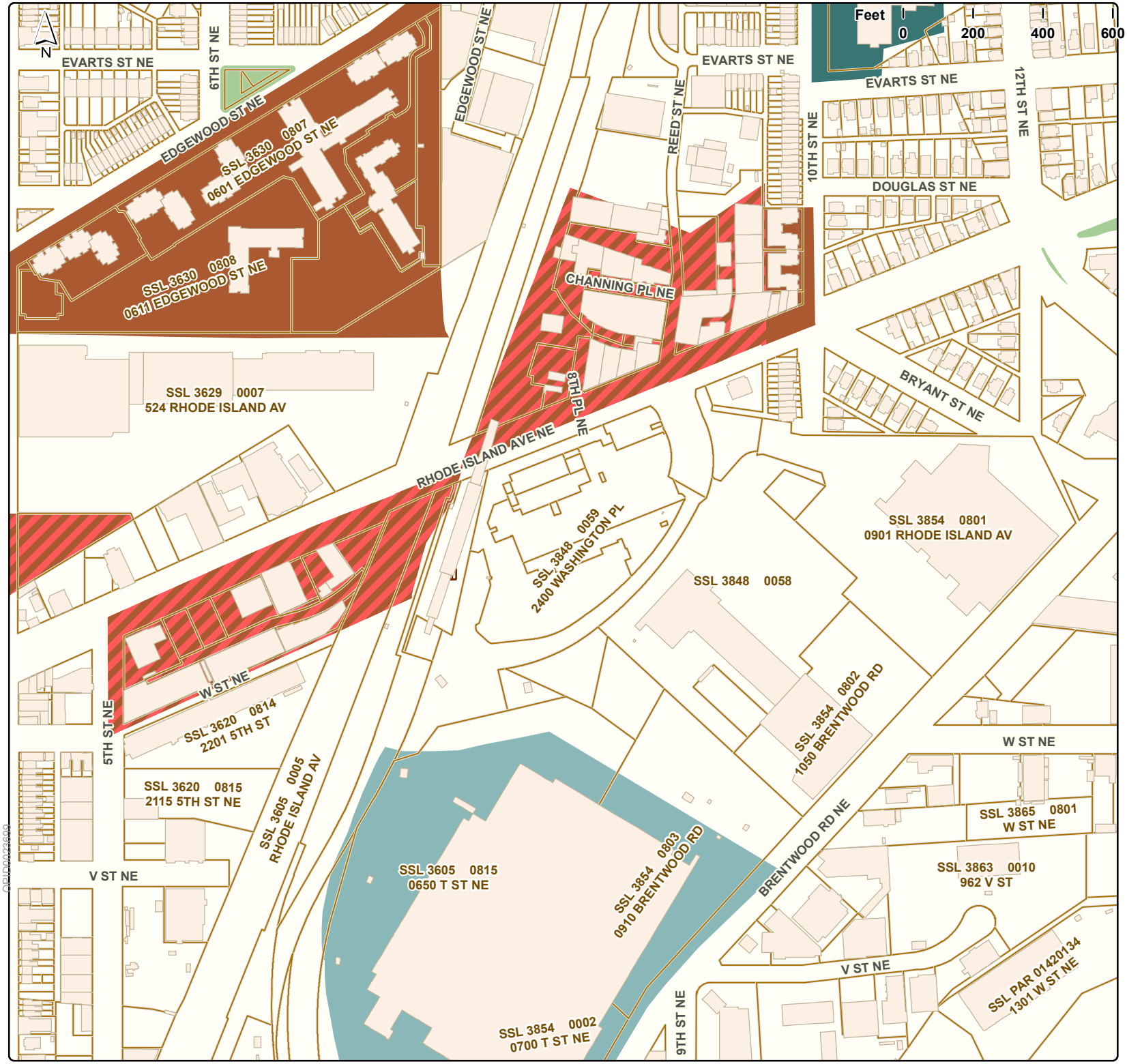

Rhode Island Ave. Metro
Height Study

- Metro Station
- Owner Polygons
- Buildings

- CMED, RHD
- RHD
- FED
- LPUB

Office of Planning ~ September 16, 2013

Government of the District of Columbia

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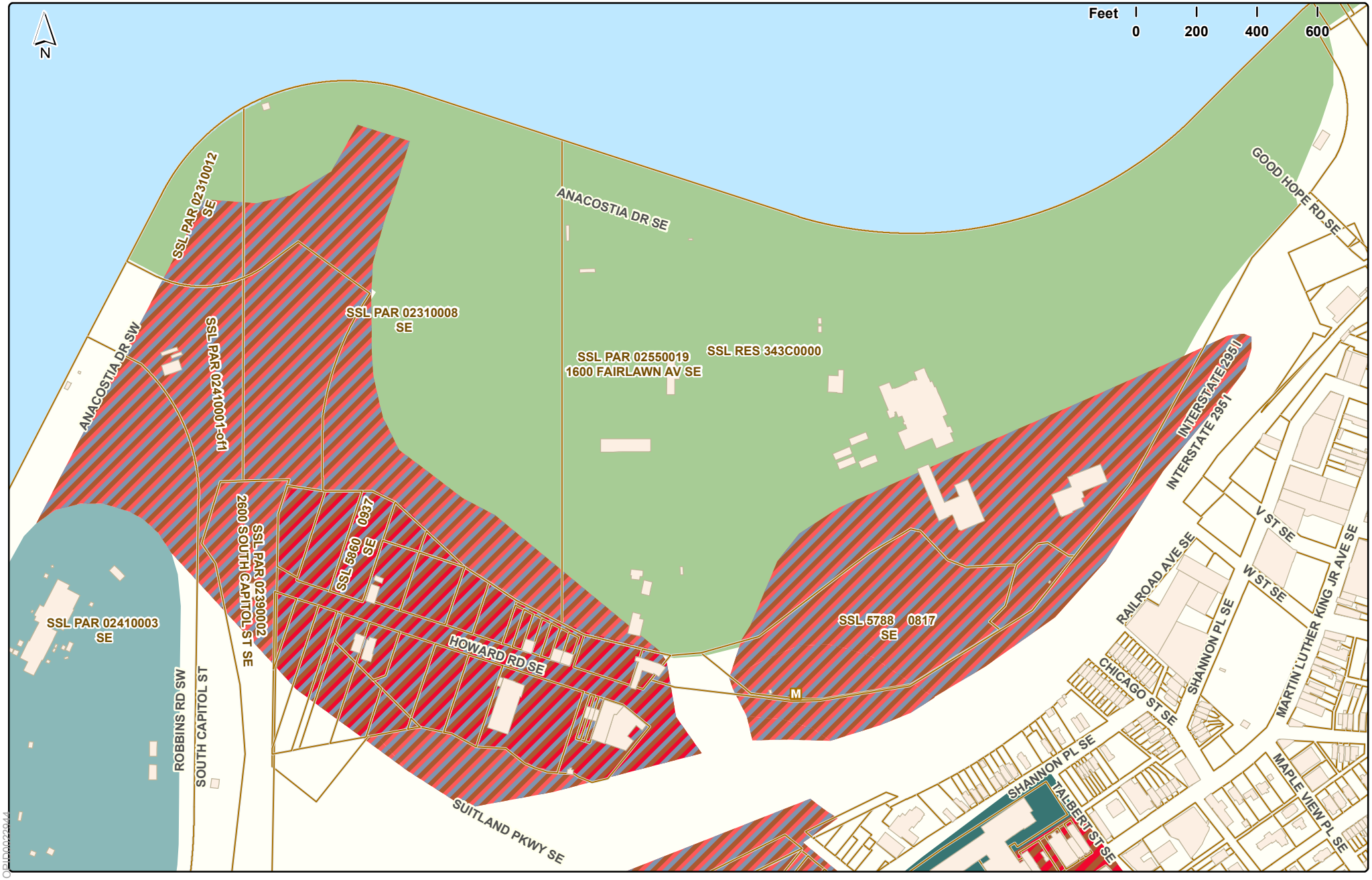

Office of Planning ~ February 4, 2013

Government of the District of Columbia

This map was created for planning purposes from a variety of sources. It is neither a survey nor a legal document. Information provided by other agencies should be verified with them where appropriate.

- M Metro Station
- Owner Polygons
- Buildings
- CHD, INST, RHD
- CMED, INST, RHD
- CHD, RHD
- LPUB

Poplar Point
Height Study

Office of Planning ~ February 4, 2013

Government of the District of Columbia

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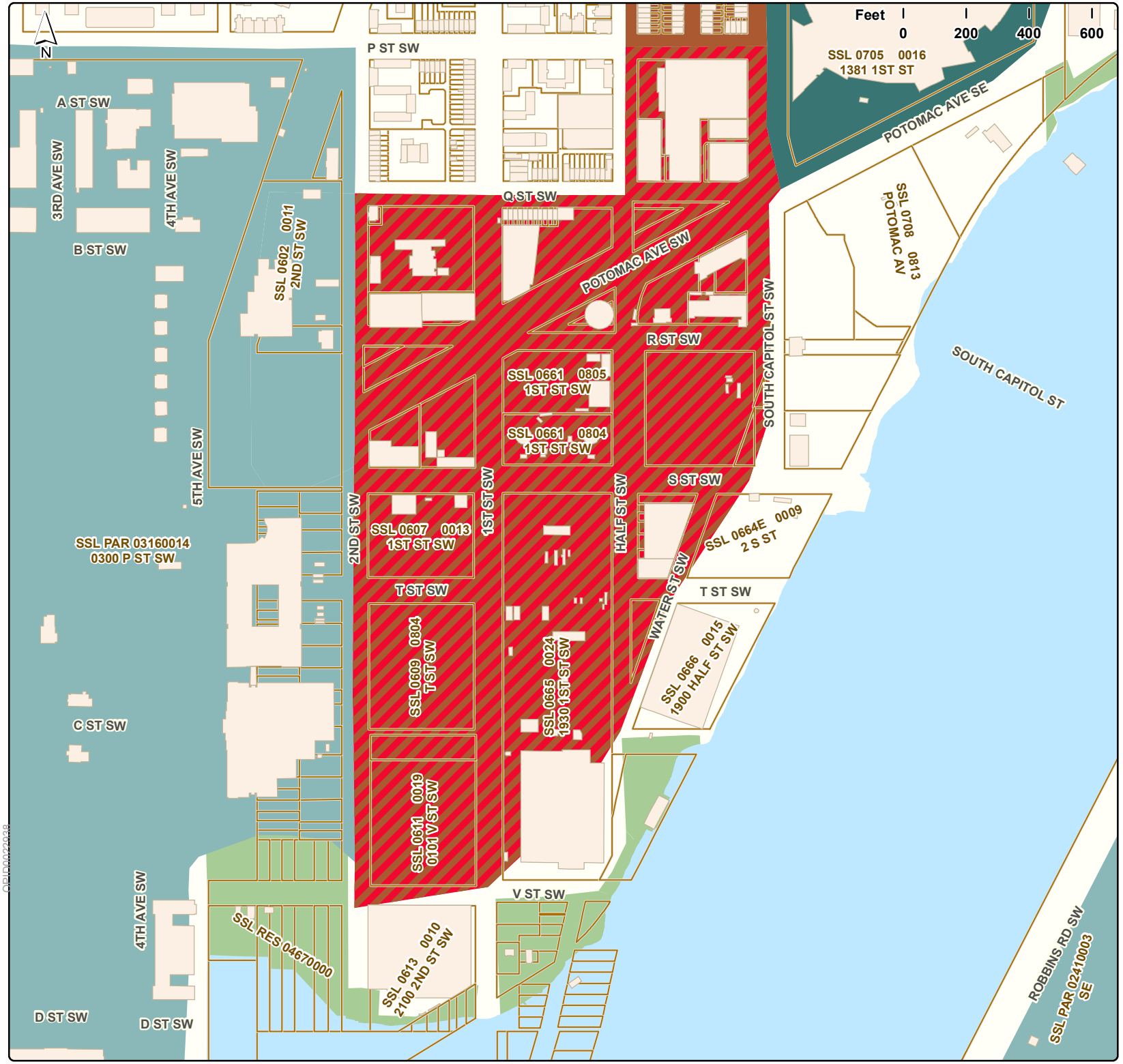
- Metro Station
- Buildings
- Owner Polygons
- CMED, RMED
- LPUB

Congress Heights
Height Study



Buzzards Point
Height Study

- Metro Station
- Owner Polygons
- Buildings
- CHD, RHD
- FED
- LPUB

Office of Planning ~ February 4, 2013

Government of the District of Columbia

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OPJD0023703

Soldiers Home & Clover Leaf
Height Study

Office of Planning ~ September 17, 2013

Government of the District of Columbia

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Buildings
Owner Polygons
FED
INST

PES
Partners for
Economic Solutions

Appendix B. Construction Cost Analysis

ECONOMIC FEASIBILITY ANALYSIS OF THE HEIGHT MASTER PLAN – CONSTRUCTION COSTS

Prepared For:
Partners for Economic Solutions

Prepared By:

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May, 2013

structura
an engineering collaborative

DAVIS

TABLE OF CONTENTS

1.0 – Project Summary

The District of Columbia Office of Planning (DCOP) and the National Capital Planning Commission (NCPC) are conducting studies in selected areas of Washington, DC to assist the federal government and its partners in determining the potential impact of amending the Height of Buildings Act of 1910. Partners for Economic Solutions (PES) has been retained to perform an economic analysis based on parameters established by DCOP and NCPC. Structura, Inc. and James G. Davis Construction will be supporting PES by outlining building construction costs and the key factors influencing construction costs based on the outlined parameters.

2.0 – Factors Influencing Construction Costs

2.1 – Building Heights

Generally, the current building height limit is a function of the street width and zoning ordinances. The taller buildings in DC range in height from 100 to 130 feet above grade. The primary variable of this study is building height. This report shall outline construction costs for variable heights. The study will focus on the following building heights: 130 feet, 160 feet, 200 feet and 250 feet.

2.2 – Location

Another parameter is location. Although there are several factors affecting the cost of a building that are driven by location such as parking, site logistics, soils conditions, utility infrastructure, proximity to WMATA structures, etc., the building cost is generally not influenced directly by the location, and therefore, for the purposes of this report, location is not a variable.

2.3 – Building Uses

A third parameter is building type, or use. This study will focus on renovations and new construction of commercial and residential buildings. Renovations, for purposes of this report, are vertical expansion of existing buildings at or near the current building height limit.

2.4 – Additions to Existing Buildings

Revisions to the existing zoning laws allowing an increase in building height and density will likely result in building owners and developers rethinking their strategies for both new and existing buildings. New construction will be addressed in the next section. This section addresses the factors affecting vertical expansion of existing commercial and residential buildings in the District of Columbia.

One of the main factors influencing cost for vertical expansion of existing buildings is the enhancements necessary to the existing structural system. Enhancements necessary to accommodate vertical expansion are typically twofold. Additional levels of dead load (floor construction) and live loads (occupant loads) must be supported by the existing building columns which are normally not designed and constructed for these additional gravity loads. Vertical expansion also increases the lateral loads (wind and earthquake) on the building structure which needs to be resisted by the building's primary lateral load resisting system. The cost of the necessary enhancements varies widely with the type of building structure and capacities of existing structural elements.

Likely candidates for cost effective vertical expansion with respect to the building structure are as follows:

- Industrial type buildings designed and constructed for manufacturing or storage. These buildings are typically robust concrete structures designed for live loads as much as five times the design live load of commercial or residential buildings, and therefore, by default, changing the use provides significant reserve column and foundation capacities.
- Commercial buildings of eight to ten stories constructed prior to 2000. Most of the buildings falling into this category are concrete buildings designed and constructed originally for live loads in excess of the minimum design loads outlined in the building codes. The DC market drives the design live load. Typically design live loads vary from 80 psf to 100 psf – greater than that required by code. Relatively recent changes to the building code have resulted

in what amounts to a “reduction in safety factors”. Additionally, in-situ testing of the materials can result in actual material strengths in excess of those utilized for design. It is not uncommon for in place concrete strength test values to be 125% of that specified. A combination of these factors may justify reserve column capacities, significantly reducing the costs of necessary enhancements.

Vertical expansion programs vary from a basic expansion, which includes only what is necessary for additional levels, to repositioning the building. A building reposition strategy may include “gutting” the building and providing new building systems, upgrading and/or reconfiguring the building core and restrooms, upgrading and/or reconfiguring the building lobby and/or providing a new building façade.

Other factors influencing the cost of vertical expansion are as follows:

- ***Building Systems*** - Systems such as mechanical, electrical, plumbing, fire protection and/or storm water management will certainly need to be upgraded to accommodate the additional space; however, upgrades to the global incoming or outgoing services can be very significant.
- ***Utility infrastructure*** – Utility upgrades when required may be very costly due to the existing utility capacities. This will be discussed further in Section 3.
- ***Is the building occupied or vacant during construction?*** – Construction operations with the building occupied add significant costs to all building renovations. This is especially true when expanding vertically. The normal issues of building and occupant protection are compounded as tenants and construction personnel both require vertical circulation. Building system components mounted on the roof create logistical issues often requiring temporary systems.

Estimated construction costs will be discussed in the next section; however, it should be noted in this section that while increasing the density of existing buildings by way of vertical expansion may be economically feasible when considering the addition of one to

three levels, beyond that, the costs rise very significantly due to the required enhancements to the building structure.

2.5 – New Construction

Increases in allowable building heights will not drastically change the design approach to commercial or residential projects in DC. The variables which influence construction costs for buildings significantly taller than existing limits will not be greatly impacted either. The building components that will increase on a unit cost basis with heights above 130 feet are as follows:

- ***Structure*** – Although floor systems are not impacted by greater heights, columns, foundations and lateral resisting systems must be more robust.
- ***Elevators*** – Taller buildings necessitate faster travel speeds to maintain acceptable wait times.
- ***Building façade*** – Increased wind loads at higher elevations necessitate stiffer supporting elements and more robust connections; taller buildings complicate access for installation.
- ***Building Systems*** – Longer runs often require intermediate levels to accommodate sub-components; seismic and wind loads result in larger building displacements which require more flexible, and therefore, more expensive connections.
- ***General*** – Taller buildings result in higher costs due to greater travel distances for materials and personnel.

3.0 – Discussion

A Stakeholder's Roundtable Discussion was conducted on April 3, 2013 with members of the development community, DCOP, NCPC and our team relative to the study. Several key discussions ensued regarding the potential short and long term impact of building height relief. Although, Floor Area Ratio (FAR) is linked directly to the height restrictions and is a key discussion point relative to increased density by way of increased building height, for purposes of this exercise, influence of FAR is beyond the scope of this exercise.

Regardless of future relief in building height restrictions, the market will drive the developer's response. A large increase in allowable building height in areas of DC, may not necessarily result in substantially taller buildings immediately. In the case of residential development, the number of units in a particular development or area is limited by market conditions. In the case of commercial development, the larger corporate tenants needed to substantiate larger building areas (federal government excluded) generally target the surrounding suburban markets. Substantially taller single use buildings will require a change in the market conditions – i.e., greater demand. A more reasonable progression may be towards mixed-use buildings.

An easing of height restrictions may, however, result in more cost-effective building construction values. In the real estate community, DC has been dubbed a "concrete town" for a good reason. Due to the current height restrictions, developers maximize the available FAR and their Return on Investment (ROI) by developing buildings with very "thin" floor systems. Traditionally, these floor systems are two-way concrete systems with thicknesses on the order of 7" – 9 ". Comparable structural steel systems for a particular set of parameters (such as span and loading criteria) are on the order of 20" – 24" in depth. Although the steel system is not uniform depth and various elements within the floor/celling sandwich may be located between the deeper members of the system, the floor-to-floor heights for steel buildings are significantly larger than concrete systems given the same parameters, predominantly ceiling heights.

The market conditions in the commercial sector have evolved over the last decade or so in two areas that have further "squeezed" building development. Ceiling heights for Class A office buildings have increased to nine feet and market conditions are driving "column free" zones between the glass lines and the core. The resulting longer spans have exacerbated the challenge to maximize FAR and ROI within the present building restrictions as the depth of structural systems to achieve these spans is greater. Therefore, recent commercial buildings have been designed and constructed with relatively inefficient structural systems to achieve the program. The mechanical systems have been "squeezed" as well. Since performance of the mechanical systems are becoming increasingly more demanding due to changes in the codes and the depths are being reduced to fit into the already tight ceiling plenum, the cost of current mechanical systems are as much as twice the cost of systems in the recent past.

With virtually no change in FAR, combined with a modest increase in height, developers would be able to incorporate more cost effective structural and mechanical systems in their commercial buildings while conforming to the current market conditions. In general, structural steel would become a viable option for office buildings as structural steel buildings are inherently more cost effective – government buildings with protective design requirements excluded.

Another key discussion point was parking. Although, parking requirements may reduce in the future as part of a comprehensive plan to increase density and reduce traffic, in the case of commercial development, developers will be reluctant to deliver office buildings with lower parking ratios. In the event that building areas increase substantially, delivering the same parking ratios below grade will become more difficult due to subgrade conditions (ground water and rock). Above grade parking may be the most cost effective solution.

4.0 – Construction Costs

Included herein is a Cost Summary organized by building type and use. All presented construction cost data is in dollars per square feet. The overall building costs are divided into three components: sitework, below grade garage and building. All values are unit costs derived by dividing the construction costs for each component by the area of the building.

Below the building cost data are the construction values (unit costs derived as described above) for the variables as discussed.

Following the Cost Summary is back-up data, which is cost data for specific buildings in each category broken down in a similar fashion.

DCOP Building Height Feasibillity Analysis

Date: 05/21/2013 **By: CMG**

COST SUMMARY

	OFFICE RENOVATION w/ VERTICAL EXPANSION				OFFICE - NEW CONSTRUCTION				RESIDENTIAL - NEW CONSTRUCTION			
DESCRIPTION	130 Ft.	160 Ft.	200 Ft.	250 Ft.	130 Ft.	160 Ft.	200 Ft.	250 Ft.	130 Ft.	160 Ft.	200 Ft.	250 Ft.
	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.	COST / OFFICE SQ. FT.
SITEWORK (Based on Bldg Sq. Ft.)	$6.00	$4.00			$10.00	$8.00	$6.30	$5.00	$12.00	$9.60	$7.60	$6.00
3 LVL BELOW GRADE GARAGE	$9.00	$15.00			$32.00	$30.00	$24.00	$20.00	$32.00	$30.00	$24.00	$20.00
3 LVL ABOVE GRADE GAREGE	N/A	N/A			N/A	$25.00	$19.00	$14.00	N/A	$25.00	$19.00	$14.00
BUILDING (OFFICE / RESIDENTIAL)	$135.00	$140.00			$140.00	$150.00	$160.00	$160.00	$155.00	$165.00	$175.00	$175.00
SUBTOTAL	**$150.00**	**$159.00**			**$182.00**	**$213.00**	**$209.30**	**$199.00**	**$199.00**	**$229.60**	**$225.60**	**$215.00**
VARIABLES												
DEMOLITION	$1.50	$0.90			$10.00	$8.00	$7.00	$6.00	$10.00	$8.00	$7.00	$6.00
DEEP FOUNDATIONS REQ'D	INCLUDED	$4.50			$2.70	$2.50	$2.30	$2.20	$2.70	$2.50	$2.30	$2.20
ADJACENT PROPERTIES	$0.00	$0.00			$0.80	$0.75	$0.70	$0.64	$0.80	$0.75	$0.70	$0.64
HIGH WATER TABLE	N/A	N/A			$0.40	$0.37	$0.34	$0.32	$0.40	$0.37	$0.34	$0.32
UTILITY INFRASTRUCTURE UPGRADES	$1.50	$1.00			$0.51	$0.46	$0.40	$0.37	$0.54	$0.50	$0.46	$0.44
SITE LOGISTICAL CHALLENGES	$0.50	$0.35			$0.19	$0.17	$0.15	$0.13	$0.20	$0.19	$0.17	$0.17
ADJACENT TO METRO TUNNEL	N/A	N/A			$0.75	$0.66	$0.57	$0.53	$0.75	$0.66	$0.57	$0.53
EXTENSIVE SITE / PLAZA SPACE	$5.00	$4.50			$5.00	$4.50	$4.00	$3.50	$5.00	$4.50	$4.00	$3.50
CORE REPOSITIONING	$6.00	$4.00			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FAÇADE REPLACEMENT OF EXISTING BLDG	INCLUDED	INCLUDED			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OCCUPIED RENOVATION	INCLUDED	INCLUDED			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CORE STIFFENING / STRENGTHENING	INCLUDED	$20.00										
TOTAL PROJECT COST/BLDG SQ FT	**$164.50**	**$194.25**	**Not Analyzed**	**Not Analyzed**	**$202.36**	**$230.41**	**$224.76**	**$212.69**	**$219.40**	**$247.07**	**$241.15**	**$228.80**

Cost Comparison of Urban Office Buildings w/ Underground Parking

Date: 2/28/2013 **By: CMG**

	PROJECT A		PROJECT B		PROJECT C		PROJECT D	
COST SUMMARY								
DESCRIPTION	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF
SITEWORK	$3,688,554	$8.47	$1,383,543	$3.62	$2,133,581	$3.87	$7,833,745	$10.49
BELOW GRADE GARAGE	$19,115,685	$43.87	$0	$0.00	$36,265,215	$65.78	$30,419,055	$40.75
ABOVE GRADE GARAGE	N/A	N/A	N/A	N/A	$9,957,455	$83.18	N/A	N/A
OFFICE	$53,519,323	$122.84	$60,807,036	$159.51	$70,321,913	$127.56	$120,680,982	$161.66
TOTAL PROJECT COSTS	**$76,323,562**	**$114.03**	**$62,190,579**	**$163.14**	**$118,678,163**	**$90.85**	**$158,933,782**	**$151.92**
Number of Stories:	20		16		20 w/ 2 levels of above grade pkg		24	
Building Height (Ft):	269.00		200.00		320.00		300.00	
Garage Area (Sf):	233,600		0		755,078		299,679	
Building Area (Sf):	435,700		382,000		551,286		746,500	
Date:	1-Feb-13		18-Jan-13		28-Oct-11		10-Sep-12	
Pricing Type:	DD Budget		DD Budget		50% CD Budget		SD Budget	

Cost Comparison of Urban Residential Buildings w/ Underground Parking

Date: 2/28/2013 **By: CMG**

	PROJECT A		PROJECT B		PROJECT C		PROJECT D	
COST SUMMARY								
DESCRIPTION	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF
SITEWORK	$2,068,739	$5.29	$0	N/A	$1,928,003	$3.85	$4,276,866	$11.56
BELOW GRADE GARAGE	$7,378,277	$18.86	$0	$0.00	$20,475,415	$40.85	$16,570,537	$44.81
ABOVE GRADE GARAGE	N/A	N/A	N/A	N/A	$6,483,218	$57.88	N/A	N/A
RESIDENTIAL	$60,542,948	$154.79	$93,040,624	$178.85	$87,558,115	$174.69	$56,796,877	$153.58
TOTAL PROJECT COSTS	**$69,989,964**	**$178.95**	**$93,040,624**	**$178.85**	**$116,444,751**	**$232.32**	**$77,644,280**	**$209.95**
Number of Stories:	22		23		31		14	
Building Height (Ft):	200.00		205.00		351.00		130.00	
Garage Area (Sf):	89,943		0		430,392		178,367	
Building Area (Sf):	391,125		520,230		501,217		369,820	
Date:	20-May-10		13-Sep-12		7-Nov-11		12-Apr-12	
Pricing Type:	Bid		GMP		Budget		GMP	

Cost Comparison of Urban Renovation Projects

Date: 2/28/2013 **By: CMG**

	PROJECT A		PROJECT B		PROJECT C		PROJECT D	
COST SUMMARY								
DESCRIPTION	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF
SITEWORK	$765,226	$5.17	$4,861,966	$16.29		N/A	$860,344	$5.90
BELOW GRADE GARAGE	$167,640	$1.13	$1,626,344	$5.45		$0.00	$969,613	$6.65
ABOVE GRADE	$13,189,564	$89.07	$35,283,890	$118.20		$0.00	$22,785,937	$156.28
TOTAL PROJECT COSTS	**$14,122,430**	**$95.37**	**$41,772,201**	**$139.94**	**$0**	**$0.00**	**$24,615,894**	**$168.83**
Number of Stories:	8 Exisiting + 3 New & PH		9 Existing + 1 New & PH				8 Existing + 2 New & PH	
Building Height (Ft):	130.00		130.00				130.00	
Garage Area (Sf):	31,653		72,400				37,900	
Building Area (Sf):	148,076		298,500				145,800	
Date:	9-Aug-07		21-Sep-11				19-Aug-11	
Pricing Type:	DD Budget		GMP				SD Budget	

Cost Comparison of 12-Story Urban Office Buildings w/ Underground Parking

Date: 2/28/2013 **By: CMG**

	PROJECT A		PROJECT B		PROJECT C		PROJECT D	
COST SUMMARY								
DESCRIPTION	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF	TOTAL COST	COST PER SF
SITEWORK	$3,832,914	$4.75	$2,403,340	$4.19	$3,116,301	$11.06	$4,276,192	$16.05
BELOW GRADE GARAGE	$22,056,619	$27.36	$18,316,212	$31.96	$6,161,893	$21.87	$6,546,245	$24.56
OFFICE	$108,705,829	$134.82	$76,950,540	$134.27	$38,656,989	$137.23	$42,606,257	$159.88
TOTAL PROJECT COSTS	**$134,595,362**	**$128.96**	**$97,670,091**	**$132.92**	**$47,935,183**	**$145.30**	**$53,428,694**	**$167.98**
Number of Stories:	12		12		12		13 (includes 1 below grade level)	
Building Height (Ft):	130.00		130.00		130.00		130.00	
Garage Area (Sf):	237,400		161,700		48,200		51,564	
Building Area (Sf):	806,300		573,100		281,700		266,493	
Date:	25-Jan-13		3-Oct-12		14-Jan-13		7-Dec-07	
Pricing Type:	DD Budget		SD Budget		90% Budget		GMP	

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Appendix C. Financial Analysis Tables

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Table C-1. Input Assumptions			
	Commercial	Rental Apartments	
Developer Return	6.5%	7.0%	of total costs
Vacancy and Collection Loss	5%	5%	% of revenues
Site Coverage Ratio	95%	85%	of land sq. ft.
Building Efficiency (Leaseable/Gross S.F.)	90%	85%	percent
Size of Parking Space	400	400	square feet
Residential Parking Spaces (Minimum)	NA	0.5-0.8	per unit
Commercial Parking Spaces	0.4-1.0	NA	per 1,000 g.s.f.
Cost of Sale	NA	NA	of sale price
Development Cost Assumptions			
Infrastructure & Site Improvements			
130 Feet	$10.00	$12.00	per g.s.f.
160 Feet	$8.00	$9.60	per g.s.f.
200 Feet	$6.30	$7.60	per g.s.f.
250 Feet	$5.00	$6.00	per g.s.f.
Renovation - 130 Feet	$6.00	$6.00	per g.s.f.
Renovation - 160 Feet	$4.00	$4.00	per g.s.f.
Demolition of Existing Structures	$8.00	$8.00	per existing g.s.f.
Existing Office FAR to be Demolished	7.6	7.6	per land s.f.
Hard Costs (Including General Conditions)			
130 Feet	$140	$155	per g.s.f.
160 Feet	$150	$165	per g.s.f.
200 Feet	$160	$175	per g.s.f.
250 Feet	$160	$175	per g.s.f.
Total Renovation Hard Costs if Existing Space (Including General Conditions)	$100	$110	per g.s.f.
Hard Costs for Additional Floors			
2 Floors Only	$144	$159	per g.s.f.
4 Floors Only	$175	$190	per g.s.f.
Renovation Sitework			
2 Floors	$6	$6	per g.s.f.
4 Floors	$4	$4	per g.s.f.
Below-Grade Parking Costs (3 Levels)			
130 Feet	$32	$32	per g.s.f.
160 Feet	$30	$30	per g.s.f.
200 Feet	$24	$24	per g.s.f.
250 Feet	$20	$20	per g.s.f.
Soft Costs (Including Const. Financing)	40%	35%	of hard costs
Replacement Reserves	NA	$350	per unit
Property Tax Rate	0.01850	0.00850	

Source: Structura, Inc.; James G. Davis Construction Corporation; Developer Interviews; Partners for Economic Solutions, 2013.

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Table C-2. New Office/Retail Development, Low-Land-Cost Site				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	9.0	12.0	15.0	18.8
Gross Square Feet	196,000	261,000	327,000	409,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.8	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	176,400	234,900	294,300	368,100
Office	170,200	228,700	288,100	361,900
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Required Office Rent (Full Service)	$47.50	$48.50	$48.75	$48.50
Retail Rent (NNN)	$30.00	$30.00	$30.00	$30.00
Monthly Parking Rate	$200	$200	$200	$200
Office Operating Expense per Sq. Ft.	$18.00	$18.00	$18.00	$18.00
Development Costs				
Land Acquisition	$3,920,000	$5,227,000	$6,534,000	$8,189,000
Construction Costs	$27,440,000	$39,150,000	$52,320,000	$65,440,000
Site Improvement/Infrastructure Costs	$1,960,000	$2,088,000	$2,060,000	$2,045,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$6,272,000	$7,830,000	$7,848,000	$8,180,000
Soft Costs	$16,648,000	$22,676,000	$28,598,000	$34,645,000
Office Tenant Improvement Costs	$15,318,000	$20,583,000	$25,929,000	$32,571,000
Retail Tenant Improvement Costs	$589,000	$589,000	$589,000	$589,000
Total Development Costs	**$73,471,000**	**$99,467,000**	**$125,202,000**	**$152,983,000**
Total Development Costs/Rentable Sq. Ft.	*$417*	*$423*	*$425*	*$416*
Development Feasibility				
Gross Rent (100% Occupancy)	$8,659,000	$11,667,000	$14,620,000	$18,127,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$8,226,100**	**$11,083,700**	**$13,889,000**	**$17,220,700**
Operating Expenses	$3,064,000	$4,117,000	$5,186,000	$6,514,000
Net Operating Income	**$5,162,100**	**$6,966,700**	**$8,703,000**	**$10,706,700**
Return on Investment (Cash-on-Cash)	**7.0%**	**7.0%**	**7.0%**	**7.0%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-3. New Apartment Development, Low-Land-Cost Site							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	75%				75%	75%	75%
Future FAR	9.0				12.0	15.0	18.8
Future Project Density (DU/AC)	363				495	626	791
Base Project Size (Units)	181				247	313	395
Market-Rate Units	166				227	287	363
Affordable Units	15				20	26	32
Parking Ratio (Spaces per Unit)	0.6				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	160,500				218,700	276,900	349,700
First-Floor Space Rented	4,900				4,900	4,900	4,900
Common Area	34,100				44,400	54,600	67,500
Total Gross Square Feet	194,600				263,100	331,500	417,200
Average Unit Size (Square Feet)	887				885	885	885
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Required Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	26	$1,665	35	44	50
1 BR	775	45%	74	$2,255	102	129	166
2 BR	1,150	38%	63	$3,170	86	109	140
3 BR	1,250	2%	3	$3,190	4	5	7
Average Required Monthly Rent	$2,527				$2,614	$2,601	$2,556
Affordable Units							
Efficiency	495	15%	1	$1,393	2	3	9
1 BR	775	45%	7	$1,547	9	12	12
2 BR	1,150	38%	6	$1,717	8	10	10
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,641				$1,627	$1,616	$1,574
Average Monthly Rent	$2,450				$2,450	$2,450	$2,470
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$200				$200	$200	$200
First-Floor Commercial Rent	$30				$30	$30	$30
Operating Expense per Square Foot, Excluding Utilities	$6.50				$6.50	$6.50	$6.50
Development Costs							
Land Acquisition	$3,920,000				$5,227,000	$6,534,000	$8,189,000
Construction Costs	$30,163,000				$43,412,000	$58,013,000	$73,010,000
Site Improvement/Infrastructure Costs	$2,335,000				$2,526,000	$2,519,000	$2,503,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$6,227,000				$7,893,000	$7,956,000	$8,344,000
Soft Costs	$18,022,000				$24,820,000	$31,415,000	$38,331,000
Commercial Tenant Improv. Costs	$466,000				$466,000	$466,000	$466,000
Total Development Costs	**$62,457,000**				**$85,668,000**	**$108,227,000**	**$132,167,000**
Total Development Costs/Unit	*$345,100*				*$346,800*	*$345,800*	*$334,600*
Development Feasibility							
Gross Rent (100% Occupancy)	$5,734,800				$7,918,600	$10,004,400	$12,287,900
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$5,448,100**				**$7,522,700**	**$9,504,200**	**$11,673,500**
Operating Expenses	$1,043,000				$1,422,000	$1,800,000	$2,273,000
Replacement Reserves	$63,000				$86,000	$110,000	$138,000
Net Operating Income	**$4,342,100**				**$6,014,700**	**$7,594,200**	**$9,262,500**
Return on Investment (Cash-on-Cash)	**7.0%**				**7.0%**	**7.0%**	**7.0%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-4. Conversion Factors from Height to Stories and Floor Area Ratio						
	Stories		FAR		Density in Units per Acre[5]	
Height in Feet	Commercial[1]	Residential[2]	Commercial[3]	Residential[4]	Apartments[6]	Condos[7]
130	10	12	9.5	10.2	439	374
160	13	15	12.4	12.8	559	476
200	17	19	16.2	16.2	719	612
250	21	24	20.0	20.4	919	782

Notes: [1]Assumes 11.5' slab to slab plus 16' first floor ceiling height.
[2]Assumes 9.7' slab to slab plus 14' first floor ceiling height.
[3]Assumes 95% lot coverage.
[4]Assumes 85% lot coverage.
[5]Assumes first floor for amenity or commercial use.
[6]Assumes an average size of 980 gsf or 835 nsf per unit.
[7]Assumes an average size of 1,150 gsf or 947 nsf per unit.
Sources: Structura, Inc.; Partners for Economic Solutions, 2013.

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Table C-5. New Office/Retail Development, 17th at K Street, NW				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$75.00	$76.00	$77.60	$79.10
Retail Rent (NNN)	$60.00	$60.00	$61.00	$62.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$28.00	$28.00	$28.00	$28.00
Development Costs				
Land Acquisition	$55,539,000	$69,696,000	$88,209,000	$111,078,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$17,424,000	$22,041,000	$28,035,000	$35,406,000
Retail Tenant Improvement Costs	$496,000	$496,000	$496,000	$496,000
Total Development Costs	**$131,878,000**	**$167,519,000**	**$212,640,000**	**$263,830,000**
Total Development Costs/Rentable Sq. Ft.	*$660*	*$667*	*$669*	*$660*
Development Feasibility				
Gross Rent (100% Occupancy)	$15,378,000	$19,470,000	$25,037,000	$31,988,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$14,609,100**	**$18,496,500**	**$23,785,200**	**$30,388,600**
Operating Expenses	$5,421,000	$6,857,000	$8,722,000	$11,015,000
Net Operating Income	**$9,188,100**	**$11,639,500**	**$15,063,200**	**$19,373,600**
Return on Investment (Cash-on-Cash)	**7.0%**	**6.9%**	**7.1%**	**7.3%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-6. New Office/Retail Development, West End, 22nd at M Street, NW				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$60.00	$60.80	$62.10	$63.30
Retail Rent (NNN)	$45.00	$45.00	$46.00	$47.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$21.00	$21.00	$21.00	$21.00
Development Costs				
Land Acquisition	$42,210,000	$52,969,000	$67,039,000	$84,419,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$12,584,000	$15,919,000	$20,248,000	$25,571,000
Retail Tenant Improvement Costs	$403,000	$403,000	$403,000	$403,000
Total Development Costs	**$113,616,000**	**$144,577,000**	**$183,590,000**	**$227,243,000**
Total Development Costs/Rentable Sq. Ft.	*$569*	*$576*	*$578*	*$569*
Development Feasibility				
Gross Rent (100% Occupancy)	$12,381,000	$15,655,000	$20,115,000	$25,680,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$11,762,000**	**$14,872,300**	**$19,109,300**	**$24,396,000**
Operating Expenses	$4,066,000	$5,143,000	$6,542,000	$8,261,000
Net Operating Income	**$7,696,000**	**$9,729,300**	**$12,567,300**	**$16,135,000**
Return on Investment (Cash-on-Cash)	**6.8%**	**6.7%**	**6.8%**	**7.1%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-7. New Office/Retail Development, NoMa				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$50.00	$50.70	$51.80	$52.80
Retail Rent (NNN)	$35.00	$35.00	$36.00	$37.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$17.00	$17.00	$17.00	$17.00
Development Costs				
Land Acquisition	$17,772,000	$22,303,000	$28,227,000	$35,545,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$11,616,000	$14,694,000	$18,690,000	$23,604,000
Retail Tenant Improvement Costs	$434,000	$434,000	$434,000	$434,000
Total Development Costs	**$88,241,000**	**$112,717,000**	**$143,251,000**	**$176,433,000**
Total Development Costs/Rentable Sq. Ft.	*$442*	*$449*	*$451*	*$442*
Development Feasibility				
Gross Rent (100% Occupancy)	$10,383,000	$13,119,000	$16,845,000	$21,487,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$9,863,900**	**$12,463,100**	**$16,002,800**	**$20,412,700**
Operating Expenses	$3,291,000	$4,163,000	$5,296,000	$6,688,000
Net Operating Income	**$6,572,900**	**$8,300,100**	**$10,706,800**	**$13,724,700**
Return on Investment (Cash-on-Cash)	**7.4%**	**7.4%**	**7.5%**	**7.8%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-8. New Office/Retail Development, 5th at K Street, NW				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$40.00	$40.50	$41.40	$42.20
Retail Rent (NNN)	$30.00	$30.00	$31.00	$32.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$15.00	$15.00	$15.00	$15.00
Development Costs				
Land Acquisition	$17,772,000	$22,303,000	$28,227,000	$35,545,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$9,680,000	$12,245,000	$15,575,000	$19,670,000
Retail Tenant Improvement Costs	$403,000	$403,000	$403,000	$403,000
Total Development Costs	**$86,274,000**	**$110,237,000**	**$140,105,000**	**$172,468,000**
Total Development Costs/Rentable Sq. Ft.	*$432*	*$439*	*$441*	*$432*
Development Feasibility				
Gross Rent (100% Occupancy)	$8,416,000	$10,590,000	$13,574,000	$17,286,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$7,995,200**	**$10,060,500**	**$12,895,300**	**$16,421,700**
Operating Expenses	$2,904,000	$3,674,000	$4,673,000	$5,901,000
Net Operating Income	**$5,091,200**	**$6,386,500**	**$8,222,300**	**$10,520,700**
Return on Investment (Cash-on-Cash)	**5.9%**	**5.8%**	**5.9%**	**6.1%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-9. New Office/Retail Development, Florida Avenue Market				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$35.00	$35.50	$36.20	$36.90
Retail Rent (NNN)	$20.00	$20.00	$21.00	$22.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$13.00	$13.00	$13.00	$13.00
Development Costs				
Land Acquisition	$8,886,000	$11,151,000	$14,113,000	$17,772,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$9,680,000	$12,245,000	$15,575,000	$19,670,000
Retail Tenant Improvement Costs	$217,000	$217,000	$217,000	$217,000
Total Development Costs	**$77,202,000**	**$98,899,000**	**$125,805,000**	**$154,509,000**
Total Development Costs/Rentable Sq. Ft.	*$386*	*$394*	*$396*	*$387*
Development Feasibility				
Gross Rent (100% Occupancy)	$7,386,000	$9,304,000	$11,893,000	$15,139,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$7,016,700**	**$8,838,800**	**$11,298,400**	**$14,382,100**
Operating Expenses	$2,517,000	$3,184,000	$4,050,000	$5,114,000
Net Operating Income	**$4,499,700**	**$5,654,800**	**$7,248,400**	**$9,268,100**
Return on Investment (Cash-on-Cash)	**5.8%**	**5.7%**	**5.8%**	**6.0%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-10. New Office/Retail Development, L'Enfant Plaza				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$50.00	$50.70	$51.80	$52.80
Retail Rent (NNN)	$35.00	$35.00	$36.00	$37.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$16.00	$16.00	$16.00	$16.00
Development Costs				
Land Acquisition	$22,216,000	$27,878,000	$35,284,000	$44,431,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$11,616,000	$14,694,000	$18,690,000	$23,604,000
Retail Tenant Improvement Costs	$434,000	$434,000	$434,000	$434,000
Total Development Costs	**$92,685,000**	**$118,292,000**	**$150,308,000**	**$185,319,000**
Total Development Costs/Rentable Sq. Ft.	*$464*	*$471*	*$473*	*$464*
Development Feasibility				
Gross Rent (100% Occupancy)	$10,383,000	$13,119,000	$16,845,000	$21,487,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$9,863,900**	**$12,463,100**	**$16,002,800**	**$20,412,700**
Operating Expenses	$3,098,000	$3,918,000	$4,984,000	$6,294,000
Net Operating Income	**$6,765,900**	**$8,545,100**	**$11,018,800**	**$14,118,700**
Return on Investment (Cash-on-Cash)	**7.3%**	**7.2%**	**7.3%**	**7.6%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-11. New Office/Retail Development, Federal Center SW				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$50.00	$50.70	$51.80	$52.80
Retail Rent (NNN)	$30.00	$30.00	$31.00	$32.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$16.00	$16.00	$16.00	$16.00
Development Costs				
Land Acquisition	$22,216,000	$27,878,000	$35,284,000	$44,431,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$11,616,000	$14,694,000	$18,690,000	$23,604,000
Retail Tenant Improvement Costs	$434,000	$434,000	$434,000	$434,000
Total Development Costs	**$92,685,000**	**$118,292,000**	**$150,308,000**	**$185,319,000**
Total Development Costs/Rentable Sq. Ft.	*$464*	*$471*	*$473*	*$464*
Development Feasibility				
Gross Rent (100% Occupancy)	$10,352,000	$13,088,000	$16,814,000	$21,456,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$9,834,400**	**$12,433,600**	**$15,973,300**	**$20,383,200**
Operating Expenses	$3,098,000	$3,918,000	$4,984,000	$6,294,000
Net Operating Income	**$6,736,400**	**$8,515,600**	**$10,989,300**	**$14,089,200**
Return on Investment (Cash-on-Cash)	**7.3%**	**7.2%**	**7.3%**	**7.6%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-12. New Office/Retail Development, Waterfront Station				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$40.00	$40.50	$41.40	$42.20
Retail Rent (NNN)	$25.00	$25.00	$26.00	$27.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$14.00	$14.00	$14.00	$14.00
Development Costs				
Land Acquisition	$9,997,000	$12,545,000	$15,878,000	$19,994,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$9,680,000	$12,245,000	$15,575,000	$19,670,000
Retail Tenant Improvement Costs	$310,000	$310,000	$310,000	$310,000
Total Development Costs	**$78,406,000**	**$100,386,000**	**$127,663,000**	**$156,824,000**
Total Development Costs/Rentable Sq. Ft.	*$392*	*$400*	*$402*	*$392*
Development Feasibility				
Gross Rent (100% Occupancy)	$8,385,000	$10,559,000	$13,543,000	$17,255,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$7,965,800**	**$10,031,100**	**$12,865,900**	**$16,392,300**
Operating Expenses	$2,710,000	$3,429,000	$4,361,000	$5,508,000
Net Operating Income	**$5,255,800**	**$6,602,100**	**$8,504,900**	**$10,884,300**
Return on Investment (Cash-on-Cash)	**6.7%**	**6.6%**	**6.7%**	**6.9%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-13. New Office/Retail Development, Friendship Heights				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$50.00	$50.70	$51.80	$52.80
Retail Rent (NNN)	$50.00	$50.00	$51.00	$52.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$18.00	$18.00	$18.00	$18.00
Development Costs				
Land Acquisition	$16,662,000	$20,909,000	$26,463,000	$33,323,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$11,616,000	$14,694,000	$18,690,000	$23,604,000
Retail Tenant Improvement Costs	$403,000	$403,000	$403,000	$403,000
Total Development Costs	**$87,100,000**	**$111,292,000**	**$141,456,000**	**$174,180,000**
Total Development Costs/Rentable Sq. Ft.	*$436*	*$443*	*$445*	*$436*
Development Feasibility				
Gross Rent (100% Occupancy)	$10,476,000	$13,212,000	$16,938,000	$21,580,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$9,952,200**	**$12,551,400**	**$16,091,100**	**$20,501,000**
Operating Expenses	$3,485,000	$4,408,000	$5,607,000	$7,081,000
Net Operating Income	**$6,467,200**	**$8,143,400**	**$10,484,100**	**$13,420,000**
Return on Investment (Cash-on-Cash)	**7.4%**	**7.3%**	**7.4%**	**7.7%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-14. New Office/Retail Development, IntelSat				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$45.00	$45.60	$46.60	$47.50
Retail Rent (NNN)	$35.00	$35.00	$36.00	$37.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$17.00	$17.00	$17.00	$17.00
Development Costs				
Land Acquisition	$13,329,000	$16,727,000	$21,170,000	$26,659,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$10,648,000	$13,470,000	$17,133,000	$21,637,000
Retail Tenant Improvement Costs	$372,000	$372,000	$372,000	$372,000
Total Development Costs	**$82,768,000**	**$105,855,000**	**$134,575,000**	**$165,518,000**
Total Development Costs/Rentable Sq. Ft.	*$414*	*$422*	*$424*	*$414*
Development Feasibility				
Gross Rent (100% Occupancy)	$9,415,000	$11,870,000	$15,225,000	$19,402,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$8,944,300**	**$11,276,500**	**$14,463,800**	**$18,431,900**
Operating Expenses	$3,291,000	$4,163,000	$5,296,000	$6,688,000
Net Operating Income	**$5,653,300**	**$7,113,500**	**$9,167,800**	**$11,743,900**
Return on Investment (Cash-on-Cash)	**6.8%**	**6.7%**	**6.8%**	**7.1%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-15. New Office/Retail Development, Rhode Island Avenue				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$35.00	$35.50	$36.20	$36.90
Retail Rent (NNN)	$20.00	$20.00	$21.00	$22.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$12.00	$12.00	$12.00	$12.00
Development Costs				
Land Acquisition	$7,775,000	$9,757,000	$12,349,000	$15,551,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$9,680,000	$12,245,000	$15,575,000	$19,670,000
Retail Tenant Improvement Costs	$217,000	$217,000	$217,000	$217,000
Total Development Costs	**$76,091,000**	**$97,505,000**	**$124,041,000**	**$152,288,000**
Total Development Costs/Rentable Sq. Ft.	*$381*	*$388*	*$390*	*$381*
Development Feasibility				
Gross Rent (100% Occupancy)	$7,386,000	$9,304,000	$11,893,000	$15,139,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$7,016,700**	**$8,838,800**	**$11,298,400**	**$14,382,100**
Operating Expenses	$2,323,000	$2,939,000	$3,738,000	$4,721,000
Net Operating Income	**$4,693,700**	**$5,899,800**	**$7,560,400**	**$9,661,100**
Return on Investment (Cash-on-Cash)	**6.2%**	**6.1%**	**6.1%**	**6.3%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-16. New Office/Retail Development, Poplar Point				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$35.00	$35.50	$36.20	$36.90
Retail Rent (NNN)	$20.00	$20.00	$21.00	$22.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$14.00	$14.00	$14.00	$14.00
Development Costs				
Land Acquisition	$4,443,000	$5,576,000	$7,057,000	$8,886,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$9,680,000	$12,245,000	$15,575,000	$19,670,000
Retail Tenant Improvement Costs	$372,000	$372,000	$372,000	$372,000
Total Development Costs	**$72,914,000**	**$93,479,000**	**$118,904,000**	**$145,778,000**
Total Development Costs/Rentable Sq. Ft.	*$365*	*$372*	*$374*	*$365*
Development Feasibility				
Gross Rent (100% Occupancy)	$7,386,000	$9,304,000	$11,893,000	$15,139,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$7,016,700**	**$8,838,800**	**$11,298,400**	**$14,382,100**
Operating Expenses	$2,710,000	$3,429,000	$4,361,000	$5,508,000
Net Operating Income	**$4,306,700**	**$5,409,800**	**$6,937,400**	**$8,874,100**
Return on Investment (Cash-on-Cash)	**5.9%**	**5.8%**	**5.8%**	**6.1%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-17. New Office/Retail Development, Congress Heights				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$30.00	$30.40	$31.10	$31.70
Retail Rent (NNN)	$20.00	$20.00	$21.00	$22.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$11.00	$11.00	$11.00	$11.00
Development Costs				
Land Acquisition	$3,332,000	$4,182,000	$5,293,000	$6,665,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$5,808,000	$7,347,000	$9,345,000	$11,802,000
Retail Tenant Improvement Costs	$248,000	$248,000	$248,000	$248,000
Total Development Costs	**$67,807,000**	**$87,063,000**	**$110,786,000**	**$135,565,000**
Total Development Costs/Rentable Sq. Ft.	*$339*	*$347*	*$349*	*$339*
Development Feasibility				
Gross Rent (100% Occupancy)	$6,418,000	$8,055,000	$10,304,000	$13,093,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,097,100**	**$7,652,300**	**$9,788,800**	**$12,438,400**
Operating Expenses	$2,130,000	$2,694,000	$3,427,000	$4,327,000
Net Operating Income	**$3,967,100**	**$4,958,300**	**$6,361,800**	**$8,111,400**
Return on Investment (Cash-on-Cash)	**5.9%**	**5.7%**	**5.7%**	**6.0%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-18. New Office/Retail Development, Buzzard Point				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$40.00	$40.50	$41.40	$42.20
Retail Rent (NNN)	$30.00	$30.00	$31.00	$32.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$15.00	$15.00	$15.00	$15.00
Development Costs				
Land Acquisition	$7,775,000	$9,757,000	$12,349,000	$15,551,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$9,680,000	$12,245,000	$15,575,000	$19,670,000
Retail Tenant Improvement Costs	$372,000	$372,000	$372,000	$372,000
Total Development Costs	**$76,246,000**	**$97,660,000**	**$124,196,000**	**$152,443,000**
Total Development Costs/Rentable Sq. Ft.	*$382*	*$389*	*$391*	*$381*
Development Feasibility				
Gross Rent (100% Occupancy)	$8,416,000	$10,590,000	$13,574,000	$17,286,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$7,995,200**	**$10,060,500**	**$12,895,300**	**$16,421,700**
Operating Expenses	$2,904,000	$3,674,000	$4,673,000	$5,901,000
Net Operating Income	**$5,091,200**	**$6,386,500**	**$8,222,300**	**$10,520,700**
Return on Investment (Cash-on-Cash)	**6.7%**	**6.5%**	**6.6%**	**6.9%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-19. New Office/Retail Development, Armed Forces Retirement Home				
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Height (Feet)	130	160	200	250
Site Coverage	95%	95%	95%	95%
Future FAR	10.2	12.8	16.2	20.4
Gross Square Feet	222,000	279,000	353,000	444,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.7	0.6	0.5	0.4
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	199,800	251,100	317,700	399,600
Office	193,600	244,900	311,500	393,400
Retail	6,200	6,200	6,200	6,200
Operating Inputs				
Office Rent (Full Service)	$30.00	$30.40	$31.10	$31.70
Retail Rent (NNN)	$18.00	$18.00	$19.00	$20.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$11.00	$11.00	$11.00	$11.00
Development Costs				
Land Acquisition	$6,665,000	$8,364,000	$10,585,000	$13,329,000
Construction Costs	$31,080,000	$41,850,000	$56,480,000	$71,040,000
Site Improvement/Infrastructure Costs	$2,220,000	$2,232,000	$2,224,000	$2,220,000
Demolition Costs	$1,324,000	$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$7,104,000	$8,370,000	$8,472,000	$8,880,000
Soft Costs	$16,691,000	$21,510,000	$27,400,000	$33,386,000
Office Tenant Improvement Costs	$5,808,000	$7,347,000	$9,345,000	$11,802,000
Retail Tenant Improvement Costs	$186,000	$186,000	$186,000	$186,000
Total Development Costs	**$71,078,000**	**$91,183,000**	**$116,016,000**	**$142,167,000**
Total Development Costs/Rentable Sq. Ft.	*$356*	*$363*	*$365*	*$356*
Development Feasibility				
Gross Rent (100% Occupancy)	$6,406,000	$8,043,000	$10,291,000	$13,081,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,085,700**	**$7,640,900**	**$9,776,500**	**$12,427,000**
Operating Expenses	$2,130,000	$2,694,000	$3,427,000	$4,327,000
Net Operating Income	**$3,955,700**	**$4,946,900**	**$6,349,500**	**$8,100,000**
Return on Investment (Cash-on-Cash)	**5.6%**	**5.4%**	**5.5%**	**5.7%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-20. New Apartment Development, West End, 22nd at M Street, NW							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$2,235	38	50	57
1 BR	750	45%	91	$3,015	116	149	194
2 BR	1,050	38%	76	$4,120	97	125	163
3 BR	1,250	2%	3	$4,650	5	6	8
Average Market-Rate Monthly Rent	$3,337				$3,373	$3,395	$3,455
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$3,200				$3,210	$3,200	$3,220
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$8.00				$8.00	$8.00	$8.00
Development Costs							
Land Acquisition	$42,210,000				$52,969,000	$67,039,000	$84,419,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$364,000				$364,000	$364,000	$364,000
Total Development Costs	**$100,041,000**				**$128,286,000**	**$169,404,000**	**$210,741,000**
Total Development Costs/Unit	*$456,800*				*$459,800*	*$471,900*	*$459,100*
Development Feasibility							
Gross Rent (100% Occupancy)	$8,975,900				$11,388,200	$14,748,900	$18,945,800
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$8,527,100**				**$10,818,800**	**$14,011,500**	**$17,998,500**
Operating Expenses	$1,462,000				$1,869,000	$2,398,000	$3,067,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$6,988,100**				**$8,851,800**	**$11,487,500**	**$14,770,500**
Return on Investment (Cash-on-Cash)	**7.0%**				**6.9%**	**6.8%**	**7.0%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-21. New Apartment Development, NoMa							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,770	38	50	57
1 BR	750	45%	91	$2,545	116	149	194
2 BR	1,050	38%	76	$3,355	97	125	163
3 BR	1,250	2%	3	$3,745	5	6	8
Average Market-Rate Monthly Rent	$2,750				$2,780	$2,797	$2,848
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$2,660				$2,670	$2,660	$2,680
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$7.25				$7.25	$7.25	$7.25
Development Costs							
Land Acquisition	$17,772,000				$22,303,000	$28,227,000	$35,545,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$392,000				$392,000	$392,000	$392,000
Total Development Costs	**$75,631,000**				**$97,648,000**	**$130,620,000**	**$161,895,000**
Total Development Costs/Unit	*$345,300*				*$350,000*	*$363,800*	*$352,700*
Development Feasibility							
Gross Rent (100% Occupancy)	$7,559,400				$9,564,500	$12,382,400	$15,872,500
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$7,181,400**				**$9,086,300**	**$11,763,300**	**$15,078,900**
Operating Expenses	$1,325,000				$1,694,000	$2,174,000	$2,780,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$5,779,400**				**$7,294,300**	**$9,463,300**	**$12,137,900**
Return on Investment (Cash-on-Cash)	**7.6%**				**7.5%**	**7.2%**	**7.5%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-22. New Apartment Development, 5th at K Street, NW							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,630	38	50	57
1 BR	750	45%	91	$2,320	116	149	194
2 BR	1,050	38%	76	$3,040	97	125	163
3 BR	1,250	2%	3	$3,370	5	6	8
Average Market-Rate Monthly Rent	$2,501				$2,528	$2,544	$2,590
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$2,430				$2,440	$2,430	$2,450
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$7.00				$7.00	$7.00	$7.00
Development Costs							
Land Acquisition	$17,772,000				$22,303,000	$28,227,000	$35,545,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$364,000				$364,000	$364,000	$364,000
Total Development Costs	**$75,603,000**				**$97,620,000**	**$130,592,000**	**$161,867,000**
Total Development Costs/Unit	*$345,200*				*$349,900*	*$363,800*	*$352,700*
Development Feasibility							
Gross Rent (100% Occupancy)	$6,960,900				$8,792,900	$11,382,000	$14,567,700
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,612,900**				**$8,353,300**	**$10,812,900**	**$13,839,300**
Operating Expenses	$1,279,000				$1,635,000	$2,099,000	$2,684,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$5,256,900**				**$6,620,300**	**$8,587,900**	**$10,994,300**
Return on Investment (Cash-on-Cash)	**7.0%**				**6.8%**	**6.6%**	**6.8%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-23. New Apartment Development, Florida Avenue Market							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,435	38	50	57
1 BR	750	45%	91	$2,020	116	149	194
2 BR	1,050	38%	76	$2,620	97	125	163
3 BR	1,250	2%	3	$2,870	5	6	8
Average Market-Rate Monthly Rent	$2,169				$2,192	$2,206	$2,246
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$2,120				$2,130	$2,130	$2,140
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$6.50				$6.50	$6.50	$6.50
Development Costs							
Land Acquisition	$8,886,000				$11,151,000	$14,113,000	$17,772,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$196,000				$196,000	$196,000	$196,000
Total Development Costs	**$66,549,000**				**$86,300,000**	**$116,310,000**	**$143,926,000**
Total Development Costs/Unit	*$303,900*				*$309,300*	*$324,000*	*$313,600*
Development Feasibility							
Gross Rent (100% Occupancy)	$6,159,700				$7,760,300	$10,043,100	$12,822,200
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$5,851,700**				**$7,372,300**	**$9,540,900**	**$12,181,100**
Operating Expenses	$1,188,000				$1,518,000	$1,949,000	$2,492,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$4,586,700**				**$5,756,300**	**$7,465,900**	**$9,528,100**
Return on Investment (Cash-on-Cash)	**6.9%**				**6.7%**	**6.4%**	**6.6%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-24. New Apartment Development, L'Enfant Plaza							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,435	38	50	57
1 BR	750	45%	91	$2,020	116	149	194
2 BR	1,050	38%	76	$2,620	97	125	163
3 BR	1,250	2%	3	$2,870	5	6	8
Average Market-Rate Monthly Rent	$2,169				$2,192	$2,206	$2,246
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$2,120				$2,130	$2,130	$2,140
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$6.50				$6.50	$6.50	$6.50
Development Costs							
Land Acquisition	$22,216,000				$27,878,000	$35,284,000	$44,431,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$392,000				$392,000	$392,000	$392,000
Total Development Costs	**$80,075,000**				**$103,223,000**	**$137,677,000**	**$170,781,000**
Total Development Costs/Unit	*$365,600*				*$370,000*	*$383,500*	*$372,100*
Development Feasibility							
Gross Rent (100% Occupancy)	$6,159,700				$7,760,300	$10,043,100	$12,822,200
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$5,851,700**				**$7,372,300**	**$9,540,900**	**$12,181,100**
Operating Expenses	$1,188,000				$1,518,000	$1,949,000	$2,492,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$4,586,700**				**$5,756,300**	**$7,465,900**	**$9,528,100**
Return on Investment (Cash-on-Cash)	**5.7%**				**5.6%**	**5.4%**	**5.6%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-25. New Apartment Development, Federal Center SW							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,380	38	50	57
1 BR	750	45%	91	$1,945	116	149	194
2 BR	1,050	38%	76	$2,515	97	125	163
3 BR	1,250	2%	3	$2,745	5	6	8
Average Market-Rate Monthly Rent	$2,085				$2,107	$2,121	$2,159
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$2,050				$2,050	$2,050	$2,060
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$6.25				$6.25	$6.25	$6.25
Development Costs							
Land Acquisition	$22,216,000				$27,878,000	$35,284,000	$44,431,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$392,000				$392,000	$392,000	$392,000
Total Development Costs	**$80,075,000**				**$103,223,000**	**$137,677,000**	**$170,781,000**
Total Development Costs/Unit	*$365,600*				*$370,000*	*$383,500*	*$372,100*
Development Feasibility							
Gross Rent (100% Occupancy)	$5,957,100				$7,499,300	$9,704,500	$12,381,400
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$5,659,200**				**$7,124,300**	**$9,219,300**	**$11,762,300**
Operating Expenses	$1,142,000				$1,460,000	$1,874,000	$2,396,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$4,440,200**				**$5,566,300**	**$7,219,300**	**$9,205,300**
Return on Investment (Cash-on-Cash)	**5.5%**				**5.4%**	**5.2%**	**5.4%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-26. New Apartment Development, Waterfront Station							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,485	38	50	57
1 BR	750	45%	91	$2,095	116	149	194
2 BR	1,050	38%	76	$2,725	97	125	163
3 BR	1,250	2%	3	$2,995	5	6	8
Average Market-Rate Monthly Rent	$2,253				$2,277	$2,291	$2,332
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$2,200				$2,210	$2,210	$2,220
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$6.75				$6.75	$6.75	$6.75
Development Costs							
Land Acquisition	$9,997,000				$12,545,000	$15,878,000	$19,994,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$280,000				$280,000	$280,000	$280,000
Total Development Costs	**$67,744,000**				**$87,778,000**	**$118,159,000**	**$146,232,000**
Total Development Costs/Unit	*$309,300*				*$314,600*	*$329,100*	*$318,600*
Development Feasibility							
Gross Rent (100% Occupancy)	$6,360,400				$8,019,000	$10,378,600	$13,259,500
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,042,400**				**$7,618,100**	**$9,859,700**	**$12,596,500**
Operating Expenses	$1,233,000				$1,577,000	$2,024,000	$2,588,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$4,732,400**				**$5,943,100**	**$7,709,700**	**$9,847,500**
Return on Investment (Cash-on-Cash)	**7.0%**				**6.8%**	**6.5%**	**6.7%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-27. New Apartment Development, Friendship Heights							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,730	38	50	57
1 BR	750	45%	91	$2,470	116	149	194
2 BR	1,050	38%	76	$3,250	97	125	163
3 BR	1,250	2%	3	$3,620	5	6	8
Average Market-Rate Monthly Rent	$2,668				$2,697	$2,714	$2,763
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$2,580				$2,590	$2,590	$2,600
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$7.25				$7.25	$7.25	$7.25
Development Costs							
Land Acquisition	$16,662,000				$20,909,000	$26,463,000	$33,323,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$364,000				$364,000	$364,000	$364,000
Total Development Costs	**$74,493,000**				**$96,226,000**	**$128,828,000**	**$159,645,000**
Total Development Costs/Unit	*$340,200*				*$344,900*	*$358,900*	*$347,800*
Development Feasibility							
Gross Rent (100% Occupancy)	$7,362,400				$9,310,300	$12,053,000	$15,442,300
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,994,300**				**$8,844,800**	**$11,450,400**	**$14,670,200**
Operating Expenses	$1,325,000				$1,694,000	$2,174,000	$2,780,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$5,592,300**				**$7,052,800**	**$9,150,400**	**$11,729,200**
Return on Investment (Cash-on-Cash)	**7.5%**				**7.3%**	**7.1%**	**7.3%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

PES Partners for Economic Solutions

Table C-28. New Apartment Development, IntelSat							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,685	38	50	57
1 BR	750	45%	91	$2,395	116	149	194
2 BR	1,050	38%	76	$3,145	97	125	163
3 BR	1,250	2%	3	$3,495	5	6	8
Average Market-Rate Monthly Rent	$2,585				$2,613	$2,630	$2,677
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$2,510				$2,510	$2,510	$2,530
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$7.25				$7.25	$7.25	$7.25
Development Costs							
Land Acquisition	$13,329,000				$16,727,000	$21,170,000	$26,659,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$336,000				$336,000	$336,000	$336,000
Total Development Costs	**$71,132,000**				**$92,016,000**	**$123,507,000**	**$152,953,000**
Total Development Costs/Unit	*$324,800*				*$329,800*	*$344,000*	*$333,200*
Development Feasibility							
Gross Rent (100% Occupancy)	$7,163,500				$9,053,900	$11,720,500	$15,008,500
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,805,300**				**$8,601,200**	**$11,134,500**	**$14,258,100**
Operating Expenses	$1,325,000				$1,694,000	$2,174,000	$2,780,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$5,403,300**				**$6,809,200**	**$8,834,500**	**$11,317,100**
Return on Investment (Cash-on-Cash)	**7.6%**				**7.4%**	**7.2%**	**7.4%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

PES Partners for Economic Solutions

Table C-29. New Apartment Development, Rhode Island Avenue							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,285	38	50	57
1 BR	750	45%	91	$1,795	116	149	194
2 BR	1,050	38%	76	$2,305	97	125	163
3 BR	1,250	2%	3	$2,495	5	6	8
Average Market-Rate Monthly Rent	$1,920				$1,940	$1,952	$1,987
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$1,900				$1,900	$1,900	$1,910
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$6.25				$6.25	$6.25	$6.25
Development Costs							
Land Acquisition	$7,775,000				$9,757,000	$12,349,000	$15,551,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$196,000				$196,000	$196,000	$196,000
Total Development Costs	**$65,438,000**				**$84,906,000**	**$114,546,000**	**$141,705,000**
Total Development Costs/Unit	*$298,800*				*$304,300*	*$319,100*	*$308,700*
Development Feasibility							
Gross Rent (100% Occupancy)	$5,557,400				$6,984,200	$9,036,600	$11,510,400
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$5,279,500**				**$6,635,000**	**$8,584,800**	**$10,934,900**
Operating Expenses	$1,142,000				$1,460,000	$1,874,000	$2,396,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$4,060,500**				**$5,077,000**	**$6,584,800**	**$8,377,900**
Return on Investment (Cash-on-Cash)	**6.2%**				**6.0%**	**5.7%**	**5.9%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

PES Partners for Economic Solutions

Table C-30. New Apartment Development, Poplar Point							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,335	38	50	57
1 BR	750	45%	91	$1,870	116	149	194
2 BR	1,050	38%	76	$2,410	97	125	163
3 BR	1,250	2%	3	$2,620	5	6	8
Average Market-Rate Monthly Rent	$2,003				$2,024	$2,037	$2,073
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$1,970				$1,980	$1,970	$1,980
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$6.50				$6.50	$6.50	$6.50
Development Costs							
Land Acquisition	$4,443,000				$5,576,000	$7,057,000	$8,886,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$336,000				$336,000	$336,000	$336,000
Total Development Costs	**$62,246,000**				**$80,865,000**	**$109,394,000**	**$135,180,000**
Total Development Costs/Unit	*$284,200*				*$289,800*	*$304,700*	*$294,500*
Development Feasibility							
Gross Rent (100% Occupancy)	$5,758,200				$7,242,900	$9,372,100	$11,947,700
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$5,470,300**				**$6,880,800**	**$8,903,500**	**$11,350,300**
Operating Expenses	$1,188,000				$1,518,000	$1,949,000	$2,492,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$4,205,300**				**$5,264,800**	**$6,828,500**	**$8,697,300**
Return on Investment (Cash-on-Cash)	**6.8%**				**6.5%**	**6.2%**	**6.4%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

PES Partners for Economic Solutions

Table C-31. New Apartment Development, Congress Heights							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,035	38	50	57
1 BR	750	45%	91	$1,420	116	149	194
2 BR	1,050	38%	76	$1,780	97	125	163
3 BR	1,250	2%	3	$1,870	5	6	8
Average Market-Rate Monthly Rent	$1,503				$1,519	$1,529	$1,555
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$1,510				$1,520	$1,510	$1,520
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$6.00				$6.00	$6.00	$6.00
Development Costs							
Land Acquisition	$3,332,000				$4,182,000	$5,293,000	$6,665,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$224,000				$224,000	$224,000	$224,000
Total Development Costs	**$61,023,000**				**$79,359,000**	**$107,518,000**	**$132,847,000**
Total Development Costs/Unit	*$278,600*				*$284,400*	*$299,500*	*$289,400*
Development Feasibility							
Gross Rent (100% Occupancy)	$4,553,600				$5,690,600	$7,359,100	$9,324,100
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$4,325,900**				**$5,406,100**	**$6,991,100**	**$8,857,900**
Operating Expenses	$1,096,000				$1,402,000	$1,799,000	$2,300,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$3,152,900**				**$3,906,100**	**$5,066,100**	**$6,396,900**
Return on Investment (Cash-on-Cash)	**5.2%**				**4.9%**	**4.7%**	**4.8%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

PES Partners for Economic Solutions

Table C-32. New Apartment Development, Buzzard Point							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,580	38	50	57
1 BR	750	45%	91	$2,245	116	149	194
2 BR	1,050	38%	76	$2,935	97	125	163
3 BR	1,250	2%	3	$3,245	5	6	8
Average Market-Rate Monthly Rent	$2,418				$2,444	$2,460	$2,504
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$2,350				$2,360	$2,360	$2,370
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$6.75				$6.75	$6.75	$6.75
Development Costs							
Land Acquisition	$7,775,000				$9,757,000	$12,349,000	$15,551,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$336,000				$336,000	$336,000	$336,000
Total Development Costs	**$65,578,000**				**$85,046,000**	**$114,686,000**	**$141,845,000**
Total Development Costs/Unit	*$299,400*				*$304,800*	*$319,500*	*$309,000*
Development Feasibility							
Gross Rent (100% Occupancy)	$6,760,100				$8,534,200	$11,046,500	$14,130,500
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,422,100**				**$8,107,500**	**$10,494,200**	**$13,424,000**
Operating Expenses	$1,233,000				$1,577,000	$2,024,000	$2,588,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$5,112,100**				**$6,432,500**	**$8,344,200**	**$10,675,000**
Return on Investment (Cash-on-Cash)	**7.8%**				**7.6%**	**7.3%**	**7.5%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

PES Partners for Economic Solutions

Table C-33. New Apartment Development, Armed Forces Retirement Home							
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Height (Feet)	130				160	200	250
Site Coverage Ratio	85%				85%	85%	85%
Future FAR	10.2				12.8	16.2	20.4
Future Project Density (DU/AC)	439				559	719	919
Base Project Size (Units)	219				279	359	459
Market-Rate Units	201				256	330	422
Affordable Units	18				23	29	37
Parking Ratio (Spaces per Unit)	0.5				0.5	0.5	0.4
Residential Parking Spaces	108				108	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	-				-	54	54
Total Residential Rentable Square Feet	182,700				233,600	299,800	383,400
First-Floor Space Rented	5,600				5,600	5,600	5,600
Common Area	38,800				47,800	59,500	74,200
Total Gross Square Feet	221,500				281,400	359,300	457,600
Average Unit Size (Square Feet)	834				837	835	835
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	31	$1,285	38	50	57
1 BR	750	45%	91	$1,795	116	149	194
2 BR	1,050	38%	76	$2,305	97	125	163
3 BR	1,250	2%	3	$2,495	5	6	8
Average Market-Rate Monthly Rent	$1,920				$1,940	$1,952	$1,987
Affordable Units							
Efficiency	495	15%	2	$1,393	3	4	12
1 BR	750	45%	8	$1,547	10	13	13
2 BR	1,050	38%	7	$1,717	9	11	11
3 BR	1,250	2%	1	$2,090	1	1	1
Average Affordable Monthly Rent	$1,626				$1,617	$1,609	$1,562
Average Monthly Rent	$1,900				$1,900	$1,900	$1,910
Rent Premium for Additional Floors	0.0%				0.7%	1.5%	2.6%
Monthly Parking Rate	$250				$250	$250	$250
First-Floor Commercial Rent	$45				$45	$45	$45
Operating Expense per Square Foot, Excluding Utilities	$6.00				$6.00	$6.00	$6.00
Development Costs							
Land Acquisition	$6,665,000				$8,364,000	$10,585,000	$13,329,000
Construction Costs	$34,333,000				$46,431,000	$62,878,000	$80,080,000
Site Improvement/Infrastructure Costs	$2,658,000				$2,701,000	$2,731,000	$2,746,000
Demolition Costs	$1,324,000				$1,324,000	$1,324,000	$1,324,000
Parking Construction Costs	$4,253,000				$5,065,000	$8,623,000	$9,152,000
Soft Costs	$14,899,000				$19,432,000	$26,445,000	$32,656,000
Commercial Tenant Improv. Costs	$168,000				$168,000	$168,000	$168,000
Total Development Costs	**$64,300,000**				**$83,485,000**	**$112,754,000**	**$139,455,000**
Total Development Costs/Unit	*$293,600*				*$299,200*	*$314,100*	*$303,800*
Development Feasibility							
Gross Rent (100% Occupancy)	$5,557,400				$6,984,200	$9,036,600	$11,510,400
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$5,279,500**				**$6,635,000**	**$8,584,800**	**$10,934,900**
Operating Expenses	$1,096,000				$1,402,000	$1,799,000	$2,300,000
Replacement Reserves	$77,000				$98,000	$126,000	$161,000
Net Operating Income	**$4,106,500**				**$5,135,000**	**$6,659,800**	**$8,473,900**
Return on Investment (Cash-on-Cash)	**6.4%**				**6.2%**	**5.9%**	**6.1%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-34. Expansion and Renovation of Office Building, 17th at K Street, NW				
	Class C Building		Class A Building	
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Site Coverage	95%	95%	95%	95%
Existing Building (Gross Square Feet)	166,000	166,000	166,000	166,000
Existing Height (Stories)	8	8	8	8
Existing Floorplate (Square Feet)	20,750	20,750	20,750	20,750
Height (Feet)	130	160	130	160
Additional Stories	2	4	2	4
Future Gross Square Feet	207,500	249,000	41,500	83,000
Existing Gross Square Feet	166,000	166,000	-	-
New Gross Square Feet	41,500	83,000	41,500	83,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.8	0.7	0.8	0.7
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	186,800	224,100	37,400	74,700
Office	180,600	217,900	37,400	74,700
Retail	6,200	6,200	-	-
Operating Inputs				
Office Rent (Full Service)	$70.00	$71.00	$70.00	$71.00
Retail Rent (NNN)	$60.00	$60.00	$60.00	$60.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$28.00	$28.00	$28.00	$28.00
Development Costs				
Building Acquisition	$56,772,000	$62,250,000	$0	$0
Construction Costs for Additional Floors	$5,976,000	$14,525,000	$5,976,000	$14,525,000
Renovation Costs for Existing Space	$16,600,000	$16,600,000	$0	$0
Lost Rent During Construction (10% for 12 months)			$1,002,400	$1,016,720
Site Improvement/Infrastructure Costs	$249,000	$332,000	$249,000	$332,000
Demolition Costs	$0	$0	$0	$0
Parking Construction Costs	$0	$0	$0	$0
Soft Costs	$9,130,000	$12,582,800	$2,891,000	$6,349,500
Office Tenant Improvement Costs	$16,254,000	$19,611,000	$3,362,000	$6,723,000
Retail Tenant Improvement Costs	$496,000	$496,000	$0	$0
Total Development Costs	**$105,477,000**	**$126,396,800**	**$13,480,400**	**$28,946,220**
Total Development Costs/Rentable Sq. Ft.	*$565*	*$564*	*$360*	*$387*
Development Feasibility				
Gross Rent (100% Occupancy)	$13,500,000	$16,329,000	$2,618,000	$5,304,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$12,825,000**	**$15,512,600**	**$2,487,100**	**$5,038,800**
Operating Expenses	$5,057,000	$6,101,000	$1,047,000	$2,092,000
Net Operating Income	**$7,768,000**	**$9,411,600**	**$1,440,100**	**$2,946,800**
Return on Investment (Cash-on-Cash)	**7.4%**	**7.4%**	**10.7%**	**10.2%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-35. Expansion and Renovation of Office Building, West End, 22nd at M Street, NW				
	Class C Building		Class A Building	
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Site Coverage	95%	95%	95%	95%
Existing Building (Gross Square Feet)	166,000	166,000	166,000	166,000
Existing Height (Stories)	8	8	8	8
Existing Floorplate (Square Feet)	20,750	20,750	20,750	20,750
Height (Feet)	130	160	130	160
Additional Stories	2	4	2	4
Future Gross Square Feet	207,500	249,000	41,500	83,000
Existing Gross Square Feet	166,000	166,000	-	-
New Gross Square Feet	41,500	83,000	41,500	83,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.8	0.7	0.8	0.7
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	186,800	224,100	37,400	74,700
Office	180,600	217,900	37,400	74,700
Retail	6,200	6,200	-	-
Operating Inputs				
Office Rent (Full Service)	$55.00	$55.80	$55.00	$55.80
Retail Rent (NNN)	$45.00	$45.00	$45.00	$45.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$21.00	$21.00	$21.00	$21.00
Development Costs				
Building Acquisition	$41,002,000	$47,310,000	$0	$0
Construction Costs for Additional Floors	$5,976,000	$14,525,000	$5,976,000	$14,525,000
Renovation Costs for Existing Space	$16,600,000	$16,600,000	$0	$0
Lost Rent During Construction (10% for 12 months)			$787,600	$799,056
Site Improvement/Infrastructure Costs	$249,000	$332,000	$249,000	$332,000
Demolition Costs	$0	$0	$0	$0
Parking Construction Costs	$0	$0	$0	$0
Soft Costs	$9,130,000	$12,582,800	$2,805,000	$6,262,400
Office Tenant Improvement Costs	$11,739,000	$14,164,000	$2,428,000	$4,856,000
Retail Tenant Improvement Costs	$403,000	$403,000	$0	$0
Total Development Costs	**$85,099,000**	**$105,916,800**	**$12,245,600**	**$26,774,456**
Total Development Costs/Rentable Sq. Ft.	*$456*	*$473*	*$327*	*$358*
Development Feasibility				
Gross Rent (100% Occupancy)	$10,698,000	$12,924,000	$2,057,000	$4,168,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$10,163,100**	**$12,277,800**	**$1,954,200**	**$3,959,600**
Operating Expenses	$3,793,000	$4,576,000	$785,000	$1,569,000
Net Operating Income	**$6,370,100**	**$7,701,800**	**$1,169,200**	**$2,390,600**
Return on Investment (Cash-on-Cash)	**7.5%**	**7.3%**	**9.5%**	**8.9%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-36. Expansion and Renovation of Office Building, NoMa				
	Class C Building		Class A Building	
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Site Coverage	95%	95%	95%	95%
Existing Building (Gross Square Feet)	166,000	166,000	166,000	166,000
Existing Height (Stories)	8	8	8	8
Existing Floorplate (Square Feet)	20,750	20,750	20,750	20,750
Height (Feet)	130	160	130	160
Additional Stories	2	4	2	4
Future Gross Square Feet	207,500	249,000	41,500	83,000
Existing Gross Square Feet	166,000	166,000	-	-
New Gross Square Feet	41,500	83,000	41,500	83,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.8	0.7	0.8	0.7
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	186,800	224,100	37,400	74,700
Office	180,600	217,900	37,400	74,700
Retail	6,200	6,200	-	-
Operating Inputs				
Office Rent (Full Service)	$45.00	$45.70	$45.00	$45.70
Retail Rent (NNN)	$35.00	$35.00	$35.00	$35.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$17.00	$17.00	$17.00	$17.00
Development Costs				
Building Acquisition	$16,600,000	$19,920,000	$0	$0
Construction Costs for Additional Floors	$5,976,000	$14,525,000	$5,976,000	$14,525,000
Renovation Costs for Existing Space	$16,600,000	$16,600,000	$0	$0
Lost Rent During Construction (10% for 12 months)			$644,400	$654,424
Site Improvement/Infrastructure Costs	$249,000	$332,000	$249,000	$332,000
Demolition Costs	$0	$0	$0	$0
Parking Construction Costs	$0	$0	$0	$0
Soft Costs	$9,130,000	$12,582,800	$2,747,800	$6,204,600
Office Tenant Improvement Costs	$10,836,000	$13,074,000	$2,241,000	$4,482,000
Retail Tenant Improvement Costs	$434,000	$434,000	$0	$0
Total Development Costs	**$59,825,000**	**$77,467,800**	**$11,858,200**	**$26,198,024**
Total Development Costs/Rentable Sq. Ft.	*$320*	*$346*	*$317*	*$351*
Development Feasibility				
Gross Rent (100% Occupancy)	$8,830,000	$10,661,000	$1,683,000	$3,414,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$8,388,500**	**$10,128,000**	**$1,598,900**	**$3,243,300**
Operating Expenses	$3,070,000	$3,704,000	$636,000	$1,270,000
Net Operating Income	**$5,318,500**	**$6,424,000**	**$962,900**	**$1,973,300**
Return on Investment (Cash-on-Cash)	**8.9%**	**8.3%**	**8.1%**	**7.5%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-37. Expansion and Renovation of Office Building, 5th at K Street, NW				
	Class C Building		Class A Building	
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Site Coverage	95%	95%	95%	95%
Existing Building (Gross Square Feet)	166,000	166,000	166,000	166,000
Existing Height (Stories)	8	8	8	8
Existing Floorplate (Square Feet)	20,750	20,750	20,750	20,750
Height (Feet)	130	160	130	160
Additional Stories	2	4	2	4
Future Gross Square Feet	207,500	249,000	41,500	83,000
Existing Gross Square Feet	166,000	166,000	-	-
New Gross Square Feet	41,500	83,000	41,500	83,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.8	0.7	0.8	0.7
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	186,800	224,100	37,400	74,700
Office	180,600	217,900	37,400	74,700
Retail	6,200	6,200	-	-
Operating Inputs				
Office Rent (Full Service)	$35.00	$35.50	$35.00	$35.50
Retail Rent (NNN)	$30.00	$30.00	$30.00	$30.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$15.00	$15.00	$15.00	$15.00
Development Costs				
Building Acquisition	$22,078,000	$22,078,000	$0	$0
Construction Costs for Additional Floors	$5,976,000	$14,525,000	$5,976,000	$14,525,000
Renovation Costs for Existing Space	$16,600,000	$16,600,000	$0	$0
Lost Rent During Construction (10% for 12 months)			$501,200	$508,360
Site Improvement/Infrastructure Costs	$249,000	$332,000	$249,000	$332,000
Demolition Costs	$0	$0	$0	$0
Parking Construction Costs	$0	$0	$0	$0
Soft Costs	$9,130,000	$12,582,800	$2,690,500	$6,146,100
Office Tenant Improvement Costs	$9,030,000	$10,895,000	$1,868,000	$3,735,000
Retail Tenant Improvement Costs	$403,000	$403,000	$0	$0
Total Development Costs	**$63,466,000**	**$77,415,800**	**$11,284,700**	**$25,246,460**
Total Development Costs/Rentable Sq. Ft.	*$340*	*$345*	*$302*	*$338*
Development Feasibility				
Gross Rent (100% Occupancy)	$6,993,000	$8,407,000	$1,309,000	$2,652,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,643,400**	**$7,986,700**	**$1,243,600**	**$2,519,400**
Operating Expenses	$2,709,000	$3,269,000	$561,000	$1,121,000
Net Operating Income	**$3,934,400**	**$4,717,700**	**$682,600**	**$1,398,400**
Return on Investment (Cash-on-Cash)	**6.2%**	**6.1%**	**6.0%**	**5.5%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-38. Expansion and Renovation of Office Building, L'Enfant Plaza				
	Class C Building		Class A Building	
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Site Coverage	95%	95%	95%	95%
Existing Building (Gross Square Feet)	166,000	166,000	166,000	166,000
Existing Height (Stories)	8	8	8	8
Existing Floorplate (Square Feet)	20,750	20,750	20,750	20,750
Height (Feet)	130	160	130	160
Additional Stories	2	4	2	4
Future Gross Square Feet	207,500	249,000	41,500	83,000
Existing Gross Square Feet	166,000	166,000	-	-
New Gross Square Feet	41,500	83,000	41,500	83,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.8	0.7	0.8	0.7
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	186,800	224,100	37,400	74,700
Office	180,600	217,900	37,400	74,700
Retail	6,200	6,200	-	-
Operating Inputs				
Office Rent (Full Service)	$45.00	$45.70	$45.00	$45.70
Retail Rent (NNN)	$35.00	$35.00	$35.00	$35.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$16.00	$16.00	$16.00	$16.00
Development Costs				
Building Acquisition	$50,464,000	$50,464,000	$0	$0
Construction Costs for Additional Floors	$5,976,000	$14,525,000	$5,976,000	$14,525,000
Renovation Costs for Existing Space	$16,600,000	$16,600,000	$0	$0
Lost Rent During Construction (10% for 12 months)			$644,400	$654,424
Site Improvement/Infrastructure Costs	$249,000	$332,000	$249,000	$332,000
Demolition Costs	$0	$0	$0	$0
Parking Construction Costs	$0	$0	$0	$0
Soft Costs	$9,130,000	$12,582,800	$2,747,800	$6,204,600
Office Tenant Improvement Costs	$10,836,000	$13,074,000	$2,241,000	$4,482,000
Retail Tenant Improvement Costs	$434,000	$434,000	$0	$0
Total Development Costs	**$93,689,000**	**$108,011,800**	**$11,858,200**	**$26,198,024**
Total Development Costs/Rentable Sq. Ft.	*$502*	*$482*	*$317*	*$351*
Development Feasibility				
Gross Rent (100% Occupancy)	$8,830,000	$10,661,000	$1,683,000	$3,414,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$8,388,500**	**$10,128,000**	**$1,598,900**	**$3,243,300**
Operating Expenses	$2,890,000	$3,486,000	$598,000	$1,195,000
Net Operating Income	**$5,498,500**	**$6,642,000**	**$1,000,900**	**$2,048,300**
Return on Investment (Cash-on-Cash)	**5.9%**	**6.1%**	**8.4%**	**7.8%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-39. Expansion and Renovation of Office Building, Federal Center SW				
	Class C Building		Class A Building	
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Site Coverage	95%	95%	95%	95%
Existing Building (Gross Square Feet)	166,000	166,000	166,000	166,000
Existing Height (Stories)	8	8	8	8
Existing Floorplate (Square Feet)	20,750	20,750	20,750	20,750
Height (Feet)	130	160	130	160
Additional Stories	2	4	2	4
Future Gross Square Feet	207,500	249,000	41,500	83,000
Existing Gross Square Feet	166,000	166,000	-	-
New Gross Square Feet	41,500	83,000	41,500	83,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.8	0.7	0.8	0.7
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	186,800	224,100	37,400	74,700
Office	180,600	217,900	37,400	74,700
Retail	6,200	6,200	-	-
Operating Inputs				
Office Rent (Full Service)	$45.00	$45.70	$45.00	$45.70
Retail Rent (NNN)	$30.00	$30.00	$30.00	$30.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$16.00	$16.00	$16.00	$16.00
Development Costs				
Building Acquisition	$66,234,000	$66,234,000	$0	$0
Construction Costs for Additional Floors	$5,976,000	$14,525,000	$5,976,000	$14,525,000
Renovation Costs for Existing Space	$16,600,000	$16,600,000	$0	$0
Lost Rent During Construction (10% for 12 months)			$644,400	$654,424
Site Improvement/Infrastructure Costs	$249,000	$332,000	$249,000	$332,000
Demolition Costs	$0	$0	$0	$0
Parking Construction Costs	$0	$0	$0	$0
Soft Costs	$9,130,000	$12,582,800	$2,747,800	$6,204,600
Office Tenant Improvement Costs	$10,836,000	$13,074,000	$2,241,000	$4,482,000
Retail Tenant Improvement Costs	$434,000	$434,000	$0	$0
Total Development Costs	**$109,459,000**	**$123,781,800**	**$11,858,200**	**$26,198,024**
Total Development Costs/Rentable Sq. Ft.	*$586*	*$552*	*$317*	*$351*
Development Feasibility				
Gross Rent (100% Occupancy)	$8,799,000	$10,630,000	$1,683,000	$3,414,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$8,359,100**	**$10,098,500**	**$1,598,900**	**$3,243,300**
Operating Expenses	$2,890,000	$3,486,000	$598,000	$1,195,000
Net Operating Income	**$5,469,100**	**$6,612,500**	**$1,000,900**	**$2,048,300**
Return on Investment (Cash-on-Cash)	**5.0%**	**5.3%**	**8.4%**	**7.8%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-40. Expansion and Renovation of Office Building, Waterfront Station				
	Class C Building		Class A Building	
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Site Coverage	95%	95%	95%	95%
Existing Building (Gross Square Feet)	166,000	166,000	166,000	166,000
Existing Height (Stories)	8	8	8	8
Existing Floorplate (Square Feet)	20,750	20,750	20,750	20,750
Height (Feet)	130	160	130	160
Additional Stories	2	4	2	4
Future Gross Square Feet	207,500	249,000	41,500	83,000
Existing Gross Square Feet	166,000	166,000	-	-
New Gross Square Feet	41,500	83,000	41,500	83,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.8	0.7	0.8	0.7
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	186,800	224,100	37,400	74,700
Office	180,600	217,900	37,400	74,700
Retail	6,200	6,200	-	-
Operating Inputs				
Office Rent (Full Service)	$35.00	$35.50	$35.00	$35.50
Retail Rent (NNN)	$25.00	$25.00	$25.00	$25.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$14.00	$14.00	$14.00	$14.00
Development Costs				
Building Acquisition	$41,002,000	$41,002,000	$0	$0
Construction Costs for Additional Floors	$5,976,000	$14,525,000	$5,976,000	$14,525,000
Renovation Costs for Existing Space	$16,600,000	$16,600,000	$0	$0
Lost Rent During Construction (10% for 12 months)			$501,200	$508,360
Site Improvement/Infrastructure Costs	$249,000	$332,000	$249,000	$332,000
Demolition Costs	$0	$0	$0	$0
Parking Construction Costs	$0	$0	$0	$0
Soft Costs	$9,130,000	$12,582,800	$2,690,500	$6,146,100
Office Tenant Improvement Costs	$9,030,000	$10,895,000	$1,868,000	$3,735,000
Retail Tenant Improvement Costs	$310,000	$310,000	$0	$0
Total Development Costs	**$82,297,000**	**$96,246,800**	**$11,284,700**	**$25,246,460**
Total Development Costs/Rentable Sq. Ft.	*$441*	*$429*	*$302*	*$338*
Development Feasibility				
Gross Rent (100% Occupancy)	$6,962,000	$8,376,000	$1,309,000	$2,652,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,613,900**	**$7,957,200**	**$1,243,600**	**$2,519,400**
Operating Expenses	$2,528,000	$3,051,000	$524,000	$1,046,000
Net Operating Income	**$4,085,900**	**$4,906,200**	**$719,600**	**$1,473,400**
Return on Investment (Cash-on-Cash)	**5.0%**	**5.1%**	**6.4%**	**5.8%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-41. Expansion and Renovation of Office Building, Friendship Heights				
	Class C Building		Class A Building	
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Site Coverage	95%	95%	95%	95%
Existing Building (Gross Square Feet)	166,000	166,000	166,000	166,000
Existing Height (Stories)	8	8	8	8
Existing Floorplate (Square Feet)	20,750	20,750	20,750	20,750
Height (Feet)	130	160	130	160
Additional Stories	2	4	2	4
Future Gross Square Feet	207,500	249,000	41,500	83,000
Existing Gross Square Feet	166,000	166,000	-	-
New Gross Square Feet	41,500	83,000	41,500	83,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.8	0.7	0.8	0.7
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	186,800	224,100	37,400	74,700
Office	180,600	217,900	37,400	74,700
Retail	6,200	6,200	-	-
Operating Inputs				
Office Rent (Full Service)	$45.00	$45.70	$45.00	$45.70
Retail Rent (NNN)	$50.00	$50.00	$50.00	$50.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$18.00	$18.00	$18.00	$18.00
Development Costs				
Building Acquisition	$59,926,000	$59,926,000	$0	$0
Construction Costs for Additional Floors	$5,976,000	$14,525,000	$5,976,000	$14,525,000
Renovation Costs for Existing Space	$16,600,000	$16,600,000	$0	$0
Lost Rent During Construction (10% for 12 months)			$644,400	$654,424
Site Improvement/Infrastructure Costs	$249,000	$332,000	$249,000	$332,000
Demolition Costs	$0	$0	$0	$0
Parking Construction Costs	$0	$0	$0	$0
Soft Costs	$9,130,000	$12,582,800	$2,747,800	$6,204,600
Office Tenant Improvement Costs	$10,836,000	$13,074,000	$2,241,000	$4,482,000
Retail Tenant Improvement Costs	$403,000	$403,000	$0	$0
Total Development Costs	**$103,120,000**	**$117,442,800**	**$11,858,200**	**$26,198,024**
Total Development Costs/Rentable Sq. Ft.	*$552*	*$524*	*$317*	*$351*
Development Feasibility				
Gross Rent (100% Occupancy)	$8,923,000	$10,754,000	$1,683,000	$3,414,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$8,476,900**	**$10,216,300**	**$1,598,900**	**$3,243,300**
Operating Expenses	$3,251,000	$3,922,000	$673,000	$1,345,000
Net Operating Income	**$5,225,900**	**$6,294,300**	**$925,900**	**$1,898,300**
Return on Investment (Cash-on-Cash)	**5.1%**	**5.4%**	**7.8%**	**7.2%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-42. Expansion and Renovation of Office Building, IntelSat				
	Class C Building		Class A Building	
Characteristics of Project				
Site Size (Acres)	0.50	0.50	0.50	0.50
Site Coverage	95%	95%	95%	95%
Existing Building (Gross Square Feet)	166,000	166,000	166,000	166,000
Existing Height (Stories)	8	8	8	8
Existing Floorplate (Square Feet)	20,750	20,750	20,750	20,750
Height (Feet)	130	160	130	160
Additional Stories	2	4	2	4
Future Gross Square Feet	207,500	249,000	41,500	83,000
Existing Gross Square Feet	166,000	166,000	-	-
New Gross Square Feet	41,500	83,000	41,500	83,000
Parking Ratio (Spaces per 1,000 Sq. Ft.)	0.8	0.7	0.8	0.7
Parking Spaces	162	162	162	162
Below Ground (1-2 Levels)	108	108	108	108
Below Ground (3rd Level)	54	54	54	54
Total Rentable Square Feet	186,800	224,100	37,400	74,700
Office	180,600	217,900	37,400	74,700
Retail	6,200	6,200	-	-
Operating Inputs				
Office Rent (Full Service)	$40.00	$40.60	$40.00	$40.60
Retail Rent (NNN)	$35.00	$35.00	$35.00	$35.00
Monthly Parking Rate	$250	$250	$250	$250
Office Operating Expense per Sq. Ft.	$17.00	$17.00	$17.00	$17.00
Development Costs				
Building Acquisition	$47,310,000	$47,310,000	$0	$0
Construction Costs for Additional Floors	$5,976,000	$14,525,000	$5,976,000	$14,525,000
Renovation Costs for Existing Space	$16,600,000	$16,600,000	$0	$0
Lost Rent During Construction (10% for 12 months)			$572,800	$581,392
Site Improvement/Infrastructure Costs	$249,000	$332,000	$249,000	$332,000
Demolition Costs	$0	$0	$0	$0
Parking Construction Costs	$0	$0	$0	$0
Soft Costs	$9,130,000	$12,582,800	$2,719,100	$6,175,400
Office Tenant Improvement Costs	$9,933,000	$11,985,000	$2,054,000	$4,109,000
Retail Tenant Improvement Costs	$372,000	$372,000	$0	$0
Total Development Costs	**$89,570,000**	**$103,706,800**	**$11,570,900**	**$25,722,792**
Total Development Costs/Rentable Sq. Ft.	*$479*	*$463*	*$309*	*$344*
Development Feasibility				
Gross Rent (100% Occupancy)	$7,927,000	$9,550,000	$1,496,000	$3,033,000
Vacancy and Collection Loss	5.0%	5.0%	5.0%	5.0%
Gross Scheduled Rent	**$7,530,700**	**$9,072,500**	**$1,421,200**	**$2,881,400**
Operating Expenses	$3,070,000	$3,704,000	$636,000	$1,270,000
Net Operating Income	**$4,460,700**	**$5,368,500**	**$785,200**	**$1,611,400**
Return on Investment (Cash-on-Cash)	**5.0%**	**5.2%**	**6.8%**	**6.3%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

PES Partners for Economic Solutions

Table C-43. Apartment Renovation with Additional Floors, West End, 22nd at M Street, NW							
	Class C Building					Class A Building	
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Site Coverage Ratio	85%				85%	85%	85%
Existing Structure (Gross Square Feet)	185,000				185,000	185,000	185,000
Existing Height (Stories)	10				10	10	10
Existing Floorplate (Square Feet)	18,500				18,500	18,500	18,500
Height (Feet)	130				160	130	160
Additional Stories	2				4	2	4
Units per Floor	20				20	20	20
Future Project Size (Units)	220				260	40	80
Existing Project Size (Units)	180				180	-	-
New Units	40				80	40	80
Market-Rate Units	216				253	36	73
Affordable Units	4				7	4	7
Parking Ratio (Spaces per Unit)	0.7				0.6	0.7	0.6
Residential Parking Spaces	162				162	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	54				54	54	54
Total Residential Rentable Square Feet	183,800				217,300	32,500	66,900
First-Floor Space Rented	5,600				5,600	-	-
Common Area	39,000				44,900	5,700	11,800
Total Gross Square Feet	222,800				262,200	38,200	78,700
Average Unit Size (Square Feet)	835				836	813	836
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	33	$2,125	38	6	11
1 BR	750	45%	97	$2,865	114	18	33
2 BR	1,050	38%	82	$3,910	96	13	27
3 BR	1,250	2%	4	$4,415	5	(1)	2
Average Market-Rate Monthly Rent	$3,177				$3,203	$3,216	$3,428
Affordable Units							
Efficiency	495	15%	-	$1,393	1	-	1
1 BR	750	45%	2	$1,547	3	2	3
2 BR	1,050	38%	2	$1,717	3	2	3
3 BR	1,250	2%	-	$2,090	-	-	-
Average Affordable Monthly Rent	$1,632				$1,598	$1,632	$1,598
Average Monthly Rent	$3,150				$3,140	$3,057	$3,268
Rent Premium for Additional Floors	0.0%				0.7%	3.0%	5.0%
First-Floor Commercial Rent	$45				$45	$45	$45
Monthly Parking Rate	$250				$250	$250	$250
Operating Expense per Unit	$8.00				$8.00	$8.00	$8.00
Development Costs							
Building Acquisition	$60,840,000				$60,840,000	$0	$0
Construction Costs for Additional Floors	$5,883,000				$14,060,000	$5,883,000	$14,060,000
Renovation Costs for Existing Space	$20,350,000				$20,350,000	$0	$0
Lost Rent During Construction (10% for 12 months)	$0				$0	$648,000	$648,000
Site Improvement/Infrastructure Costs	$222,000				$296,000	$222,000	$296,000
Demolition Costs	$0				$0	$0	$0
Parking Construction Costs	$0				$0	$0	$0
Soft Costs	$9,259,000				$12,147,000	$2,364,000	$5,251,000
Commercial Tenant Improv. Costs	$364,000				$364,000	$0	$0
Total Development Costs	**$96,918,000**				**$108,057,000**	**$9,117,000**	**$20,255,000**
Total Development Costs/Unit	*$440,500*				*$415,600*	*$227,900*	*$253,200*
Development Feasibility							
Gross Rent (100% Occupancy)	$9,052,100				$10,598,300	$1,447,000	$3,061,500
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$8,599,500**				**$10,068,400**	**$1,374,700**	**$2,908,400**
Operating Expenses	$1,470,400				$1,738,400	$260,000	$535,200
Replacement Reserves	$77,000				$91,000	$14,000	$28,000
Net Operating Income	**$7,052,100**				**$8,239,000**	**$1,100,700**	**$2,345,200**
Return on Investment (Cash-on-Cash)	**7.3%**				**7.6%**	**12.1%**	**11.6%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-44. Apartment Renovation with Additional Floors, NoMa							
	Class C Building					Class A Building	
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Site Coverage Ratio	85%				85%	85%	85%
Existing Structure (Gross Square Feet)	185,000				185,000	185,000	185,000
Existing Height (Stories)	10				10	10	10
Existing Floorplate (Square Feet)	18,500				18,500	18,500	18,500
Height (Feet)	130				160	130	160
Additional Stories	2				4	2	4
Units per Floor	20				20	20	20
Future Project Size (Units)	220				260	40	80
Existing Project Size (Units)	180				180	-	-
New Units	40				80	40	80
Market-Rate Units	216				253	36	73
Affordable Units	4				7	4	7
Parking Ratio (Spaces per Unit)	0.7				0.6	0.7	0.6
Residential Parking Spaces	162				162	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	54				54	54	54
Total Residential Rentable Square Feet	183,800				217,300	32,500	66,900
First-Floor Space Rented	5,600				5,600	-	-
Common Area	39,000				44,900	5,700	11,800
Total Gross Square Feet	222,800				262,200	38,200	78,700
Average Unit Size (Square Feet)	835				836	813	836
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	33	$1,680	38	6	11
1 BR	750	45%	97	$2,420	114	18	33
2 BR	1,050	38%	82	$3,190	96	13	27
3 BR	1,250	2%	4	$3,555	5	(1)	2
Average Market-Rate Monthly Rent	$2,620				$2,642	$2,658	$2,828
Affordable Units							
Efficiency	495	15%	-	$1,393	1	-	1
1 BR	750	45%	2	$1,547	3	2	3
2 BR	1,050	38%	2	$1,717	3	2	3
3 BR	1,250	2%	-	$2,090	-	-	-
Average Affordable Monthly Rent	$1,632				$1,598	$1,632	$1,598
Average Monthly Rent	$2,600				$2,600	$2,556	$2,720
Rent Premium for Additional Floors	0.0%				0.7%	3.0%	5.0%
First-Floor Commercial Rent	$45				$45	$45	$45
Monthly Parking Rate	$250				$250	$250	$250
Operating Expense per Unit	$7.25				$7.25	$7.25	$7.25
Development Costs							
Building Acquisition	$64,080,000				$64,080,000	$0	$0
Construction Costs for Additional Floors	$5,883,000				$14,060,000	$5,883,000	$14,060,000
Renovation Costs for Existing Space	$20,350,000				$20,350,000	$0	$0
Lost Rent During Construction (10% for 12 months)	$0				$0	$518,000	$518,000
Site Improvement/Infrastructure Costs	$222,000				$296,000	$222,000	$296,000
Demolition Costs	$0				$0	$0	$0
Parking Construction Costs	$0				$0	$0	$0
Soft Costs	$9,259,000				$12,147,000	$2,318,000	$5,206,000
Commercial Tenant Improv. Costs	$392,000				$392,000	$0	$0
Total Development Costs	**$100,186,000**				**$111,325,000**	**$8,941,000**	**$20,080,000**
Total Development Costs/Unit	*$455,400*				*$428,200*	*$223,500*	*$251,000*
Development Feasibility							
Gross Rent (100% Occupancy)	$7,608,100				$8,893,700	$1,210,000	$2,548,100
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$7,227,700**				**$8,449,000**	**$1,149,500**	**$2,420,700**
Operating Expenses	$1,332,600				$1,575,400	$235,600	$485,000
Replacement Reserves	$77,000				$91,000	$14,000	$28,000
Net Operating Income	**$5,818,100**				**$6,782,600**	**$899,900**	**$1,907,700**
Return on Investment (Cash-on-Cash)	**5.8%**				**6.1%**	**10.1%**	**9.5%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-45. Apartment Renovation with Additional Floors, 5th at K Street, NW							
	Class C Building					Class A Building	
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Site Coverage Ratio	85%				85%	85%	85%
Existing Structure (Gross Square Feet)	185,000				185,000	185,000	185,000
Existing Height (Stories)	10				10	10	10
Existing Floorplate (Square Feet)	18,500				18,500	18,500	18,500
Height (Feet)	130				160	130	160
Additional Stories	2				4	2	4
Units per Floor	20				20	20	20
Future Project Size (Units)	220				260	40	80
Existing Project Size (Units)	180				180	-	-
New Units	40				80	40	80
Market-Rate Units	216				253	36	73
Affordable Units	4				7	4	7
Parking Ratio (Spaces per Unit)	0.7				0.6	0.7	0.6
Residential Parking Spaces	162				162	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	54				54	54	54
Total Residential Rentable Square Feet	183,800				217,300	32,500	66,900
First-Floor Space Rented	5,600				5,600	-	-
Common Area	39,000				44,900	5,700	11,800
Total Gross Square Feet	222,800				262,200	38,200	78,700
Average Unit Size (Square Feet)	835				836	813	836
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	33	$1,550	38	6	11
1 BR	750	45%	97	$2,205	114	18	33
2 BR	1,050	38%	82	$2,890	96	13	27
3 BR	1,250	2%	4	$3,200	5	(1)	2
Average Market-Rate Monthly Rent	$2,383				$2,403	$2,421	$2,571
Affordable Units							
Efficiency	495	15%	-	$1,393	1	-	1
1 BR	750	45%	2	$1,547	3	2	3
2 BR	1,050	38%	2	$1,717	3	2	3
3 BR	1,250	2%	-	$2,090	-	-	-
Average Affordable Monthly Rent	$1,632				$1,598	$1,632	$1,598
Average Monthly Rent	$2,370				$2,360	$2,342	$2,486
Rent Premium for Additional Floors	0.0%				0.7%	3.0%	5.0%
First-Floor Commercial Rent	$45				$45	$45	$45
Monthly Parking Rate	$250				$250	$250	$250
Operating Expense per Unit	$7.00				$7.00	$7.00	$7.00
Development Costs							
Building Acquisition	$45,540,000				$45,540,000	$0	$0
Construction Costs for Additional Floors	$5,883,000				$14,060,000	$5,883,000	$14,060,000
Renovation Costs for Existing Space	$20,350,000				$20,350,000	$0	$0
Lost Rent During Construction (10% for 12 months)	$0				$0	$562,000	$562,000
Site Improvement/Infrastructure Costs	$222,000				$296,000	$222,000	$296,000
Demolition Costs	$0				$0	$0	$0
Parking Construction Costs	$0				$0	$0	$0
Soft Costs	$9,259,000				$12,147,000	$2,333,000	$5,221,000
Commercial Tenant Improv. Costs	$364,000				$364,000	$0	$0
Total Development Costs	**$81,618,000**				**$92,757,000**	**$9,000,000**	**$20,139,000**
Total Development Costs/Unit	*$371,000*				*$356,800*	*$225,000*	*$251,700*
Development Feasibility							
Gross Rent (100% Occupancy)	$6,994,100				$8,168,400	$1,108,700	$2,329,700
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,644,400**				**$7,760,000**	**$1,053,300**	**$2,213,200**
Operating Expenses	$1,286,600				$1,521,100	$227,500	$468,300
Replacement Reserves	$77,000				$91,000	$14,000	$28,000
Net Operating Income	**$5,280,800**				**$6,147,900**	**$811,800**	**$1,716,900**
Return on Investment (Cash-on-Cash)	**6.5%**				**6.6%**	**9.0%**	**8.5%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-46. Apartment Renovation with Additional Floors, L'Enfant Plaza							
	Class C Building					Class A Building	
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Site Coverage Ratio	85%				85%	85%	85%
Existing Structure (Gross Square Feet)	185,000				185,000	185,000	185,000
Existing Height (Stories)	10				10	10	10
Existing Floorplate (Square Feet)	18,500				18,500	18,500	18,500
Height (Feet)	130				160	130	160
Additional Stories	2				4	2	4
Units per Floor	20				20	20	20
Future Project Size (Units)	220				260	40	80
Existing Project Size (Units)	180				180	-	-
New Units	40				80	40	80
Market-Rate Units	216				253	36	73
Affordable Units	4				7	4	7
Parking Ratio (Spaces per Unit)	0.7				0.6	0.7	0.6
Residential Parking Spaces	162				162	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	54				54	54	54
Total Residential Rentable Square Feet	183,800				217,300	32,500	66,900
First-Floor Space Rented	5,600				5,600	-	-
Common Area	39,000				44,900	5,700	11,800
Total Gross Square Feet	222,800				262,200	38,200	78,700
Average Unit Size (Square Feet)	835				836	813	836
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	33	$1,360	38	6	11
1 BR	750	45%	97	$1,920	114	18	33
2 BR	1,050	38%	82	$2,490	96	13	27
3 BR	1,250	2%	4	$2,730	5	(1)	2
Average Market-Rate Monthly Rent	$2,066				$2,083	$2,101	$2,228
Affordable Units							
Efficiency	495	15%	-	$1,393	1	-	1
1 BR	750	45%	2	$1,547	3	2	3
2 BR	1,050	38%	2	$1,717	3	2	3
3 BR	1,250	2%	-	$2,090	-	-	-
Average Affordable Monthly Rent	$1,632				$1,598	$1,632	$1,598
Average Monthly Rent	$2,060				$2,060	$2,054	$2,173
Rent Premium for Additional Floors	0.0%				0.7%	3.0%	5.0%
First-Floor Commercial Rent	$45				$45	$45	$45
Monthly Parking Rate	$250				$250	$250	$250
Operating Expense per Unit	$6.50				$6.50	$6.50	$6.50
Development Costs							
Building Acquisition	$39,600,000				$39,600,000	$0	$0
Construction Costs for Additional Floors	$5,883,000				$14,060,000	$5,883,000	$14,060,000
Renovation Costs for Existing Space	$20,350,000				$20,350,000	$0	$0
Lost Rent During Construction (10% for 12 months)	$0				$0	$475,000	$475,000
Site Improvement/Infrastructure Costs	$222,000				$296,000	$222,000	$296,000
Demolition Costs	$0				$0	$0	$0
Parking Construction Costs	$0				$0	$0	$0
Soft Costs	$9,259,000				$12,147,000	$2,303,000	$5,191,000
Commercial Tenant Improv. Costs	$392,000				$392,000	$0	$0
Total Development Costs	**$75,706,000**				**$86,845,000**	**$8,883,000**	**$20,022,000**
Total Development Costs/Unit	*$344,100*				*$334,000*	*$222,100*	*$250,300*
Development Feasibility							
Gross Rent (100% Occupancy)	$6,171,000				$7,196,100	$972,700	$2,036,900
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$5,862,500**				**$6,836,300**	**$924,100**	**$1,935,100**
Operating Expenses	$1,194,700				$1,412,500	$211,300	$434,900
Replacement Reserves	$77,000				$91,000	$14,000	$28,000
Net Operating Income	**$4,590,800**				**$5,332,800**	**$698,800**	**$1,472,200**
Return on Investment (Cash-on-Cash)	**6.1%**				**6.1%**	**7.9%**	**7.4%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-47. Apartment Renovation with Additional Floors, Federal Center SW							
	Class C Building					Class A Building	
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Site Coverage Ratio	85%				85%	85%	85%
Existing Structure (Gross Square Feet)	185,000				185,000	185,000	185,000
Existing Height (Stories)	10				10	10	10
Existing Floorplate (Square Feet)	18,500				18,500	18,500	18,500
Height (Feet)	130				160	130	160
Additional Stories	2				4	2	4
Units per Floor	20				20	20	20
Future Project Size (Units)	220				260	40	80
Existing Project Size (Units)	180				180	-	-
New Units	40				80	40	80
Market-Rate Units	216				253	36	73
Affordable Units	4				7	4	7
Parking Ratio (Spaces per Unit)	0.7				0.6	0.7	0.6
Residential Parking Spaces	162				162	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	54				54	54	54
Total Residential Rentable Square Feet	183,800				217,300	32,500	66,900
First-Floor Space Rented	5,600				5,600	-	-
Common Area	39,000				44,900	5,700	11,800
Total Gross Square Feet	222,800				262,200	38,200	78,700
Average Unit Size (Square Feet)	835				836	813	836
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	33	$1,310	38	6	11
1 BR	750	45%	97	$1,850	114	18	33
2 BR	1,050	38%	82	$2,390	96	13	27
3 BR	1,250	2%	4	$2,605	5	(1)	2
Average Market-Rate Monthly Rent	$1,986				$2,003	$2,022	$2,143
Affordable Units							
Efficiency	495	15%	-	$1,393	1	-	1
1 BR	750	45%	2	$1,547	3	2	3
2 BR	1,050	38%	2	$1,717	3	2	3
3 BR	1,250	2%	-	$2,090	-	-	-
Average Affordable Monthly Rent	$1,632				$1,598	$1,632	$1,598
Average Monthly Rent	$1,980				$1,980	$1,983	$2,095
Rent Premium for Additional Floors	0.0%				0.7%	3.0%	5.0%
First-Floor Commercial Rent	$45				$45	$45	$45
Monthly Parking Rate	$250				$250	$250	$250
Operating Expense per Unit	$6.25				$6.25	$6.25	$6.25
Development Costs							
Building Acquisition	$36,000,000				$36,000,000	$0	$0
Construction Costs for Additional Floors	$5,883,000				$14,060,000	$5,883,000	$14,060,000
Renovation Costs for Existing Space	$20,350,000				$20,350,000	$0	$0
Lost Rent During Construction (10% for 12 months)	$0				$0	$454,000	$454,000
Site Improvement/Infrastructure Costs	$222,000				$296,000	$222,000	$296,000
Demolition Costs	$0				$0	$0	$0
Parking Construction Costs	$0				$0	$0	$0
Soft Costs	$9,259,000				$12,147,000	$2,296,000	$5,184,000
Commercial Tenant Improv. Costs	$392,000				$392,000	$0	$0
Total Development Costs	**$72,106,000**				**$83,245,000**	**$8,855,000**	**$19,994,000**
Total Development Costs/Unit	*$327,800*				*$320,200*	*$221,400*	*$249,900*
Development Feasibility							
Gross Rent (100% Occupancy)	$5,965,300				$6,953,200	$938,900	$1,963,700
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$5,667,000**				**$6,605,500**	**$892,000**	**$1,865,500**
Operating Expenses	$1,148,800				$1,358,100	$203,100	$418,100
Replacement Reserves	$77,000				$91,000	$14,000	$28,000
Net Operating Income	**$4,441,200**				**$5,156,400**	**$674,900**	**$1,419,400**
Return on Investment (Cash-on-Cash)	**6.2%**				**6.2%**	**7.6%**	**7.1%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-48. Apartment Renovation with Additional Floors, Waterfront Station							
	Class C Building					Class A Building	
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Site Coverage Ratio	85%				85%	85%	85%
Existing Structure (Gross Square Feet)	185,000				185,000	185,000	185,000
Existing Height (Stories)	10				10	10	10
Existing Floorplate (Square Feet)	18,500				18,500	18,500	18,500
Height (Feet)	130				160	130	160
Additional Stories	2				4	2	4
Units per Floor	20				20	20	20
Future Project Size (Units)	220				260	40	80
Existing Project Size (Units)	180				180	-	-
New Units	40				80	40	80
Market-Rate Units	216				253	36	73
Affordable Units	4				7	4	7
Parking Ratio (Spaces per Unit)	0.7				0.6	0.7	0.6
Residential Parking Spaces	162				162	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	54				54	54	54
Total Residential Rentable Square Feet	183,800				217,300	32,500	66,900
First-Floor Space Rented	5,600				5,600	-	-
Common Area	39,000				44,900	5,700	11,800
Total Gross Square Feet	222,800				262,200	38,200	78,700
Average Unit Size (Square Feet)	835				836	813	836
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	33	$1,405	38	6	11
1 BR	750	45%	97	$1,990	114	18	33
2 BR	1,050	38%	82	$2,590	96	13	27
3 BR	1,250	2%	4	$2,845	5	(1)	2
Average Market-Rate Monthly Rent	$2,144				$2,162	$2,179	$2,313
Affordable Units							
Efficiency	495	15%	-	$1,393	1	-	1
1 BR	750	45%	2	$1,547	3	2	3
2 BR	1,050	38%	2	$1,717	3	2	3
3 BR	1,250	2%	-	$2,090	-	-	-
Average Affordable Monthly Rent	$1,632				$1,598	$1,632	$1,598
Average Monthly Rent	$2,130				$2,130	$2,125	$2,251
Rent Premium for Additional Floors	0.0%				0.7%	3.0%	5.0%
First-Floor Commercial Rent	$45				$45	$45	$45
Monthly Parking Rate	$250				$250	$250	$250
Operating Expense per Unit	$6.75				$6.75	$6.75	$6.75
Development Costs							
Building Acquisition	$43,200,000				$43,200,000	$0	$0
Construction Costs for Additional Floors	$5,883,000				$14,060,000	$5,883,000	$14,060,000
Renovation Costs for Existing Space	$20,350,000				$20,350,000	$0	$0
Lost Rent During Construction (10% for 12 months)	$0				$0	$497,000	$497,000
Site Improvement/Infrastructure Costs	$222,000				$296,000	$222,000	$296,000
Demolition Costs	$0				$0	$0	$0
Parking Construction Costs	$0				$0	$0	$0
Soft Costs	$9,259,000				$12,147,000	$2,311,000	$5,199,000
Commercial Tenant Improv. Costs	$280,000				$280,000	$0	$0
Total Development Costs	**$79,194,000**				**$90,333,000**	**$8,913,000**	**$20,052,000**
Total Development Costs/Unit	*$360,000*				*$347,400*	*$222,800*	*$250,700*
Development Feasibility							
Gross Rent (100% Occupancy)	$6,374,200				$7,436,200	$1,006,300	$2,109,200
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,055,500**				**$7,064,400**	**$956,000**	**$2,003,700**
Operating Expenses	$1,240,700				$1,466,800	$219,400	$451,600
Replacement Reserves	$77,000				$91,000	$14,000	$28,000
Net Operating Income	**$4,737,800**				**$5,506,600**	**$722,600**	**$1,524,100**
Return on Investment (Cash-on-Cash)	**6.0%**				**6.1%**	**8.1%**	**7.6%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

PES Partners for Economic Solutions

Table C-49. Apartment Renovation with Additional Floors, IntelSat							
	Class C Building					Class A Building	
Characteristics of Project							
Site Size (Acres)	0.50				0.50	0.50	0.50
Site Coverage Ratio	85%				85%	85%	85%
Existing Structure (Gross Square Feet)	185,000				185,000	185,000	185,000
Existing Height (Stories)	10				10	10	10
Existing Floorplate (Square Feet)	18,500				18,500	18,500	18,500
Height (Feet)	130				160	130	160
Additional Stories	2				4	2	4
Units per Floor	20				20	20	20
Future Project Size (Units)	220				260	40	80
Existing Project Size (Units)	180				180	-	-
New Units	40				80	40	80
Market-Rate Units	216				253	36	73
Affordable Units	4				7	4	7
Parking Ratio (Spaces per Unit)	0.7				0.6	0.7	0.6
Residential Parking Spaces	162				162	162	162
Below Ground (1-2 Levels)	108				108	108	108
Below Ground (3rd Level)	54				54	54	54
Total Residential Rentable Square Feet	183,800				217,300	32,500	66,900
First-Floor Space Rented	5,600				5,600	-	-
Common Area	39,000				44,900	5,700	11,800
Total Gross Square Feet	222,800				262,200	38,200	78,700
Average Unit Size (Square Feet)	835				836	813	836
Unit Mix	**Sq. Ft.**	**Mix**	**Units**	**Rent**	**Units**	**Units**	**Units**
Market-Rate Units							
Efficiency	495	15%	33	$1,595	38	6	11
1 BR	750	45%	97	$2,275	114	18	33
2 BR	1,050	38%	82	$2,990	96	13	27
3 BR	1,250	2%	4	$3,320	5	(1)	2
Average Market-Rate Monthly Rent	$2,462				$2,482	$2,499	$2,657
Affordable Units							
Efficiency	495	15%	-	$1,393	1	-	1
1 BR	750	45%	2	$1,547	3	2	3
2 BR	1,050	38%	2	$1,717	3	2	3
3 BR	1,250	2%	-	$2,090	-	-	-
Average Affordable Monthly Rent	$1,632				$1,598	$1,632	$1,598
Average Monthly Rent	$2,450				$2,440	$2,412	$2,564
Rent Premium for Additional Floors	0.0%				0.7%	3.0%	5.0%
First-Floor Commercial Rent	$45				$45	$45	$45
Monthly Parking Rate	$250				$250	$250	$250
Operating Expense per Unit	$7.25				$7.25	$7.25	$7.25
Development Costs							
Building Acquisition	$67,680,000				$67,680,000	$0	$0
Construction Costs for Additional Floors	$5,883,000				$14,060,000	$5,883,000	$14,060,000
Renovation Costs for Existing Space	$20,350,000				$20,350,000	$0	$0
Lost Rent During Construction (10% for 12 months)	$0				$0	$583,000	$583,000
Site Improvement/Infrastructure Costs	$222,000				$296,000	$222,000	$296,000
Demolition Costs	$0				$0	$0	$0
Parking Construction Costs	$0				$0	$0	$0
Soft Costs	$9,259,000				$12,147,000	$2,341,000	$5,229,000
Commercial Tenant Improv. Costs	$336,000				$336,000	$0	$0
Total Development Costs	**$103,730,000**				**$114,869,000**	**$9,029,000**	**$20,168,000**
Total Development Costs/Unit	*$471,500*				*$441,800*	*$225,700*	*$252,100*
Development Feasibility							
Gross Rent (100% Occupancy)	$7,197,600				$8,408,700	$1,142,200	$2,402,100
Vacancy and Collection Loss	5.0%				5.0%	5.0%	5.0%
Gross Scheduled Rent	**$6,837,700**				**$7,988,300**	**$1,085,100**	**$2,282,000**
Operating Expenses	$1,332,600				$1,575,400	$235,600	$485,000
Replacement Reserves	$77,000				$91,000	$14,000	$28,000
Net Operating Income	**$5,428,100**				**$6,321,900**	**$835,500**	**$1,769,000**
Return on Investment (Cash-on-Cash)	**5.2%**				**5.5%**	**9.3%**	**8.8%**

Source: Structura, Inc.; James G. Davis Construction Corporation; Partners for Economic Solutions, 2013.

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Table C-50. District and Metropolitan Washington Office Construction and Absorption Trends, 1993-2012						
					DC Share of Metro	
Year	DC Construction	DC Net Absorption	Metro Construction	Metro Net Absorption	Construction	Net Absorption
2012	199,603	1,449,112	1,737,467	496,388	11.5%	288.9%
2011	437,903	934,093	1,824,001	799,263	24.0%	117.0%
2010	2,552,698	3,181,102	4,368,542	4,768,516	58.4%	66.7%
2009	2,963,858	(891,042)	7,126,026	(790,197)	41.6%	112.9%
2008	1,054,751	249,154	9,172,717	1,166,166	11.5%	21.4%
2007	2,987,484	675,970	10,328,842	2,995,730	28.9%	22.6%
2006	2,856,410	2,180,954	11,625,194	9,285,416	24.6%	23.6%
2005	3,440,016	4,460,648	6,757,214	13,253,602	50.9%	33.7%
2004	1,517,812	1,342,831	7,311,121	10,465,595	20.8%	12.8%
2003	1,448,746	1,784,065	5,914,210	8,519,358	24.5%	20.9%
2002	725,090	(798,311)	10,516,466	1,555,448	6.9%	-51.1%
2001	3,459,055	1,780,469	15,142,950	(2,077,135)	22.8%	-85.8%
2000	845,990	2,038,880	12,337,955	10,690,758	6.9%	19.1%
1999	86,573	864,561	11,354,499	12,247,961	0.8%	7.1%
1998	(128,430)	2,293,795	4,540,536	8,602,917	-2.8%	26.7%
1997	861,738	2,943,973	1,749,124	7,259,271	49.3%	40.6%
1996	1,066,717	1,699,693	4,427,659	9,863,556	24.1%	17.2%
1995	41,269	844,988	903,326	5,547,073	4.6%	15.2%
1994	640,359	2,312,258	2,393,147	8,292,725	26.8%	27.9%
1993	NA	NA	NA	NA	NA	-4.1%

Source: CoStar; Partners for Economic Solutions, 2013.

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Appendix D. Fiscal Impact Analysis Assumptions

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Table D-1. Tax Rates and Assumptions in Fiscal Year 2013

Employees			
Office	180	sq. ft./employee	
Retail	400	sq. ft./employee	
Residential	50	d.u./employee	
Average Salaries			
Retail	$29,400		2012 BLS Median for all Cashiers and Retail Salespersons in DC + 2% to 2013 dollars
Residential	$29,300		2012 BLS Median for building/grounds cleaning/maintenance + 2% to 2013 dollars
Office	$77,500		2012 BLS Median for all occupations + 2% to 2013 dollars
Real Property Tax			
Residential	$0.85	per $100 of assessed value	
Commercial	$1.85	per $100 of assessed value	
Homestead Exemption	$60,000		
Sales Tax			
Groceries, Drugs	Exempt		
Retail Goods	6.00%		
Eating and Drinking	9.0%		+1% for WCCA
Construction Materials	6.00%		
Blended Sales Tax Rate			
Construction Workers	5.1%		30% eating and drinking; 40% other retail; 20% non-taxable
Residents	5.3%		25% eating and drinking; 50% other retail; 25% non-taxable
On-Site Retailers Except Grocery and Drugstore	6.9%		30% eating and drinking; 70% other retail
On-Site Retailers -- Drugstore	1.8%		
Taxable Percent of Drugstore Sales	30%		
On-Site Retailers -- Grocery Store	0.9%		
Taxable Percent of Grocery Store Sales	15%		
Project Employees	6.0%		40% eating and drinking; 40% other retail; 20% non-taxable
Share of Hard Construction Cost to Materials	60%		
Construction Worker Spending in DC	$1,500		
Office Worker Spending in DC	$2,500		
Project Employee Spending in DC	$1,500		
Share of Employee DC Spending Outside Project	30%		

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Table D-1. Tax Rates and Assumptions in Fiscal Year 2013 (Continued)		
Sales per Square Foot		
Grocery Store	$580	$s and Cents of Shopping Centers, 2004, Neighborhood Center Supermarkets (ave. of median and top 10%) + 20% for 2013 dollars
Drugstore	$490	$s and Cents of Shopping Centers, 2004, Neighborhood Center Drugstores+ 20% for 2013 dollars
Other Retail Space	$300	
Retail Vacancy Rate	5%	
Share of Income to Retail Sales	19%	from BLS Consumer Expenditure Survey for DC Metro Area
Share of Retail Spending in DC	40%	
Share of DC Spending Outside the Project	98%	
Income Tax		
Personal Exemption, Standard Deduction	$5,675	
Base Over $10,000	$400	
Percent From $10,000 to $40,000	6.0%	
Base Over $40,000	$2,200	
Percent Over $40,000	8.5%	
Base Over $350,000	$28,550	
Percent Over $350,000	8.95%	
Market-Rate Resident Income	$135,000	Only 9.5% of DC renters have a higher income
Market-Rate Resident Income Taxes	$9,793	
Affordable Unit Resident Income	$69,500	Two-person household at 80%
Affordable Unit Resident Income Taxes	$4,225	
Average Resident Income Taxes	$9,348	
Percent of Units Occupied by Year-Round Residents	90%	
Percent of Units Occupied by Workers Employed in New Higher-Rise Buildings	5%	
Average Retail Worker Income Taxes	$1,224	
Average Residential Mgt Worker Income Taxes	$1,218	
Average Office Worker Income Taxes	$4,905	

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