COLUMBIA PIKE TRANSIT INITIATIVE

Return on Investment Study

July 2012

PIKE TRANSIT INITIATIVE

Table of Contents

List of Tables

List of Figures

List of Acronyms

ROI	Return on Investment
WMATA	Washington Metropolitan Area Transit Authority
AA	Alternatives Analysis
EA	Environmental Assessment
FTA	Federal Transit Administration
MARKS	Market Affordable Units
CAF	Committed Affordable Units
AMI	Area Median Income
TOD	Transit-Oriented Development
FBC	Form Based Code
MWCOG	Metropolitan Washington Council of Governments
LOS	Level of Service

TCRP	Transit Cooperative Research Program
VDOT	Virginia Department of Transportation
SF	Square Feet
ADU	Accessory Dwelling Units

Acknowledgements

The authors would like to thank the advisory groups from Arlington and Fairfax Counties who reviewed and provided the background project documents and data, provided contact information for developers and other local stakeholders, and assisted with interviews and the workshop. The data and reports were the central inputs to the project. Thanks also to John Dittmeier from the Washington Metropolitan Area Planning Authority (WMATA) for his guidance with the Columbia Pike Transit Initiative. Table 0-1 lists the staff members involved in the study.

In addition, the community volunteers who gave their time and energy to complete the survey provided valuable insight through interviews and at the workshop. Their comments resulted in greater understanding into the nature and character of the corridor and the associated development potential. We appreciate that they shared their time and insight and the study is better for their contributions. The workshop and interview participants are listed in Table 0-2.

Table 0-1. Columbia Pike Return on Investment County Advisory Groups

Advisory Group		
Name	Title	Department
Arlington County		
Steve Del Giudice	Transit Bureau Chief	Arlington County Department of Environmental Services
Richard Hartman	Transportation Planner	Arlington County Department of Environmental Services
Alex Iams	Commercial Development Planner	Arlington County Department of Economic Development
Roberto Ruiz	Team Leader, Research Team/Urban Planner	Arlington County Department of Community Planning, Housing, & Development
David Cristeal	Housing Development Supervisor	Arlington County Department of Community Planning, Housing, & Development
Dennis Leach	Director of Transportation	Arlington County Department of Environmental Services
Marc McCauley	Real Estate Director	Arlington County Department of Economic Development
Troy Palma	Regional Economist	Arlington County Department of Economic Development
Andrew Wilson	Commercial Development Specialist	Arlington County Department of Economic Development
Jennifer Smith	Principal Planner	Arlington County Department of Community Planning, Housing, & Development
Fairfax County		
Michael Garcia	Transportation Planner	Fairfax County Department of Transportation
Leonard Wolfenstein	Chief, Transportation Planning Section	Fairfax County Department of Transportation
Elizabeth Hagg	Deputy Director	Office of Community Revitalization and Reinvestment
John Payne	Deputy Director	Fairfax County Department of Housing and Community Development
Tim Shirocky	Assistant Director	Fairfax County Department of Tax Administration
Bernard Suchicital	Planner II	Fairfax County Department of Planning & Zoning
Washington Metropolitan Area Planning Authority		
John Dittmeier	Planning Manager, Corridor Planning and Development	WMATA Office of Long Range Planning

Table 0-2. Columbia Pike Return on Investment Community Advisory Groups

Community		
Name	Title	Affiliation
Takis Karantonis	Executive Director	Columbia Pike Revitalization Organization
Dan Lockard	Principal	ARA National Land Services
Interview: Affordable Housing		
Anita Morrison	Principal	Partners for Economic Solutions
Interview: Corridor Developer		
Rod Vosper	Vice President of New Development	Simon Property Group
Mike Novotny	Development Manager	Vornado/Charles E. Smith
Greg Cichy	Skyline Asset Manager	Vornado/Charles E. Smith
Interview: Form Based Code		
Jennifer Smith	Principal Planner	Arlington County Department of Community Planning, Housing, & Development
Steve Del Guidice	Transit Bureau Chief	Arlington County Department of Environmental Services
Developer Workshop Participants		
Stefanie Smith	Project Manager	Elm Street Development
Jim Ponder	Chief Executive Officer	AHC Management
Bob Oliver	Property Manager	Levin Management Corp.
David DeCamp	Managing Member	L2 Partners, LLC
Guy Gotts	Owner's Representative	E.G. Reinsch, Inc.
Gerald Pierce	Owner's Representative	E.G. Reinsch, Inc.
Brian Downie	Vice President of Development	Saul Center
Mike Novotny	Development Manager	Vornado/Charles E. Smith
Matt Weber	Managing Director	NV Commercial
Takis Karantonis	Executive Director	Columbia Pike Revitalization Organization

Executive Summary

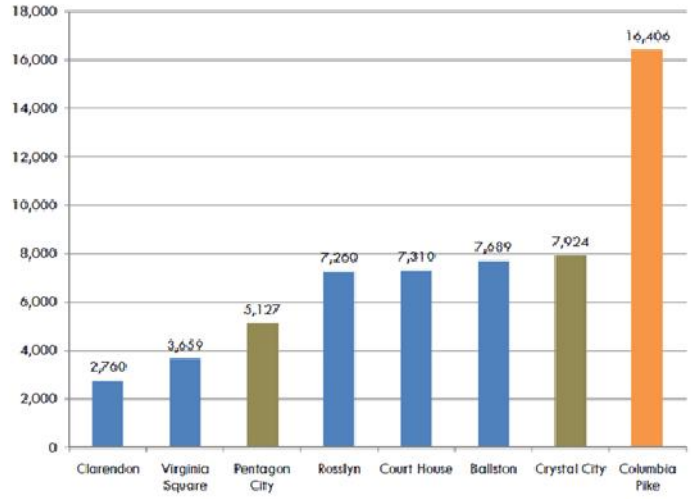
1. Executive Summary

Columbia Pike is a vital corridor that serves as a critical gateway between Northern Virginia and the District of Columbia. Over the past decade the formerly low-density, auto-dependent corridor has been steadily transforming. Arlington and Fairfax Counties have been actively working with the neighborhoods along the corridor to articulate a long-range vision for how they would like this transformation to unfold, and the policies and investments needed to realize their vision. The Columbia Pike Transit Initiative is thus one outcome of a decade's worth of planning work on the part of community residents and county planning staffs.

Columbia Pike has the largest stock of housing in Arlington County (Figure ES-1). While Columbia Pike has significant retail space in its own right, with a terminus at Pentagon City the streetcar route would serve a significant share of Arlington's retail stock as well (Figure ES-2). The segment of the corridor in Fairfax County serves a similar retail and residential role, anchoring the eastern portion of Fairfax County. The private and public investments made over the next ten years are long-term investments that will measurably shape the future of the corridor and the counties for many years beyond.

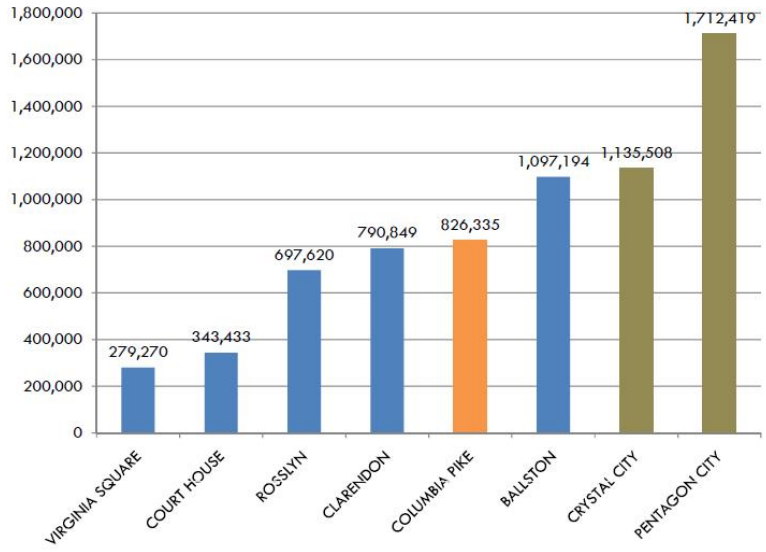
Building on the work of community residents and county staff over the past decade to articulate a vision for their community, the current phase of planning for the corridor's transportation future focuses on environmental analysis and associated engineering work to select the alignment and mode of transit that best meet the community's need and fulfill its vision. Economic analysis in the Alternatives Analysis/Environmental Assessment (AA/EA) and in the anticipated Federal Transit Administration (FTA) New Starts/Small Starts funding application addresses the question of how land values and uses would change with implementation of the Streetcar Build Alternative compared to the other alternatives. Understanding this effect is helpful in evaluating whether to make the investment and in articulating the potential benefits to stakeholders and the general public. In addition, understanding what policies and regulatory changes could be made in concert with the physical infrastructure investment is important to ensure that Arlington County and Fairfax County receive the maximum economic development return on their streetcar investment.

Figure ES-1: Estimated Stock of Residential Units in Arlington County



Source: Arlington County Present and Future, August 2011; Census Bureau, April 2010.

Figure ES-2: Estimated Stock of Retail Square Feet in Arlington County, August 2011



Source: Arlington County Present and Future, August 2011; CPHD, Planning Division, Planning, Research, and Analysis Team (PRAT). As of August 8, 2011.

1.1 Process

The Return on Investment (ROI) Study gathered information through a variety of means, including review and analysis of literature describing how transit investment affects economies, direct analysis of the corridor through analysis of data and planning documents, and interviews with developers and key stakeholders. Thus, the approach builds on past work, and combines data analysis with hands-on experience of "what works" in fostering economic development in order to offer an assessment of the counties' return on their proposed streetcar investment.

Data

Data regarding the current and forecasted population, employment, and household growths were obtained from the Metropolitan Washington Council of Governments (MWCOG) Rounds 8.0 (current) and 8.1 (proposed for adoption) forecasts. Projections of residential unit growth from Arlington County's *Neighborhoods Area Plan* were used to supplement the MWCOG projections. Parcel and property data from the counties' real estate assessments were analyzed to identify property values and the tax base for properties adjacent to the project corridor. The counties provided square footage and unit estimates for current and planned retail, commercial, residential, office, and hotel uses and for remaining development capacity. Travel demand forecasts from the AA/EA document were used to understand how transit ridership could be affected by the new streetcar mode.

Literature Review

The literature describing property market outcomes in other locations was reviewed. Nearly all of the studies reported that streetcar projects in their city had a positive effect on the city's built environment. However, the significance of the effect varied greatly by city, property type, and study area limits (such as adjacent, ¼ mile, etc.). A range of 4 percent to 12 percent for studies estimating the potential impacts of new streetcar service. Areas that were more focused on residential development were in the lower part of that range; areas more concentrated in office development tended to be in the higher part of the 4 to 12 percent range.

Online Survey

An online survey was constructed to determine developers' perceptions regarding economic development activity with and without a transit improvement along the corridor. The survey was designed to understand the developers' assessment of the corridor's market potential. It was distributed to 53 developers in the region who have either previously developed along the corridor or could in the future, depending upon the transit improvements. The survey had a response rate of 41 percent (22 of the 53 surveys were completed). Respondents represented a variety of property types and scales, which provided broad coverage of the development community. The response rate was high enough to offer a representative sample of the developer community, and valuable feedback was obtained, particularly through the comments sections.

Interviews

Four interviews were conducted with two developers, an affordable housing representative, and a planning and zoning expert from Arlington County. The interviewees were selected to ensure that the study considered the perspectives of developers that anchor each end of the corridor, and that the issues, determined to be important to the study area, were discussed. The two developers interviewed included Simon Properties, owners of Pentagon City Mall at the eastern terminus of the corridor, and Vornado/Charles E. Smith, owners of both the Skyline development at the corridor's western terminus, as well as the property of the proposed Operations & Maintenance (O&M) facility in Pentagon City. As Columbia Pike has traditionally been an affordable area for residents, Arlington County has set ambitious goals for retaining the affordable housing stock despite the anticipated new market-rate developments. Understanding how the affordable housing goals will affect development patterns and developer incentives provided by the counties is an important consideration for the study. A similarly important aspect of the corridor's future development outcomes is Arlington County's Form Based Code (FBC). New developments within the nodes of Columbia Pike are encouraged to develop under the FBC; the FBC aims to control the look and size of development, not function. Developers are guaranteed a faster approvals process for following the FBC's guidelines in exchange for a cohesive look and, in select cases, affordable housing or historical property concessions.

Developer Workshop

A developer workshop was held on the morning of April 18, 2012. The purpose of the workshop was to review key survey results, solicit feedback, clarify results, and validate the key findings for outcomes that can be expected with and without transit investments in the corridor. Nine developers (representing a mix of commercial and affordable housing property types) attended the two hour workshop, as well as staff from both counties and the Executive Director of the Columbia Pike Revitalization Organization (CPRO). During the workshop, the developers were asked to provide their opinions on the property premiums; type, quality, timing, and locations of developments; and any county policies or issues that affect how or when development might take place along Columbia Pike and Baileys Crossroads. The guidance provided by the developers at the workshop helped finalize key assumptions applied in the empirical analysis. In particular, the developers narrowed the range of potential impacts identified in the literature review to a range of 4 to 10 percent.

1.2 Return on Investment Study Findings and Recommendations

The streetcar's operation will offer travel cost and time savings to residents and workers in the corridor, as well as improve the accessibility of the community to the larger regional transit network through the connection with Metrorail. Transit's role in connecting residents to nearby and proximate retail and entertainment opportunities (fostering corridor interaction and accessibility) is supported by the pattern of trips in the corridor; the average non-work trip length for person trips to and from the Corridor (within ¼ mile of the corridor) is 6.2 miles. If only trips within the corridor are considered, the average trip length is about ½ mile. Thus, many of these very short auto-based trips are good candidates for walk and transit modes. Substituting walking- and transit-based trips for auto-based trips would yield a travel cost savings for residents who take these trips. Collectively, the travel time savings would improve the livability of the Columbia Pike Corridor. The market's response to the associated improvement in quality of life translates into economic development along the corridor.

Development Impacts

The economic development impacts from the improved mobility are anticipated to include:

- Property premiums for properties immediately adjacent to the alignment
- Opportunity for an increase in the pace of corridor revitalization
- Opportunity for new development investment to the counties

Estimates of each type of impact are provided in Table ES-1.

Property Premiums. Based on the literature review and information provided by the developer community, the market is anticipated to capitalize the improved accessibility and connectivity in the property values of the parcels adjacent to the alignment. Based on the collective guidance from the literature and developers, the study applies a 4 percent premium, recognizing that this premium is in the low part of the projected range. This assumption is consistent with that applied in the AA/EA document. The upside risk of this assumption is that if the 4 percent assumption is wrong, it is likely to underestimate the potential outcome—that properties in the corridor appreciate to a greater degree. Accordingly, an upper bound of 10 percent is also estimated—slightly lower than findings from the literature but consistent with developers with local first-hand knowledge of the corridor. Moreover, the analysis concentrates on those properties that are directly adjacent to the corridor as this is where the impact is most likely to occur and would be most pronounced. Property impacts in adjacent parcels are estimated, albeit at more modest percentages given the increased distance from the investment as an additional

means to provide an upper bound on the size of the potential impact. Much of the literature finds that the property premium effect is experienced up to a quarter mile from the streetcar's actual route.

Applying the 4 percent premium to just those parcels directly adjacent to the proposed streetcar alignment yields a minimum $126.2 million increase in value, which translates into an additional $1.2 million in property tax revenue annually at 2011 rates. The 30-year gain in tax revenue from this 4 percent premium is $36.5 million in 2011 dollars. The equivalent values at 10 percent are $315.6 million increase in value, which translates into an additional $3.0 million in property tax revenue annually, yielding roughly $91.2 million in property tax revenue over the 30-year horizon. This is summarized in Table ES-1, below, which also provides the discounted values of the tax revenue stream at 3 percent and 7 percent. Discounting restates a stream of revenues as a net present value, recognizing the opportunity cost of having to collect the revenues gradually over a long period of time.

Acceleration in the Pace of Development. While there was general consensus among survey respondents and the developers who attended the workshop that the pace of development would quicken, the potential gains are small—offering a few years of additional tax revenues at most. Nearly all respondents agreed the number of years of acceleration would be more than one year but less than five, simply because of the lead time needed to start construction. Given the uncertainty concerning the degree of acceleration, several scenarios are estimated here; one where projected development that is directly attributable to the streetcar occurs 2 years faster than without the streetcar and one where projected development occurs 3.5 years faster. One additional scenario was evaluated—that is that the introduction of the streetcar accelerates ALL new development in the corridor (not just new development attributable to the streetcar) by 2.0 years and 3.5 years. The results of each of these acceleration scenarios (net of the baseline revenues collected) are reported in Table ES-1 in base year 2011 values, as well as discounted at 3 and 7 percent.

New Development in the Counties. Recognizing that many factors come into play in the development decision, and that the percentage of net new development cannot be estimated with precision, a 10 percent increase in development intensity is applied as the share that is net new to the corridor and counties. Applying the 10 percent increase in development intensity to projected corridor development yields an additional $1,005.9 million in building stock over what is projected to take place in the corridor over time, translating into an additional $156.2 million in property tax revenue collections over a 30 year period at 2011 rates.

Additional Tax Revenues. Beyond the direct property tax revenues associated with new development, the additional commercial activity associated with the acceleration of building activity and the additional development in the corridor would generate additional tax steams in the form of retail sales, business and professional licenses, and other associated business taxes. The additional revenues associated with these other taxes represent revenues of about $82.8 million (2011) across a variety of tax types.

Table ES-1: Summary of Projected Property Impacts

Line	Type of Impact	Millions $2011	Discounted @3	Discounted @7
Property Premium				
1	Value Created by Property Appreciation @4% (properties directly adjacent to the alignment)	126.2		
2	Value Created by Property Appreciation @10% (directly adjacent to the alignment)	315.6		
3	Tax Revenue Generated @4% (total 30 yrs)	36.5	20.6	10.8
4	Tax Revenue Generated @10% (total 30 yrs)	91.2	51.4	26.9
10% Net New Development Over and Above Projected Baseline Growth				
5	Value of New Building Stock Added to the Corridor	1005.9		
6	Tax Revenue Generated by the New Stock Added to the Corridor (total 30 yrs)	156.2	90.3	47.9
Value of Accelerating Development in the Corridor (net over baseline)				
7	Tax Revenue Generated by Accelerating Projected Development Attributable to the Streetcar by 2 Years (total 30 yrs)	16.1	9.8	5.5
8	Tax Revenue Generated by Accelerating Projected Development Attributable to the Streetcar by 3.5 Years (total 30 yrs)	20.2	12.3	6.9
9	Tax Revenue Generated by Accelerating ALL Projected Development in the Corridor by 2 Years (total 30 yrs)	161.2	98.2	54.9
10	Tax Revenue Generated by Accelerating ALL Projected Development in the Corridor by 3.5 Years (total 30 yrs)	201.6	122.7	68.7

Line	Type of Impact	Millions $2011	Discounted @3	Discounted @7
Business and Other Non-Property Taxes Associated with Expansion of Business Activity in the Corridor				
11	Associated with the Value Created by Property Appreciation @4% (total 30 yrs)	0.0	0.0	0.0
12	Associated with the Value Created by Property Appreciation @10% (total 30 yrs)	0.0	0.0	0.0
13	Associated with New Building Stock Added to the Corridor (10% above projected growth) (total 30 yrs)	82.8	47.9	25.4
Total Increase in Value of Corridor Building Stock				
14	Value of Property Appreciation (@4%) plus Value of New Building Stock Added to the Corridor (1+5)	1132.1		
15	Value of Property Appreciation (@10%) plus Value of New Building Stock Added to the Corridor (2+5)	1321.5		
Total Increase in Tax Revenues (Property and Associated Non-Property Taxes)				
16	Tax Revenue Associated with Property Premium (4%), New Stock Added to Corridor, Non-property Tax Revenues, and Acceration of Projected Development Attributable to Streetcar by 2 Years (3+6+7+13)	291.6	168.5	89.6
17	Tax Revenue Associated with Property Premium (4%), New Stock Added to Corridor, Non-property Tax Revenues and Acceleration of Projected Development Attributable to Streetcar by 3.5 Years (3+6+8+13)	295.7	171.0	91.0
18	Tax Revenue Associated with Property Premium (10%), New Stock Added to Corridor, Non-property Tax Revenues and Acceleration of All Projected Development in Corridor by 2 Years (4+6+9+13)	491.5	287.7	155.2
19	Tax Revenue Associated with Property Premium (10%), New Stock Added to Corridor, Non-property Tax Revenues and Acceleration of All Projected Development in Corridor by 3.5 Years (4+6+10+13)	531.8	312.3	168.9

Notes: Line 3: Extending the radius beyond the adjacent parcels to those located within ¼ mile adds another $34.6 million in tax revenues over the 30-year analysis period. The estimate assumes that the premium impact diminishes with distance and applies just half or a 2% gain to the properties beyond those directly adjacent.

Line 4: Extending the radius beyond the adjacent parcels to those located within ¼ mile adds another $86.5 million in tax revenues over the 30-year analysis period. The estimate assumes that the premium impact diminishes with distance and applies just half or a 5% gain to the properties beyond those directly adjacent.

1.3 Public Benefits and Risks

Throughout the study, two themes repeatedly arose: the ability to develop at greater density than permitted by Arlington's FBC, and concerns regarding affordable housing. Although raised independently, the two can be connected.

Density and Existing Zoning. Participants in the developer workshop voiced repeated concern that Arlington County's existing FBC would not provide sufficient density for them to build to a scale that would capture the full potential of the corridor. The developers recognized that the FBC permits greater density than under traditional zoning, but they still felt that the code is a constraint. The allowable density in the corridor was a greater concern than affordable housing requirements. The requirement for additional density was not uniform along the corridor but was focused on particular opportunity sites. The impetus for greater density was driven by both market potential but also commercial feasibility given affordable housing requirements, parking, building costs, and other costs of development. One of the points of greatest consensus in the developer workshop was the recommendation that Arlington County consider updating the FBC. Fairfax County does not face the same constraints.

Affordable Housing. The second concern regarding streetcar implementation was the potential loss of affordable housing. Arlington County's *Columbia Pike Neighborhoods Area Plan* found that the corridor is already losing its stock of affordable housing, as there is the potential for the projected increase in property values associated with the streetcar investment to add pressure to rents (even as it supports owners). The potential is greatest in Arlington where rents in the corridor increased 59 percent even without streetcar implementation while the average annual wage earned in the metropolitan labor market increased just 45 percent between 2000 and 2010. Pressures on housing affordability are less pronounced in Fairfax County. The affordable housing issue is more complicated, however, than a simple property appreciation issue. On the one hand, streetcar investment will

likely increase property values and pressures on affordability. On the other, providing high quality multi-modal transit with its easy access to jobs and services in a corridor with a large stock of affordable units such as Columbia Pike corridor represents best planning practices for coordinating land use and transportation, a foundation for a successful, sustainable community. Living in a walkable neighborhood with a good mix of uses and good access to public transportation can provide a 16 percent travel savings over living in an auto-oriented environment, according to a report by the Center for Transit-Oriented Development entitled "Realizing the Potential: Expanding Housing Opportunities Near Transit. " The AA/EA prepared for this project concluded that streetcar travelers who diverted from cars would save $25.0 million over the 30-year analysis horizon.

Developing policies that balance the recapitalization of the corridor and attendant price pressures with the desire and need to preserve affordability represents one of the central challenges of realizing residents' vision for the Columbia Pike community. As noted above, there are threshold effects in developing and preserving affordable housing. Arlington County's *Columbia Pike Neighborhoods Area Plan* concludes that high-rise and mid-rise residential developments (greater than 6 stories) are not feasible under current and generally anticipated market conditions but that this could change in the future as rents increase. The study also finds that redevelopment under current conditions was only possible when the new construction replaced the existing units by three to one for low-rise developments (less than 6 stories) – assuming below ground parking is not required. In short, the ability to preserve affordable housing is directly related to rents and permissible density. As noted in the *Neighborhoods Area Plan*, Arlington County's stock of affordable housing is eroding now even without the streetcar. Thus, some type of intervention is required if the county is to retain its affordable housing stock. If the streetcar sufficiently raises rents to permit construction at a mid-rise scale, then this creates greater opportunity for designating a portion of the stock to be maintained at an affordable rate. Depending on the magnitude of the rent increase, subsidy may not be required. Second, the increase in value offers an asset that the counties can leverage to support the affordable housing policy goal. Known as value capture, such an approach recognizes that nearby property owners will benefit from the construction of a new transit system through increased rents, sales, and land values. Some portion of these benefits is utilized to pay for the cost of the improvement or for other designated uses such as community services and affordable housing. Value capture mechanisms are varied and can be tailored to local circumstances.

Additional Public Benefits In addition to the property-related impacts, the streetcar's implementation would generate a variety of public impacts including the value of travel time savings, avoided injuries by transferring travelers to a safer mode from auto travel, a cleaner environment through reduced emissions and travel cost savings (net of transit fares) that make the cost of living in the corridor more affordable. All combined, these benefits total $252.9 million ($ 2011) and are summarized in Table ES-2[1].

The combined total of economic development (property premium) and the value of net new stock is $1,132.1 million assuming a 4 percent premium applied to parcels that are directly adjacent to the corridor. This value rises to $1,321.5 million if a 10 percent premium is applied to adjacent properties[2]. Combined, the two estimates provide a high and low estimate of the likely economic development response in the corridor. In addition, the project yields multiple mobility and public benefits. As noted above, these total $252.9 million ($2011)[3].

[1] The public benefit analysis uses data from the AA/EA on VMT and travel minutes avoided to estimate the value of the public benefits. These are monetized according to guidance from the US Department of Transportation. In addition, an estimate of the system's residual value is developed using FTA's guidance on the typical useful life of assets. The residual value is provided as some of the components of the streetcar investment have a useful life beyond the 30-year time horizon used in this analysis. The residual analysis estimates the value of the unused portion of the asset.

[2] The increase in the value of existing stock combined with the addition of new stock yields greater tax revenues to the counties that would be received in the absence of the streetcar's implementation. As the tax revenues are generated by the property values, they are reported here but not summed with the property premium and construction values to avoid double counting.

[3] Because of the interaction between mobility benefits and property values—economic development occurs in response to the mobility and public benefits and thus "capitalizes" these benefits—the public benefits are not summed directly with the projected economic development estimates.

Table ES-2: Summary of Projected Mobility and Public Benefits

		Millions $2011	Discounted @3	Discounted @7
Mobility and Public Benefits				
20	Value of Travel Cost Avoided by Diverting Auto Travelers to Transit (net of transit fare)	25.2	13.8	7.0
21	Value of Travel Time Saved	141.3	77.4	38.9
22	Value of Fatalities/Injuries Avoided	38.4	21.7	11.3
23	Value of Emissions Avoided (includes CO2)	15.1	8.9	6.5
24	Residual Value of System Investments Beyond the 30-year Horizon	32.8	13.3	9.5
25	Total Mobility and Other Non-Property Benefits (20 through 24)	252.9	135.0	73.3

1. Purpose of Return on Investment Study

The question of how land values and uses would change with implementation of the Streetcar Build Alternative compared to the other alternatives is considered in the Alternatives Analysis/Environmental Assessment (AA/EA) and is anticipated to arise as part of the New Starts/Small Starts grant application. Understanding this effect is helpful in evaluating whether to make the investment, as well as articulating the potential benefits to federal, state and local stakeholders, and the general public. In addition, understanding what policies and regulatory changes should be made in concert with the physical infrastructure investment is important for ensuring that Arlington County and Fairfax County receive the maximum economic development return on their streetcar investment.

1.1 Approach

The ROI Study gathered information through a variety of means. These included review and analysis of the literature describing how transit investment affects economies, direct analysis of the corridor through analysis of data and planning documents, and through interviews and a workshop with developers and key stakeholders. Thus, the approach builds on past work, and combines data analysis with hands-on experience of "what works" in fostering economic development in order to offer a comprehensive assessment of the counties' return on their proposed streetcar investment.

1.2 Data

Data regarding the current and forecasted population, employment, and household growth were obtained from the Metropolitan Washington Council of Governments (MWCOG) Rounds 8.0 (current) and 8.1 (proposed for adoption) forecasts. Parcel and property data from the counties' real estate assessments were also used to identify property values and the tax base for properties adjacent to the project corridor. The counties provided square footage and unit estimates for current and planned retail, commercial, residential, office, and hotel uses and for remaining development capacity. Projections of residential unit growth from Arlington County's *Neighborhoods Area Plan* were used to supplement the MWCOG projections[4]. Travel demand forecasts from the AA/EA document were used to understand how transit ridership could be affected by the new streetcar mode.

1.3 Literature Review

The literature describing property market outcomes in other locations was reviewed. Nearly all of the studies reported that streetcar projects in their city had a positive effect on the city's built environment. However, the significance of the effect varied greatly by city, property type, and study area limits (such as adjacent, ¼ mile, etc.). Studies that considered the impact of new streetcar service identified property value impacts ranging from a gain of 4 percent to 12 percent. Areas that were more focused on residential development were in the lower part of that range; areas more concentrated in office development tended to be in the higher part of the 4 to 12 percent range.

1.4 Online Survey

An online survey was conducted to determine development activity with and without a transit improvement along the corridor. The survey was designed to understand the developers' assessment of the corridor's market potential. The survey was distributed to 53 developers in the region who have either previously built along the corridor or could in the future, depending upon the transit improvements. The survey had a response rate of 41percent; 22 of the 53 surveys were completed. Respondents represented a variety of property types and scales, providing broad coverage of the development community. The online survey, which was comprised of 69 questions, was distributed by sending the link and a cover note by email on behalf of the counties. Because of the built-in logic, which depended on previous answers to direct the respondent to subsequent questions, no respondent had to answer all the questions. The response rate was sufficient to offer a representative sample of the developer community. The survey responses, particularly those in the comments section, offer valuable insight into the corridor market trends not available through data analysis alone. Copies of the survey and responses are provided as Appendices to this report.

[4] The *Neighborhoods Area Plan* is a separate planning effort that is coming to a conclusion as this ROI study is being completed. The consultant team coordinated with the *Neighborhoods Area Plan* team to obtain the most up-to-date projections on residential growth in the corridor. These projections were incorporated into the analysis in two ways: 1) the amount of new units expected and 2) the pace of build-out. In particular, the analysis assumes that 3/5 of the new units projected by the *Neighborhoods Area Plan* are constructed during the analysis period for the ROI study. This assumption was developed in consultation with *Neighborhoods Area Plan* and Arlington Economic Development staff.

1.5 Interviews

Four interviews were conducted; two with developers, an affordable housing representative, and a form based code (FBC) expert from Arlington County. The interviewees were selected to ensure that the study considered the perspective of developers that anchor each end of the corridor, as well as the issues that were determined to be important to the study area. The two developers that were interviewed included Simon Properties, owners of Pentagon City Mall at the eastern terminus of the corridor, and Vornado/Charles E. Smith, owners of both the Skyline development at the corridor's western terminus, as well as the property of the proposed Operations & Maintenance facility in Pentagon City at the eastern terminus. As Columbia Pike has traditionally been an affordable area for residents, Arlington County has set ambitious goals for retaining the affordable housing stock despite the new market-rate developments that are anticipated. Understanding how the affordable housing goals will affect development patterns and developer incentives provided by the counties is an important consideration for the study. A similarly important aspect of the corridor's future development outcomes is Arlington County's FBC. New developments within the nodes of Columbia Pike are encouraged to develop under the FBC, which aims to control the look and size of development, not function. Developers are guaranteed a faster approvals process for following the FBC's guidelines in exchange for a cohesive look and, in select cases, affordable housing or historical property concessions. Interviewing a county expert provided insight to how the FBC guidelines may affect developments along the corridor with or without a transit investment.

1.6 Developer Workshop

A developer workshop was held on the morning of April 18, 2012. The purpose of the workshop was to review survey results and to solicit feedback, clarify results, and validate the key findings for outcomes that can be expected with and without transit investments in the corridor. Nine developers (representing a mix of commercial and affordable housing property types) attended the two hour workshop, as well as staff from both counties and the Executive Director of the Columbia Pike Revitalization Organization (CPRO). During the workshop, the developers were asked to provide their opinions on the property premiums; type, quality, timing, and locations of developments; and any county policies or issues that affect how or when development might take place along Columbia Pike and Baileys Crossroads. The guidance provided by the developers at the workshop helped finalize key assumptions applied in the empirical analysis.

2. Project Need and Existing Conditions

The local jurisdictions of Arlington County and Fairfax County, Virginia, in cooperation with the FTA, are proposing to implement high-quality, high-capacity transit service along a 5-mile corridor, running mainly along Columbia Pike, between the Pentagon/Pentagon City area in Arlington County and the Skyline area located in the Baileys Crossroads Community Business Center (CBC) in Fairfax County. The proposed project, known as the Columbia Pike Transit Initiative, supports the transportation goals of the counties and fosters their vision for a multimodal corridor, linking its walkable, mixed-use, mixed-income neighborhoods and connecting these to the Washington, DC area transit network, and thus, the region's major activity centers. Figure 2-1 shows the location of the project corridor.

2.1 Project Need and History

The project corridor ("corridor") includes the Baileys Crossroads/Skyline area of Fairfax County, a portion of Columbia Pike from Jefferson Street to Joyce Street, Pentagon City, and the northernmost portion of Crystal City in Arlington County. Columbia Pike is a major east-west roadway in Northern Virginia, providing access to the District of Columbia via Washington Boulevard and I-395. The area is experiencing rapid growth as a mixed-use employment, commercial, and residential corridor. The Skyline and Pentagon City areas, anchoring the western and eastern ends of the corridor, are high-density regional activity and employment centers.

For more than a decade, Arlington County and Fairfax County have been preparing to accommodate anticipated economic growth in the corridor. As a result, both counties have successfully engaged in transportation and land use planning initiatives that ensure redevelopment and infrastructure improvements are consistent with community goals. Both counties have also engaged in transportation improvement studies and successfully implemented bus service improvements. In addition, the counties have adopted policies, plans, and zoning laws supportive of high-quality, high-capacity transit to promote transit-oriented (as opposed to transit adjacent) development.

Reflecting residents' goals and vision for their community as articulated in public meetings and the numerous planning initiatives over the past 10 years, the definition of economic development success in this corridor differs from that in the Rosslyn-Ballston Corridor. The focus is less on attracting jobs and more on the distribution of economic welfare—preserving and enhancing affordability and quality of life[5]. A predominantly residential corridor, the economic development strategy for Columbia Pike concentrates on investments and policies that preserve and enhance its economic vibrancy—that focus on making it a desirable place to spend time. Such an approach for Columbia Pike complements economic development efforts elsewhere in the counties that are seeking more traditional development objectives such as headquarters relocations or retail centers. Relocating and expanding companies understand the importance of attractive residential options for their employees away from the office. Particularly for those industries that have a large professional share of their labor, being able to demonstrate an attractive quality of life and nearby desirable housing options at an affordable price directly affects their ability to recruit and retain labor.

Transit is not only a vital component of what makes the corridor function, but is also important to the future vision for the corridor. Within a quarter-mile of the corridor, there are transit-dependent populations, clustered around Jefferson Street, in Pentagon City, and southeast of Four Mile Run. Furthermore, the corridor carries the most bus riders of any corridor in Northern Virginia, with average weekday ridership of approximately 16,000 boardings per day (WMATA 2010, Arlington County 2010). The introduction of an enhanced transit service would add capacity, building incrementally on this market.

[5] The preferred economic development voiced by residents and articulated in numerous corridor plans is consistent with the economic development literature that considers outcomes beyond the traditional jobs/earnings metrics. An example is Paul Courant's 1994 article "How would you know a good economic development policy if you tripped over one? Hint: don't just count jobs," National Tax Journal, vol. 47 (December), pp. 863–81. Courant writes that "with a few notable exceptions, the existing literature [assessing the effectiveness of economic development initiatives in terms of jobs] reflects a great deal of effort that could have been better spent asking different questions. What we should seek to measure in our assessments of local economic development policies is changes in the level and distribution of economic welfare."

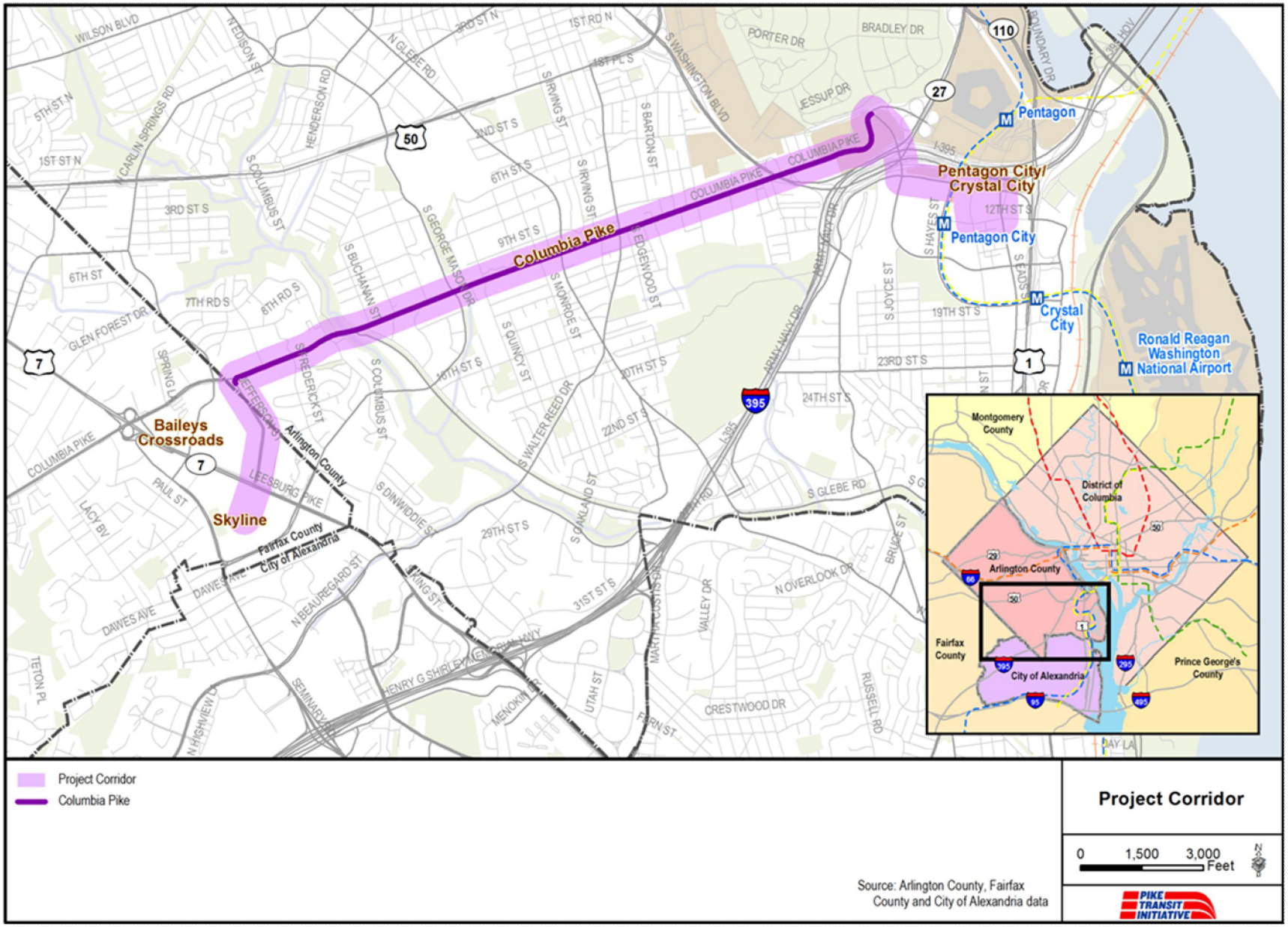


Figure 2-1. Project Corridor

The need for the Columbia Pike Transit Initiative stems from existing and expected transportation problems along the corridor related to limited roadway and transit capacity to accommodate increasing travel demand as the population grows and development increases. Additionally, the Skyline area of the corridor is underserved by transit, limiting the employment center's regional connectivity. At Skyline it starts with the tenant perspective: for example, the General Services Administration (GSA), the leasing agent for the federal government, is a large tenant and looks at the two modes differently. In making its site selection evaluations, GSA would like to have 1,500-2,000SF in the area immediately around a transit stop to satisfy one of its qualifying points. If that criterion cannot be met, a location can get ruled out, and that is significant in a region where the federal government is the dominant employer[6]. These problems and needs are summarized in Table 2-1 and described below.

Table 2-1. Problems and Needs

Problem	Need
Limited roadway capacity to handle an increase in automobile trips.	• Improve transit capacity; and • Improve transit mode share.
Existing transit capacity is insufficient to support future growth and development within the corridor.	• Invest in transit service that supports growth and economic development.
Skyline, a regional center of office, commercial and residential activity, is poorly connected to the regional transit network.	• Improve transit access and regional connectivity to and from Skyline.

Continued population and employment growth will increase transportation demand along the corridor. According to the MWCOG forecasts, population within a quarter-mile of the corridor is projected to increase by 21 percent from 2010 to 2030, while employment is projected to increase by 23 percent. The population and employment growth (spurred by redevelopment) and operational improvements to existing transit service have generated a 45 percent increase in corridor weekday transit ridership since 2004. As land along the corridor continues to be redeveloped with medium- to large-scale mixed-use projects, and population and employment increases and development intensifies, the demand for transit will also increase. Anticipated baseline growth of 16 percent will add another 80,000 daily trips to the corridor by 2030, assuming relatively minimal change to the distribution of trips between commute and non-commute. However, the counties have an explicit policy against adding additional automobile through-capacity to the Columbia Pike corridor.

The counties initially addressed this emerging problem with implementation of the PikeRide program. The PikeRide program has been successful by improving bus stop locations and providing convenient and reliable transit service along the corridor. Currently, the Metrobus and ART bus routes on Columbia Pike operate at combined 2- to 3-minute headways during peak-hours. However, this high transit frequency limits the ability to improve service quality and reliability by simply adding more buses to the schedule, leading to bus bunching and decreased service reliability. Both Arlington County and Fairfax County need to identify potential transit investments that will:

- Provide higher-capacity transit service to cope with underlying growth; and
- Increase transit mode share while decreasing single-occupancy vehicle use along the corridor.

The Baileys Crossroads Revitalization Commercial District in Fairfax County and Arlington County's Columbia Pike Initiative have provided the necessary land use plans and zoning codes to encourage higher density redevelopment along Columbia Pike. These efforts have resulted in two major redevelopment projects in the Baileys Crossroads area of Fairfax County and six major residential redevelopment projects completed in the Arlington County portion of the corridor since 2002. Additionally, ten projects, mostly mixed-use developments, are either under construction or approved along the overall corridor.

The continued success of redevelopment efforts is dependent upon a robust transportation system to connect the new developments with existing population and employment centers. Most critically, improved transit service will demonstrate a permanent and on-going commitment to transportation by the public sector. Sustaining and improving the level of transit service investment will reassure those who would invest or reinvest in the corridor that higher-density, transit-oriented, and mixed-use projects are worth the risk in the real estate market, and

[6] Described in the developer workshop.

given this reassurance, jobs, housing, and services will continue to flow into the corridor. As a result, both Arlington County and Fairfax County need to identify potential transit investments that will:

- Improve mobility and accessibility of the corridor in a way that supports growth and economic development.

Furthermore, at the western end of the corridor, the existing transit network provides relatively limited service to the Skyline area in Fairfax County, an area of high-density office, residential, and retail. Only one Metrobus line provides a direct connection from Skyline to the Pentagon Metrorail station and there is no direct connection to Pentagon City. Both Arlington County and Fairfax County need to identify potential transit investments that will:

- Improve transit access; and
- Improve regional connectivity to and from Skyline.

2.1.1 Project History

After recognizing the increased demand of the emerging transit market, Arlington County and Fairfax County initiated a local Columbia Pike Alternatives Analysis in 2004 (local AA) to consider the development of an advanced transit system connecting the Pentagon/Pentagon City area to Skyline. At the time, the counties were not seeking federal funding and a federally approved AA was not required; therefore, the local AA was not submitted for approval by FTA. The goal of this local AA was to examine a wide range of possible transit solutions and identify the solution that best served the needs of the corridor. The selected transit system and mode would increase transit capacity, improve mobility, and spur economic development along the corridor. The local AA included agency, stakeholder, and citizen input throughout the process.

The local AA process yielded a "Modified Streetcar Alternative," which included a combination of streetcar and bus service as the preferred transportation solution that best served the needs of the corridor. Subsequently, the Arlington County Board and Fairfax County Board of Supervisors endorsed the "Modified Streetcar Alternative" in 2006. In 2008, the two counties decided to seek federal funding, thereby requiring a federally approved AA. In 2010, the two counties submitted a Project Initiation package to FTA to officially state their interest in pursuing federal funding from FTA. The "Modified Streetcar Alternative," which was selected as the preferred alternative in the local AA process, is the basis of the "Streetcar Build Alternative" presented and evaluated as part of this study.

Currently, Arlington and Fairfax Counties, in coordination with FTA, have prepared and presented an AA/EA that evaluates alternatives and identifies the environmental impacts of the proposed solution in compliance with FTA New Starts/Small Starts requirements. This document was also prepared to aid local decision-makers in selecting a locally preferred alternative (LPA) that best serves the current and expected transportation needs of the corridor and supports the project goals and objectives.

2.2 Existing Conditions

This section summarizes some of the key demographic and socioeconomic characteristics of the corridor that underpin its development potential.

2.2.1 Population and Demographics

The neighborhood commercial and multi-family residential development along the corridor has helped create a socially and economically diverse area that is embraced by its residents. The Columbia Pike corridor in Arlington County and Baileys Crossroads in Fairfax County has concentrations of elderly and immigrant populations who are frequently dependent on high-quality transit. Based on 2000 Census figures reported in the revitalization plan for the corridor, over 128 countries of national origin[7] are represented among the Columbia Pike corridor's residents; and, nearly 37 percent of Arlington County's total Hispanic population lives in the corridor, as reported in Arlington County's 2010 Census summary for Columbia Pike.

In addition, the corridor is home to several concentrations of transit-dependent populations, clustered around Jefferson Street, Pentagon City, southeast of Four Mile Run, and Baileys Crossroads. These populations show a high propensity to take transit due to zero-car households, age (under age 17 or over age 65), or income level (below the federally designated poverty line).

2.2.1.1 Arlington County

Arlington County contains the longest segment of the corridor, and the 19 Census tracts located within ¼ mile of the Pike are home to approximately 19 percent of the county's total population, based on 2010 Census figures. The estimated population of the corridor is 39,450 residents. Two thirds of the corridor's population is non-white,

[7] This number has not yet been updated for the 2010 US Census.

making it easily the most diverse corridor in the county. As a comparison, the Jefferson-Davis Corridor is the next most-diverse, with 31 percent of the population being non-white. Hispanic or Latino races make up 32 percent of Columbia Pike's population. Columbia Pike has a density of 21 persons per acre, higher than the county's average of 12 persons per acre, but comparatively much lower than either the Jefferson-Davis corridor (23 persons per acre) or Rosslyn-Ballston corridor (33 persons per acre).

The majority of homes along Columbia Pike are rental properties. According to the *Columbia Pike Neighborhoods Area Plan*, there are over 9,000 rental apartments and 3,200 condominiums in the corridor. With the proposed growth from redevelopment another 9,600 units are anticipated, resulting in over 21,000 units by 2040.

Currently, Columbia Pike has 11,300 jobs, and an additional 18,300 are expected by 2040, growing by 62 percent. The median household income in Arlington County is over $95,000 per year. The Rosslyn-Ballston and Jefferson Davis corridors have similar values, but the Columbia Pike corridor has a median household income range between $61,000 and $64,000, which is considerably lower than the remainder of the county. Arlington County as a whole boasts one of the highest average levels of education in the country, with 70 percent of the population having a bachelor's degree or higher. The average along Columbia Pike, however, is much lower at 49 percent.

2.2.1.2 Fairfax County

The population of Baileys Crossroads was estimated at 10,884 in 2009 and is projected to increase by 4.87 percent from 2009-2014 to 11,414. Baileys Crossroads household developments are primarily townhouses and multifamily apartment buildings. In 2010, the planning district included 4,741 households, and by 2040 it is expected to grow to 5,772 households, or by over 21 percent.

Nearly 19,000 jobs are in the planning district. The Round 8.0 Forecasts predict adding 2,362 jobs by 2040. In Fairfax County, the median household income from 2006-2010 was $105,416, which is one of the highest in the state of Virginia. The median income in the Baileys Crossroads CDP, however, was much lower than the county average, at $71,118, while Baileys Crossroads Planning District was estimated to have a median household income of $65,588 in 2009. According to the American Community Survey (ACS) in 2008, 45.4 percent of the Baileys Crossroads CDP population had obtained a bachelor's degree or higher. This is compared to the Fairfax County overall percentage of 58.1 percent that obtained a bachelor's degree or higher and 91.8 percent at least graduated from high school. Together, the Columbia Pike corridor is home to rapidly growing, lower-than-average-income, ethnically diverse, often transit-dependent populations.

2.2.2 Land Use and Economic Development

Figure 2-2. Typical Streetscape on Columbia Pike

The residential and commercial building stock along Columbia Pike was primarily built between 1961 and 1972 along the Arlington County segment of Columbia Pike; new commercial construction in the 1970s and 1980s consisted primarily of free-standing drive-through banking facilities, fast food restaurants, and convenience stores. Collectively, these building patterns have yielded older, auto-oriented suburban commercial strip developments (Arlington County, Columbia Pike Initiative, 2005). The typical streetscape can be seen in Figure 2-2.

Similarly, Baileys Crossroads in Fairfax County has developed primarily as commercial strip and shopping centers such as the Skyline Complex, a portion of which can be seen in Figure 2-3.

Figure 2-3. Skyline Complex in Baileys Crossroads, Fairfax County

Arlington County and Fairfax County have each introduced comparable strategies to help foster the revitalization of the Columbia Pike corridor. As articulated in the *Columbia Pike Initiative: A Revitalization Plan—Update 2005*, the goal for Arlington and the partner jurisdictions is the transformation of the corridor from an "aging auto-oriented, suburban, commercial strip" back into the more vibrant, pedestrian-friendly, "Main Street" destination that it once was. Similarly, the *Fairfax County Comprehensive Plan for the Baileys Planning District—2011 Edition* includes a vision of a "pedestrian-oriented, mixed-use development with a pedestrian scale and urban character that will complement the adjacent residential areas and promote transit usage." Given the already high transit usage and the density in the corridor, the Columbia Pike Transit Initiative is intended to help foster this recapitalization of the aging corridor. Redevelopment is already underway along the corridor, with new residential, commercial, and retail centers being constructed. Two new developments, the 55 Hundred and Halstead, can be seen in Figures 2-4 and 2-5.

Figure 2-4. The 55 Hundred Complex on Columbia Pike

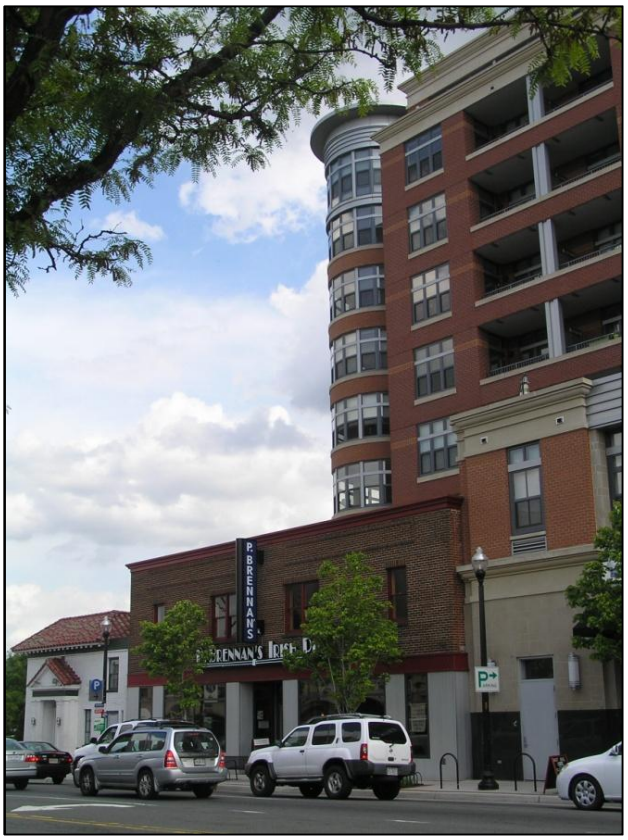


Figure 2-5. The Halstead Complex on Columbia Pike

2.2.3 Un-built Development Capacity

The corridor is a prime location for accommodating future development growth in Arlington County and Fairfax County due to its existing high transit usage, opportunities for redevelopment, and the counties' existing transit-supportive plans and policies. The Columbia Pike corridor and Baileys Crossroads offer significant opportunities for office, retail, residential, and hotel expansion; however, given the demand in the Washington, D.C. metropolitan area for transit accessible housing and commercial development, it will be difficult to reach the full development potential without additional investment in capacity-expanding projects, particularly transit and additional bicycle/pedestrian enhancements.

2.2.3.1 Arlington County

Given its location, transportation access, and community focus, Arlington County has experienced significant commercial and residential development and redevelopment over the last several decades. This development has been focused largely along WMATA's Metrorail Corridors in the county: Rosslyn-Ballston (Orange Line) and Jefferson Davis (Yellow and Blue Lines). As of 2007, almost 80 percent of the office space and 90 percent of hotel rooms in Arlington County were located along these Metrorail corridors. Table 2-2 summarizes the 2007 development and development capacity remaining in Arlington County and the Metrorail Corridors.

Table 2-2. Remaining Development Potential in Arlington County (2007)

	Existing or Under Construction	Build Out	Development Remaining	% Build Out
Arlington County				
Office (sf)	44,015,012	55,455,100	11,440,088	79%
Retail (sf)	9,580,603	11,467,600	1,886,997	84%
Residential Units	99,701	124,200	24,499	80%
Hotel Rooms	9,984	11,100	1,116	90%
Rosslyn-Ballston Metrorail Corridor				
Office (sf)	22,632,402	30,052,000	7,419,598	75%
Retail (sf)	2,995,529	3,495,900	500,371	86%
Residential Units	27,756	37,100	9,344	75%
Hotel Rooms	3,741	3,934	193	95%
Jefferson Davis Metrorail Corridor				
Office (sf)	12,631,955	13,923,500	1,291,545	91%
Retail (sf)	2,740,565	2,799,200	58,635	98%
Residential Units	10,434	17,265	6,831	60%
Hotel Rooms	5,298	5,944	646	89%

Source: Planning Research and Analysis Team (PRAT) of the Arlington County Planning Division, Development Capacity in Arlington's Metro Corridors, December 2007

Because Arlington County does not have many large undeveloped Greenfield sites, additional new development would have to take advantage of parcels that could be redeveloped to a higher valued use. As a result, Arlington County has planned for 'second generation' redevelopment in downtown corridors such as Crystal City, Rosslyn, and Clarendon. In addition, mixed use development projects are being established for Pentagon City, Potomac Yard, Court House, and Ballston. The Columbia Pike corridor and Baileys Crossroads areas are also in position to accommodate some of this growth due to their location, planned transportation improvements, and community character.

In September 2010, an analysis of the development capacity for the Columbia Pike area was developed by the Planning Research and Analysis Team (PRAT) of the Arlington County Planning Division. This is the data that were applied in the EA/AA. As a result, a direct comparison with Columbia Pike's development square footage remaining is not possible due to potential changes in the build out square footage; however, the percentage build out numbers provide an appropriate context for the potential of the corridor to accommodate additional development.

Since that time, Arlington County has undertaken its Neighborhood Areas Plan and updated the estimates of existing development and potential development. In order to make use of the most recent information available, this study updates the development potential reported in the EA/AA (the best available information at the time that analysis was conducted)8. Of particular note, the analysis for this report assumes that new residential stock

[8] Estimates provided by *Neighborhood Areas Plan* staff in coordination with Arlington Economic Development staff.

projected as part of the Neighborhood Areas Plan comes online over a 50-year period rather than the 30-year horizon applied in this analysis. Thus, this study only uses three-fifths of the projected Neighborhood Areas Plan residential stock in developing the estimates reported in this study.

Table 2-3. Development Potential along Columbia Pike (2012)

Development Type	Existing or Under Construction	Build Out	Development Remaining	% Build Out
Office (sf)	571,239	1,117,373	546,134	51%
Retail (sf)	734,696	899,201	164,505	82%
Residential Units (A)(B)	12,841	26,741	13,900	48%
Hotel Rooms (A)	483	776	293	62%

Source: Arlington County Neighborhood Areas Plan and Arlington Economic Development. (A) Conversion from residential units to square footage assumes average of 1,100 sf per unit. Hotel room conversion assumes 600 sf per unit on average. (B) Analysis assumes that only 3/5 of the projected net new construction occurs over the 30-year horizon used in this study.

In addition, the Pentagon City portion of the corridor also has additional development potential. This is summarized in Table 2-4 below.

Table 2-4. Development Potential in Pentagon City Portion of the Corridor (2012)

Development Type	Existing or Under Construction	Build Out	Development Remaining	% Build Out
Office (sf)	1,223,200	3,809,200	2,586,000	32%
Retail (sf)	1,712,400	1,907,800	195,400	90%
Residential Units (A)(B)	5,130	8,590	3,460	60%
Hotel Rooms (A)	690	1240	550	56%

Source: Arlington County PRAT and Arlington Economic Development. (A) Conversion from residential units to square footage assumes average of 1,100 sf per unit. Hotel room conversion assumes 600 sf per unit on average.

2.2.3.2 Fairfax County

The *Fairfax County Comprehensive Plan* analyzes the development capacity for the Baileys Crossroads CBC. A summary of the development capacity for the portion of the Baileys Crossroads CBC located within the corridor study area is summarized in Table 2-5. As shown in the table, Baileys Crossroads has the development capacity available through redevelopment and revitalization to accommodate new office, retail, and residential development attracted to the region. Figure 2-6 illustrates some of the available space in the Skyline Complex.

Table 2-5. Remaining Development Potential in Baileys Crossroads (2011)

Development Type	Existing or Under Construction	Build Out	Development Remaining	% Build Out
Office (sf)	3,484,379	5,108,000	1,623,621	68.2%
Retail (sf)	1,375,473	1,547,000	171,527	88.9%
Institutional (sf)	28,865	102,000	73,135	28.3%
Residential Units	4,569	8,660	4,091	52.8%

Figure 2-6. Available Leasing Space in Skyline

2.2.4 Affordability

Figure 2-7. Greenbrier Apartments on Columbia Pike in Arlington

With housing rents rising in the corridor, the proportion of affordable housing stock has decreased in both Arlington and Fairfax Counties. The Columbia Pike corridor and Baileys Crossroads provide opportunities for affordable housing and transportation for its residents. Figure 2-7 shows Greenbrier Apartments, one of many affordable complexes along Columbia Pike. Table 2-6 summarizes housing and transportation costs for the block groups that are adjacent to the project alternatives. The data are taken from the Center for Neighborhood Technology's (CNT) Housing + Transportation (H+T) Index, a measure of the combined neighborhood housing and transportation costs divided by average neighborhood income as a measure of the cost burden. The values in the table below represent the Regional Moderate Household series, which are used to represent a working family in the selected area. Income is based on 80 percent of the Area Median Income (AMI) where average household size and average working commuters per household remain constant for the regional average. This household type allows the user to view areas that are affordable to the typical working family, who might have a more constrained household budget. CNT has defined an affordable range for H+T as the combined costs consuming no more than 45 percent of income.

Of note, Table 2-6 illustrates that only two Census block groups within the corridor currently exceed the 45 percent affordability threshold—both of which are near Baileys Crossroads. However, while most of the block groups and the Washington, D.C. MSA are currently below the 45 percent threshold, these areas will continue to approach and likely exceed this threshold in the near future as the region continues to grow and congestion levels increase. The *Columbia Pike Neighborhoods Area Plan* notes that rents in the Columbia Pike/Shirlington area have increased by 58 percent between 2000 and 2010 while the AMI only increased by 25 percent. This gap illustrates that residents are paying a higher proportion of their income to housing, indicating a lower affordability than in the past.

2.2.4.1 Arlington County

For decades, the neighborhoods along Columbia Pike have been known for their affordability. Arlington County has explicit goals of not only maintaining the existing stock of affordable housing, but also adding to it. Of the 9,077 rental apartments along the corridor, 13 percent are committed affordable units, 32 percent are affordable to households with incomes at 60 percent of the AMI, and 35 percent are affordable at 80 percent of AMI (Arlington County, *Columbia Pike Neighborhoods Area Plan,* 2012).

2.2.4.2 Fairfax County

A report on preserving Market Affordable Units (MARKS) in Northern Virginia described Fairfax County's decreasing stock in affordable rental units: 8,000 units that were affordable to 70 percent of AMI populations were lost between 2002 and 2010[9]. There are several challenges to maintaining their stock of affordable housing. The existing stock is comparatively old as 93 percent of the units are over 40 years old. The majority of affordable units are in lower-density developments, the type of development most likely to be converted to new uses. The transportation system and built environment inhibit easy access to transit for residents (NVAHA, Charting a Way Forward, 2011).

[9] Charting a Way Forward: Preserving Market Rate Affordable Housing in Northern Virginia's Inner Suburbs, Northern Virginia Affordable Housing Alliance, 2011.

Table 2-6. Relative Housing and Transportation Costs

Blockgroups	Housing Cost as Share of Income (%)	Housing + Transp. Cost as Share of Income (%)	Area Housing + Transp. Cost Relative to MSA Average	Transp. Cost as Share of Income (%)	Area Transp. Cost Relative to MSA Average
510131022001	17.1	31.9	0.73	14.8	0.84
510131023002	29.9	44.8	1.03	14.9	0.85
510131023003	23.1	38.4	0.88	15.3	0.87
510131023004	31.2	47.6	1.09	16.4	0.93
510131027001	15.3	29.7	0.68	14.4	0.82
510131028001	19.0	33.6	0.77	14.6	0.83
510131028004	16.6	31.0	0.71	14.4	0.82
510594515004	27.0	43.0	0.99	16.0	0.91
510594528002	23.1	37.8	0.87	14.7	0.84
510594528003	20.6	35.1	0.81	14.5	0.82
515102001011	15.9	32.1	0.74	16.2	0.92
515102001015	29.8	46.4	1.06	16.6	0.94
510594528004	20.3	35.1	0.81	14.8	0.84
510131022002	16.5	30.9	0.71	14.4	0.82
510131025001	22.2	35.7	0.82	13.5	0.77
510131025002	18.3	32.6	0.75	14.3	0.81
510131025003	25.7	41.0	0.94	15.3	0.87
510131026001	20.6	35.4	0.81	14.8	0.84
510131032004	18.5	34.4	0.79	15.9	0.90
510131033001	20.4	35.1	0.81	14.7	0.84
510131034011	13.6	30.8	0.71	17.2	0.98
510131034021	29.9	42.6	0.98	12.7	0.72
510131035002	21.0	34.1	0.78	13.1	0.74
510131034023	27.3	40.6	0.93	13.3	0.76
Washington, DC MSA	26.0	43.6	1.00	17.6	1.00

2.2.5 Historic Properties

2.2.5.1 Arlington County

Arlington County's Historic Resource inventory lists five buildings along the Columbia Pike corridor in the "essential" category. These historic properties still contain some of the most original features of the original structure. The properties include garden-style apartment complexes (Arlington Village, Barcroft Apartments, and Fillmore Gardens), the Arlington Theater, and the Arlington Village Shopping Center. Although infill and redevelopment are possible on certain sites, preservation is the primary objective. The *Columbia Pike Neighborhoods Area Plan* recommends that the County permit taller building heights and/or new developments on these sites to offset their preservation. The Barcroft Apartments can be seen in Figure 2-8.

Figure 2-8. The Barcroft Apartments on Columbia Pike

2.2.5.2 Fairfax County

Fairfax County is home to numerous historical landmarks, including some of the oldest markers in the history of the United States. The county contains some of the Boundary Stones set in place in 1791-1792 to designate a 100 square mile site within which President George Washington would assign the nation's capital. One of the stones, SW6, is in the median along Jefferson Street in Baileys Crossroads. The stones are protected landmarks as part of the National Register of Historic Places and the Virginia Landmarks Register. As of 2011, there are no other historic sites within the Baileys Crossroads area.

2.2.6 Transportation

The corridor is served by WMATA and Arlington Transit (ART) bus lines with connections to the WMATA Metrorail system as well as regional employment and activity centers, including downtown Washington, Pentagon City, the Pentagon, Skyline, and the Rosslyn-Ballston corridor in Arlington. Metrobus services along Columbia Pike consist of the Metrobus 16 Line (comprised of a number of 16 Line routes). Metrobus service is coordinated with ART service (described below) to provide frequent, convenient service along Columbia Pike and adjacent streets. Current bus service on Columbia Pike has a combined peak period service frequency of less than three minutes and an average weekday ridership of approximately 16,000 riders per day. Current transit travel times in the Columbia Pike corridor for each of the Metrobus 16 Line routes are summarized in Table 2-7. The average non-work trip length for person trips to/from the Columbia Pike corridor (within ½ mile of the proposed alignments) is 6.2 miles, and if only trips within the corridor are considered, the average trip length is one mile.

Table 2-7. Current Actual Vehicle Run Times by 16 Line Route

Route	From/To	Trip Time
16A	Annandale to Pentagon	46 minutes
16B	Culmore to Pentagon	31 minutes
16D	Culmore to Pentagon	49 minutes
16F	Culmore to Pentagon - Limited	21 minutes
16G	Columbia Heights West to Pentagon City	17 minutes
16H	Jefferson Street to Pentagon City	27 minutes
16J	Culmore to Pentagon via Jefferson	32 minutes
16L	Annandale to Skyline to Pentagon	33 minutes
16W	Skyline to Pentagon City via George Mason	24 minutes
16Y	Four Mile Run Road to Farragut Square	43 minutes

Source: WMATA automatic passenger count (APC) data (April 2010)

WMATA Metrobus vehicles along Columbia Pike are 40 and 43-foot transit buses that run on compressed natural gas (CNG). The supporting ART bus network consists of 31 and 35-foot low-floor buses, which also run on CNG. Bus stops along Columbia Pike are currently located at most intersections, approximately 1/8-mile apart. Metrobus buses stop at all bus stops, with the exception of Route 16F, which is a limited-stop service. Bus stops are shared with other Metrobus routes running in the corridor as well as the ART services that run along Columbia Pike for short segments. All stops are equipped with standard Metrobus flag identification signs and special PikeRide information cases, which contain route maps and schedule information. Stops served by ART also have ART flag signs. Many stops have shelters with benches and other amenities such as trash receptacles; other stops simply have a flag sign with schedule information.

Fare payment options for riders include cash payment on the bus, flash passes, and the SmarTrip card, which is a reloadable electronic payment card. SmarTrip cards can be reloaded on the bus, at CVS and Giant stores, and at Metrorail stations. All boardings are through the front door where the driver ensures that the proper fare is paid. Only one park-and-ride lot exists in the corridor. This is a small park-and-ride lot owned by Arlington County that is located at Columbia Pike and Four Mile Run Drive adjacent to an existing PikeRide bus stop. The Metrobus 16 Line vehicles are currently stored and maintained at WMATA's Four Mile Run Bus Garage located at South Eads Street and South Glebe Road in southeast Arlington County. ART buses are stored and maintained at the ART House maintenance facility, located at South Eads Street and 32nd Street South, adjacent to the WMATA Four Mile Run facility.

Columbia Pike is a principal arterial that carries an average of 25,000 to 30,000 vehicles daily between the Fairfax County line and Washington Boulevard and an average of 12,000 vehicles daily between Washington Boulevard and the Pentagon access road (VDOT 2009 data). Generally, Columbia Pike is a four-lane divided street with two lanes in each direction. However, roadway widths, lane configurations, and planting strip and sidewalk features vary along the corridor. Depending on the corridor segment, there may be two-way left-turn lanes, narrow striped medians, or no median area. Most of the area intersections currently operate with a Level of Service (LOS) of D or better during the morning and afternoon peak hours. A LOS D indicates a higher volume of traffic than the free-flow state and slightly slower speeds, with the increased likelihood of delays due to incidents. The Glebe Road and Columbia Pike intersection currently operates at LOS E, indicating that it is at capacity in the peak hour.

2.2.6.1 Pedestrian and Bicycle Accommodations

Currently, pedestrian facilities consist primarily of sidewalks and crosswalks, which are generally present throughout the area. The sidewalk widths and separation from vehicular travel way vary throughout the area. No on-street bike lanes exist within the area; however, the Washington & Old Dominion (W&OD) and Four Mile Run shared use trails provide off-street facilities for pedestrians and bicyclists at the western portion of the study area near Four Mile Run stream. The existing pedestrian facilities include sidewalks, pedestrian crossings, and access to adjacent uses. Streets within the study area generally include sidewalks along both sides of the street with only a

few minor exceptions. However, sidewalk width varies greatly; sidewalks are as narrow as three feet and as wide as 15 feet. Pedestrian signals typically have countdown displays and push buttons to cross Columbia Pike and side streets. Crosswalks and curb ramps are typically provided at pedestrian crossings of signalized intersections. Some crosswalks do not have curb ramps, and some curb ramps do not have detectable warning surfaces. Some of the study area streets are very wide and as a result may be challenging to cross. The curb-to-curb street width varies between 40 feet and 84 feet, and most street segments do not have raised medians or other types of mid-crossing pedestrian refuges. Distances between signalized pedestrian crossings vary along the corridor. Most commercial areas are set back from the street with parking areas located between the sidewalk and storefronts. Convenient pedestrian access from side streets to commercial and residential developments is also limited in many areas.

Columbia Pike does not have bike lanes or other on-street bicycle accommodations. The only segment of the proposed on-street transit alignment that has striped dedicated bicycle lanes is South Hayes Street in Pentagon City. Some roadway segments of the proposed transit alignment are designated as on-street bicycle routes but do not have special accommodations for bikes; these include South Joyce Street and Army Navy Drive. The W&OD Trail and Four Mile Run Trail are the only shared-use trails in the study area and provide off-street facilities for pedestrians and bicyclists that parallel the Four Mile Run stream. The availability of bicycle parking varies along the corridor. Some areas of Columbia Pike, Pentagon City and Crystal City have recently installed bicycle racks. Arlington County recently installed 41 new bicycle racks along Columbia Pike between South Oakland Street and South Garfield Street as a part of a current Arlington County streetscape project. Other bicycle racks have been installed in association with recent private development projects such as the Halstead.

2.3 Conclusions

The corridor is a vital transportation route for commuters to and from Washington, D.C. as well as a vibrant neighborhood with diverse populations, incomes, educations, and backgrounds. Providing the region with enhanced transit will allow the corridor to continue to redevelop mixed-use developments that will support residents with local employment, retail, and recreation opportunities. Additionally, connecting these inner-ring suburbs to WMATA's regional Metrorail system will save users time and money. Higher-quality transit in this corridor would present a variety of opportunities for residents, developers, and the counties alike. The risks and benefits of such an investment are important considerations and will be investigated in the following chapters.

3. Planning Initiatives

3.1 Introduction

Arlington County and Fairfax County have each introduced a similar strategy to help foster the revitalization of the Columbia Pike corridor and Baileys Crossroads. As articulated in the *Columbia Pike Initiative: A Revitalization Plan—Update 2005*, the goal for Arlington County and the partner jurisdictions is the transformation of the corridor from an "aging auto-oriented, suburban, commercial strip" into a more vibrant, pedestrian-friendly, "Main Street" destination. Similarly, the Fairfax County Comprehensive Plan for the Baileys Planning District—2011 Edition includes a vision of a "pedestrian-oriented, mixed-use development with a pedestrian scale and urban character that will complement the adjacent residential areas and promote transit usage" (*Fairfax County Comprehensive Plan*, 2011).

Collectively, the zoning, premium transit availability, and the enhanced walkability and accessibility of the corridor would not only accommodate the projected population and employment growth, but could also support the transformation of residents' experience of place in the Columbia Pike corridor and Baileys Crossroads. Real estate studies are finding that more walkable environments are desirable places for development investment (Gary Pivo and Jeffry Fisher, *The Walkability Premium,* 2010). This desirability, in turn, fosters reinvestment and recapitalization of the building stock, helps change the perception of older corridors, and contributes to creating a destination to shop, dine, and enjoy leisure time (as illustrated in Figure 3-1).

Figure 3-1. The Arlington Cinema and Drafthouse, a "Main Street" Inspiration

3.2 County Planning Visions and Plans

Columbia Pike is a vital thoroughfare and serves as a critical gateway between Northern Virginia and the District of Columbia. Over the past decade the formerly low-density, auto-dependent corridor has been transforming steadily. Absent a proactive and coordinated strategy to guide this evolution, the resulting development pattern along Columbia Pike will reflect the assemblage of numerous incremental investments that resembles a newer version of the current corridor as opposed to a more transformative set of investments that more fully captures the potential of this corridor, consistent with the preferences of the resident community.

Accordingly, Arlington and Fairfax Counties have been actively engaged in working with the neighborhoods along the Pike to articulate a long-range vision for how they would like this transformation to unfold, and the policies and investments needed to realize that vision. The Columbia Pike Transit Initiative is thus one outcome of a decade's worth of planning work on the part of community residents and the county planning staffs that serve these communities.

3.2.1 Arlington County

According to Arlington County's Community Planning and Housing Development Department (CPHD), the main purpose of the Columbia Pike Special Revitalization District is to renew the commercial areas to create a "Main Street" district. Currently, the area is auto-centric with a disproportionate number of free-standing drive-through establishments. Figure 3-2 shows the current auto-centric development. The County lists the following elements as likely to be part of the area's remake to a pedestrian friendly one (Arlington County, *The Vision: Arlington's Main Street)*:

- Mixed-use development districts (retail, office, residential, cultural)
- Street frontage at a pedestrian scale with articulated ground-floor retail
- Buildings oriented to Columbia Pike
- Placement of buildings at the back of sidewalks
- Buildings built close together forming a continuous "street wall" characteristic of an urban environment
- Parking located underground or to the rear of buildings
- Appropriate transitions to residential neighborhoods
- Enhanced public and pedestrian transportation
- Enhanced streetscape

Figure 3-2. The Current Auto-centric Development Pattern on Columbia Pike

Many of Arlington County's goals focus on "place making," the conscientious action by developers and County officials to create a multi-purpose area that is pleasant for a multitude of reasons. Arlington County's emphasis on creating a high-quality environment is in concert with the passage of a FBC, which guides architecture, building materials, and urban design along the Columbia Pike corridor (Arlington County, *Columbia Pike Form Based Code*).

Arlington County recognizes the importance of commercial and social activities for Columbia Pike's renewed shopping district by describing it as "a place that is the center of the community's commercial and social life to meet friends, to see a movie or to window shop." To achieve this renewed district, the corridor must be reshaped from auto-centric (as seen in Figure 3-2) to pedestrian focused. Schematics of recently approved plans indicate that businesses and residential apartments will not only be larger in scale and co-located in the same building, but also more upscale.

3.2.1.1 Form Based Code

Revitalization and redevelopment of the corridor has been a goal of Arlington County since the 1980s. Pursuant of this goal, Arlington County developed and adopted a FBC in 2003. The purpose of the FBC was to have a set of regulations that would support the revival of Columbia Pike into the new "Main Street" of South Arlington. The FBC will allow for a variety of sizes and uses of development along Columbia Pike, provided that developers follow certain guidelines pertaining to building heights, setbacks, and public spaces. Developments conforming to the FBC are granted faster site approvals, which saves developers money. The focus of the FBC is primarily on the form of the development, with less emphasis on the use. Developments that do not conform to the FBC are issued a use permit and the resulting approval process is longer than projects adhering to the FBC. The right-of-way would be converted from auto-centric to incorporate a more walkable and transit-accessible community through proposed transportation improvements along the corridor. The county's Super Stops program, comprised of upgrading and consolidating transit stops to include larger shelters and real-time passenger information, is currently underway.

The plans for land uses along Columbia Pike focus on redevelopment in four special revitalization districts: Town Center, Village Center, Neighborhood Center (split by Four Mile Run Drive), and the Western Gateway. These nodes are the locations along Columbia Pike where the densest developments and enhanced bus stop, Super Stops, are planned. Within the boundaries of each node are FBC regulations to describe the building height, ground-level retail space, mezzanine and balcony limits, setbacks, building envelopes, building orientations to the street frontage, façade fenestrations, alley setbacks, civic and pedestrian uses, and parking structure guidelines. These districts would then be linked together along Columbia Pike by residential uses.

Characteristics of the expected developments along Columbia Pike under the FBC include:

- Mixed-uses primarily consisting of retail, office, residential, and cultural uses;
- Building frontages oriented to Columbia Pike with ground-level retail and sidewalks abutting buildings;
- Continuous buildings along the street front to create a more urbanized feel;
- Underground or rear parking; and
- Enhanced streetscapes to be more pedestrian and transit-rider friendly.

3.2.1.2 Columbia Pike Land Use and Housing Study

The Columbia Pike Land Use and Housing Study provided a financial analysis of the redevelopment of prototypical housing sites to help determine whether the corridor's current housing affordability and diversity post-streetcar

could be maintained. The financial model evaluated redevelopment of existing units as well as infill redevelopment by comparing the costs of development to the expected future income from rents or sales. The analysis made several assumptions about the future conditions of the Columbia Pike corridor, including the operation of the streetcar. Variables tested for the sites included density, height, parking ratios, and building type. The hypothetical redevelopments were analyzed to determine how well each site could simultaneously meet the goals of the *Land Use and Housing Study* and retain 100 percent of the current market rate affordable units. Almost half of the affordable units along Columbia Pike are located in family-owned complexes that have indicated their desire to maintain these units as affordable in the long-term.

Key findings for the four sites included:

- The financial ability to increase density is constrained by the value of the existing units.
- Replacing surface parking with structured parking imposes significant costs that inhibit the provision of affordable housing and scale of development.
- Mid-rise buildings have higher costs and demands for structured parking.
- Rents along the Pike do not support construction costs of mid- or high-rise complexes or their associated parking.
- Height is not the cure, at least not in the near term.
- It is unrealistic in today's market to replace a mid-rise complex.
- Increasing density creates value, even through infill.
- More value is created in townhouse ownership versus renting townhomes.

Without public intervention, and with or without new transit investment, the study concluded that the number of affordable housing units available in the corridor will shrink considerably, which may force current occupants to move out of Arlington, spend even more of their limited income on housing, or consolidate their households with households of family or friends. Interviews confirmed this assertion, finding that real estate trusts are aggressively pursuing investments and driving up the costs in the corridor, aging infrastructure along the corridor increases redevelopment costs, and certain design guidelines and standards in the corridor actually limit the inclusion of more affordable housing developments.

The redevelopment of existing garden units is one of the more financially feasible development opportunities, and therefore, is also one of the larger threats to the ability of the corridor to maintain affordable housing. Another threat to affordable housing is the development of for-sale townhouses through the demolition of existing garden apartments, which generates greater returns than any of the rental scenarios examined. Strategies and policies will have to be developed to help shape these redevelopment opportunities so that they also include affordable housing components.

The study also found that high-rise and mid-rise residential developments (greater than 6 stories) are not feasible under current and generally anticipated market conditions. Future conditions may change as rents increase or new technologies are developed that make mid-rise and high-rise development more affordable. According to developers, redevelopment under current conditions is only financially feasible when the new construction replaces the existing units by three to one in low-rise developments (less than 6 stories) – assuming below ground parking is not required.

3.2.1.3 Columbia Pike Neighborhoods Area Plan

The Columbia Pike Neighborhoods Area Plan Policy Framework draft was written in October 2011 and the final Neighborhoods Area Plan was released in April 2012 to help guide the residential developments along Columbia Pike in Arlington, Virginia. The goals included encouraging healthy, diverse communities; stabilizing the existing neighborhoods while encouraging economic growth and mixed-use centers; expanding housing options that preserve affordability; providing a safe, pedestrian-friendly multimodal corridor; preserving character and history; enhancing urban design; and incorporating sustainable and efficient designs. The *Neighborhoods Area Plan* provides a set of directives taking into account existing conditions and community input. In the Plan are recommendations to encourage residential development and redevelopment between the commercial revitalization district nodes along Columbia Pike.

The study investigated ways that the County can encourage the types of growth that the community and corridor are seeking. Reducing property taxes for affordable housing units was suggested, but would require state approval, which could take years and ultimately end unsuccessfully. Other incentives to maintain and encourage developers to provide affordable housing were recommended, including increasing the subsidies to building owners who commit to specified levels of market affordable housing. Different forms of tax exemption have been used in various areas of the country with success, and these models could be used in the corridor to ensure developers are subsidized for maintaining their affordable housing units. Affordable Housing Investment Fund (AHIF) loans are available to non-profit developers to purchase housing and maintain at least a portion of it as affordable for 30 years or more. To encourage economic development along the corridor, the plan recommends that the housing

stock be increased, concentrating denser units around the streetcar stops. The retail and commercial uses should be concentrated in the commercial centers (nodes). The study states that an increase in the residential market on the corridor will directly help attract new businesses, restaurants, entertainment, and services. Ensuring an economically sustainable corridor can be achieved in part by generating sufficient economic value through tax revenues and community benefits (Arlington County, *Columbia Pike Neighborhoods Plan,* 2011).

The Columbia Pike Neighborhoods Area Plan Policy Framework draft was written to help guide the neighborhood development along Columbia Pike. The goals include:

- Encouraging healthy, diverse communities;
- Stabilizing the existing neighborhoods, while encouraging economic growth and mixed-use centers;
- Expanding housing options that preserve affordability;
- Providing a safe pedestrian-friendly multimodal corridor;
- Preserving character and history;
- Enhancing urban design; and
- Incorporating sustainable and efficient designs.

The *Policy Framework* provides a set of directives that take into account existing conditions and community input, which will be the basis of the *Neighborhoods Area Plan*; the *Neighborhoods Area Plan* aims to prescribe the development and redevelopment that will occur between the revitalization district nodes along Columbia Pike.

To confirm that the desired goals and objectives for the corridor are feasible, the *Policy Framework* undertook a preliminary analysis of prototypical sites along the corridor. This analysis looked at topography, street and pedestrian access, availability of and access to green spaces, as well as market conditions to get an understanding of the types of improvements necessary to make the corridor more connected. The study also conducted interviews with Columbia Pike property owners and regional developers to gain a better understanding of the existing market conditions. It found that affordability and higher densities are possible along Columbia Pike. However, significant redevelopment is unlikely under current zoning regulations. Completely demolishing and replacing structures is only feasible if higher densities were allowed, so it is more likely that the existing structures will be renovated. Zoning changes will be essential, and developers will need to utilize subsidies to ensure affordable housing remains a priority. Figure 3-3 shows the Columbia Pike corridor's current land uses and commercial centers.

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Figure 3-3. Columbia Pike Land Use and Commercial Centers

SCALE IN FEET
0 1,000 2,000 3,000 4,000

0 0.25 0.5 0.75 1
SCALE IN MILES

Columbia Pike

Adopted Plan: Columbia Pike Initiative - A Revitalization Plan, 2002/Columbia Pike Form Based Code, 2003.

Corridor Concept: Mixed-use development districts, oriented to Columbia Pike (linked by residential transitional areas and open spaces) and primarily consisting of office, residential, retail, and cultural uses.

Plan/Form Based Code Features:

Town Center:
- Maximum height of 6 stories
- Incorporate historic structures with heights up to 8 stories
- Creation of public square at Adams Square and Fillmore Garden Shopping Center sites

Village Center:
- Maximum height of 6 stories (except northwest corner which has 54 feet height maximum)
- Day-lighting of Doctor's Run (south of development district)

Neighborhood Center:
- Maximum height of 4 stories east of Four Mile Run, oriented to park and Columbia Pike
- Maximum height of 6 stories west of Four Mile Run

Western Gateway:
- Maximum height of 6 stories except 10 stories on the south side of Columbia Pike at S. Greenbrier Street.

Special Planning Districts: "Columbia Pike Special Revitalization District".

Neighborhood Conservation Plan Areas: Arlington View (Plan accepted 1965); Penrose (Plan accepted 1967 and updated 2004); Arlington Heights (Plan accepted 1980 and updated 2008); Douglas Park (Plan accepted 1998); Alcova Heights (Plan accepted 1999); Barcroft (Plan accepted 1990); Claremont (Plan accepted 1990); Columbia Forest (Plan accepted 2000); Columbia Heights West (Plan accepted 2000); Columbia Heights (Plan accepted 2004).

Legend

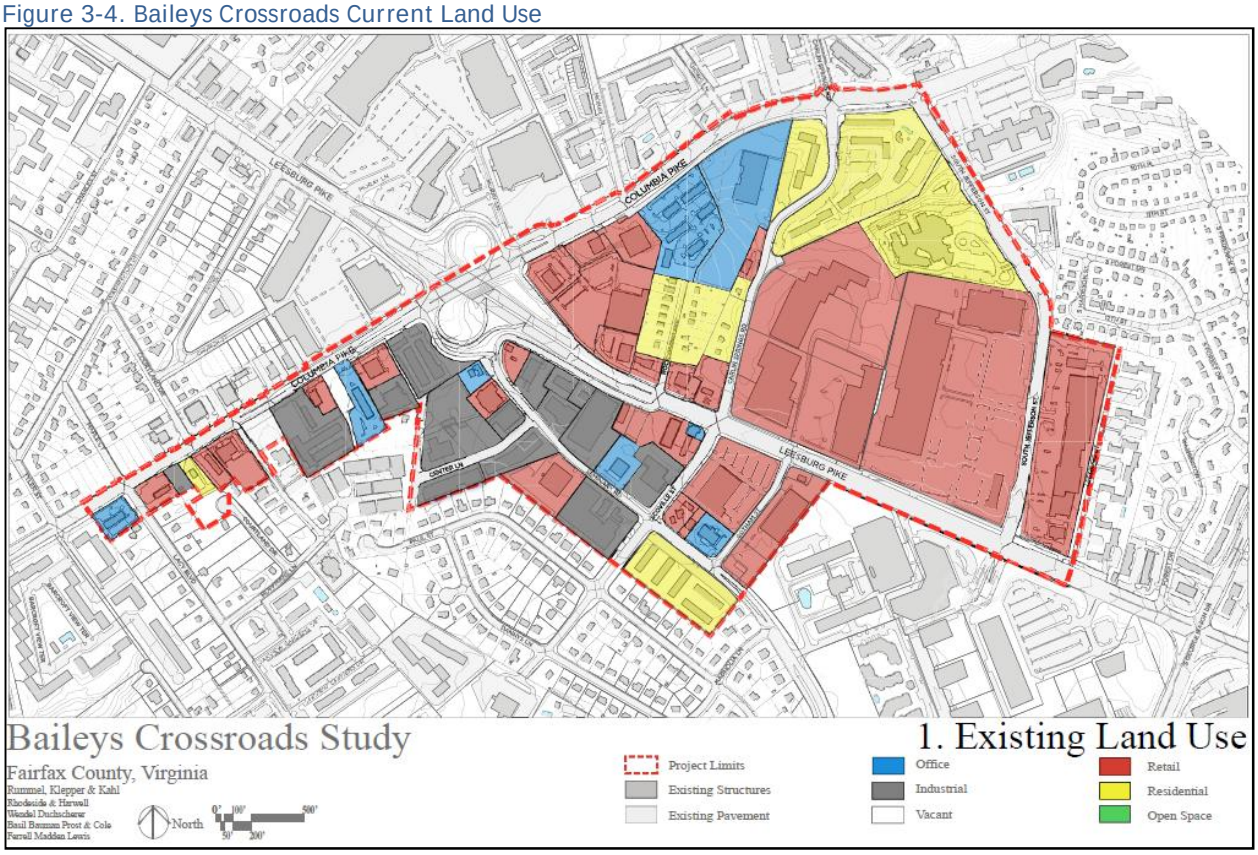
Land Use Category**	Range of Density/Typical Use	Zoning*
Residential		
Low	1-10 units per acre	R-20, R-10, R-10T, R-8, R-6, R-5
Low	11-15 units per acre	R2-7, R15-30T
Low-Medium	16-36 units per acre	R-15-30T, RA14-26, RA8-18
Medium	Up to 37-72 units per acre	RA7-16, RA6-15, RA-H
High-Medium	Up to 3.24 F.A.R. *(Floor Area Ratio)* Residential	RA-4.8
High	Up to 4.8 F.A.R. Residential Up to 3.8 F.A.R. Hotel	RA-H-3.2, C-O Rosslyn
Commercial and Industrial		
Service Commercial	Personal and business services. Generally one to four stories, with special provisions within the Columbia Pike Special Revitalization District.	C-1-R, C-1, C-1-O, C-2, C-O-1.0
General Commercial	Shopper goods and other major mixed commercial uses, including offices. Generally a maximum of seven stories.	C-2, C-TH, C-3
Service Industry	Wholesale, storage, and light manufacturing uses, including those relating to building construction activity.	C-M, M-1, M-2
Public and Semi-Public		
Public	Parks *(Local, regional, and federal)*. Schools *(public)*. Parkways, major unpaved rights-of-way. Libraries and cultural facilities.	S-3A, S-D
Semi-Public	Country clubs and semi-public recreational facilities. Churches, private schools and private cemeteries *(predominant use on block)*.	S-3A, S-D
Government and Community Facilities	County, state and federal administration and service facilities *(police, fire, property yard, etc.)*. Hospitals, nursing homes, and institutional housing. Utilities, military reservations, airports, etc.	P-S, S-D, S-3A
Office-Apartment-Hotel		
	Office Density / Apartment Density / Hotel Density	
Low	Up to 1.5 F.A.R. / Up to 72 units/acre / Up to 180 units/acre	C-O-1.5, C-O-1.0
Medium	Up to 2.5 F.A.R. / Up to 135 units/acre / Up to 180 units/acre	C-O-2.5
High	Up to 3.8 F.A.R. / Up to 4.8 F.A.R. / Up to 3.8 F.A.R.	C-O, RA-H-3.2, C-O Rosslyn
Mixed Use		
Medium Density Mixed-Use	Up to 3.0 F.A.R. with special provision for additional density within the "Clarendon Revitalization District" (See Note 12) and the "Special Coordinated Mixed Use District" for East End of Virginia Square (See Note 3)	C-R, C-3, ME-VS
High-Medium Residential Mixed-Use	Up to 3.24 F.A.R. including associated office and retail activities.	R-C
Coordinated Mixed-Use Development District	This is a high density mixed-use district with actual density determined by site size. Up to 6.0 F.A.R. with office not more than 3.0 F.A.R.	C-O-A

Source: Arlington County General Land Use Plan Amendments

3.2.1.4 Baileys Crossroads Planning Study

As Baileys Crossroads redevelops, the future developments will incorporate mixed-uses at higher densities than what is currently in the area. These increased densities will result in higher traffic volumes that will induce lower levels of service both along arterials and at intersections. Improvements to the local road networks will need to be done in preparation for the higher traffic. The proposed Columbia Pike Streetcar line is included in the future scenarios analyzed for the Baileys Crossroads area, and the induced development in the immediate vicinity of the stop along South Jefferson Street is assumed to be the densest, consistent with traditional Transit Oriented Development (TOD). In analyzing future traffic volumes, a vehicle trip reduction rate of 30 percent was applied due to the TOD-like development. This reduction factor was appropriate because of the transit improvements that will occur in the study area and the increased connectivity for pedestrians. A reduction of 25 percent was approved for the blocks outside of the TOD core as well (Fairfax County, Baileys Crossroads Planning Study, 2010). Figure 3-4 shows the current land use.

Figure 3-4. Baileys Crossroads Current Land Use



Source: Baileys Crossroads Planning Study by Fairfax County

3.2.1.5 Fairfax County Comprehensive Plan

Fairfax County recognizes the importance of the commercial activity at the heart of the Baileys Crossroads CBC and is committed to restoring its vitality through commercial revitalization as described in the *Fairfax County Comprehensive Plan* for the Baileys Planning District. Adopted in 2011, the Plan focuses on the retention, redevelopment, and revitalization of the existing community-serving retail uses. However, the vision for future development also includes a "pedestrian-oriented, mixed-use development with a pedestrian scale and urban character that will complement the adjacent residential areas and promote transit usage," (Fairfax County Comprehensive Plan, 2011). The County includes the following objectives for the Baileys Planning District:

- Improve the appearance and function of the Business Center through coordination of land uses, unified signage, consolidation of curb cuts, landscaping treatment, and provision of pedestrian-oriented amenities,
- Encourage pedestrian access to and from retail areas,
- Establish a clearly defined 'edge' between commercial and residential areas, and
- Encourage the creation of additional parks, open space, and recreation areas.[10]

Similar to Columbia Pike, many of these objectives are designed to encourage "place making." The county would like Baileys Crossroads to become an attractive, diverse, and vibrant area for living, working, shopping, and relaxing. To realize this vision, the county is encouraging the development and revitalization of the area to be compact and pedestrian/bicycle-friendly. Additionally, multi-modal usage will be promoted by providing convenient access for transit, bus, and bicycle users throughout the region. The plan calls for the densest development to be focused near transit stops to promote transit usage and create vibrant mixed-use destinations. The public space will also be enhanced to create a sense of place through a network of streets and open spaces that allow opportunities for walking, playing games, and enjoying the outdoors; recreational and civic uses; and inviting places to eat, shop, stroll, and spend time.

The *Fairfax County Comprehensive Plan* incorporates the Columbia Pike Transit Initiative into its redevelopment goals. A streetcar system would have two stops within the Baileys Planning District, and the plan notes that the areas adjacent to the streetcar line and within ¼ mile of the stations will have the highest potential for increased density. New streets in grid-like patterns are planned to encourage pedestrian safety and reduce traffic on the main arterials. New streetscapes are illustrated to include the streetcar, enhance walkability, add public spaces, and provide for mixed-use redevelopments of retail, office, multi-family residential, and institutional uses.

Future developments are anticipated to be primarily in the commercial centers along the main arterials and surrounded by suburban neighborhoods. An emphasis will be placed on creating a gradual transition between the higher densities in the commercial centers and the low-density single family residential neighborhoods by linking the two with mid-rise residential and institutional uses such as churches and schools.

Aside from the six major objectives for the county as a whole, the plan highlights specific goals for the Baileys Crossroads CBC, in areas such as land use, urban design, transportation, environmental stewardship, heritage resources, public facilities, urban parks and recreation, and implementation sectors. Goals of note related to streetcar implementation include:

- Encourage redevelopment for a mixed-use multi-modal community center through a balance of uses and public spaces;
- Locate the highest densities nearest to transit stops and within ¼ mile of the streetcar line;
- Support a variety of residential unit sizes and types to encourage affordable housing and maintain the current population's diversity;
- Promote high-quality developments;
- Redevelop Leesburg Pike (Route 7) to be a more walkable urban boulevard; and
- Encourage revitalization and economic competitiveness.

A concerted effort towards obtaining these goals in the Baileys Crossroads neighborhood will need to be assisted by changing policies. Specifically, the Virginia Department of Transportation (VDOT) standards regarding pedestrians and street design in suburban areas may need to be updated or changed from the traditional designs.

3.2.1.6 Baileys Crossroads Planning Study: Preferred Concept Transportation Evaluation

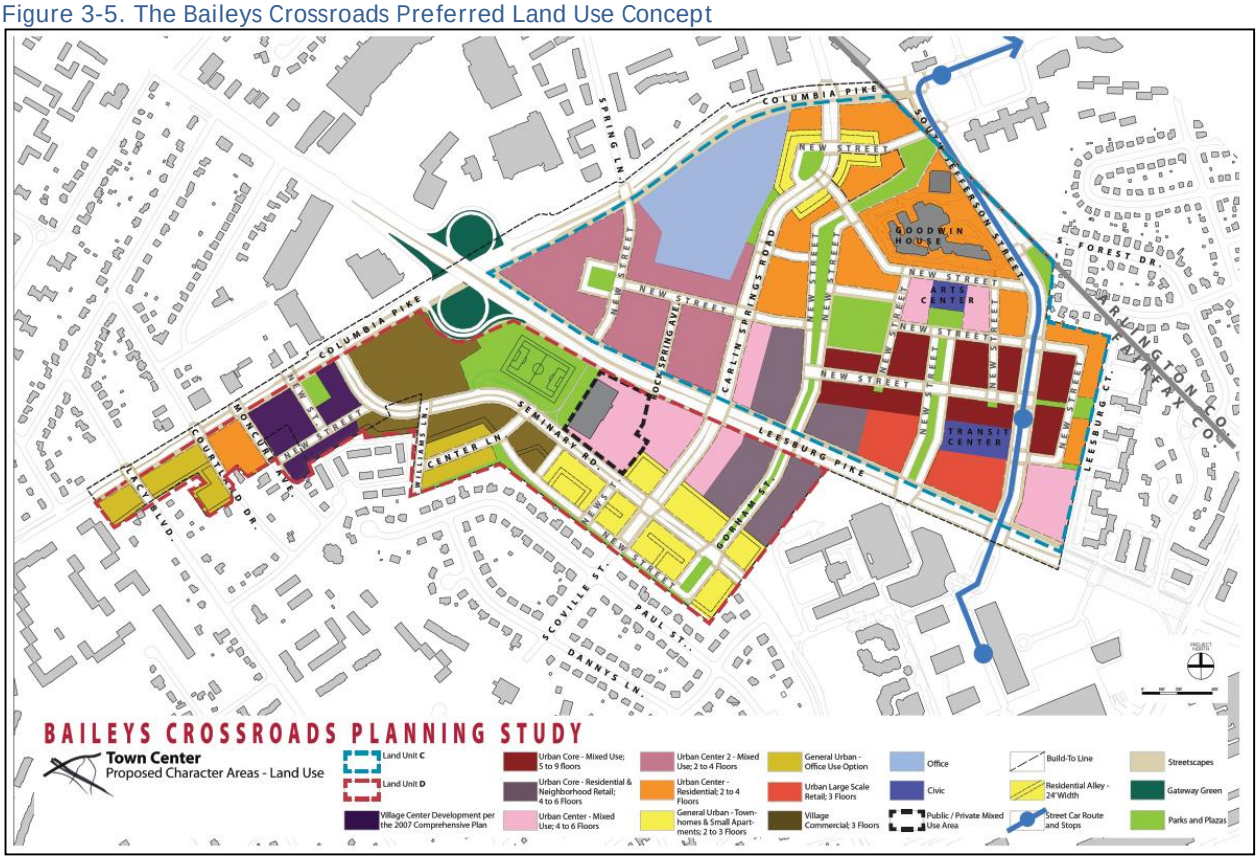
As part of the Baileys Crossroads Preferred Concept Transportation Evaluation, Fairfax County conducted a traffic study to analyze the conditions that would result from the current land use plan and to investigate the potential changes due to streetcar operations and intensification of land use under the Preferred Land Use Concept. The Preferred Land Use Concept assumes a higher density of land use in the study area as compared with the level of

[10] Ibid. Please note that the list is not inclusive of all the objectives listed in the *Comprehensive Plan*.

land use that is included in the *Fairfax County Comprehensive Plan* at that time. The Preferred Concept assumes roadway network improvements (including adjusting lane dedications and signal timing, as needed) and traffic impact mitigation improvements on top of those that are already approved in the *Comprehensive Plan*. It also includes the proposed Columbia Pike Streetcar line terminating in the Skyline complex and a Transportation Center on South Jefferson Street, within the Baileys Crossroads planning district. The Preferred Concept has a higher floor area ratio (FAR) resulting in a higher density of development, and incorporates TOD patterns, particularly near streetcar stops. Figure 3-5 shows the land uses incorporated in the Preferred Concept.

The current conditions show that the Baileys Crossroads area has only one location with an unacceptable LOS, but the conditions in 2030, both with and without signal optimization, have increased levels of traffic due to the new developments and increased densities. The increased development induced by the *Preferred Concept Plan* will increase traffic congestion, resulting in the need for signal modifications and street improvements to ensure that travel speeds and the LOS remain acceptable. The Baileys Crossroads area plans focus on the streetcar in terms of its effect on transportation in the area. The neighborhood plans to redevelop with the highest densities immediately adjacent to streetcar stops and gradually decreasing densities as the distance from stops increases. The neighborhood anticipates a 30 percent reduction in trips due to the envisioned mix of land uses and walkability of the proposed TOD, though traffic in the area is predicted to increase overall. Similarly, the county has set a goal of reducing trips by 25 percent outside of the ¼ mile radius of stations.

Figure 3-5. The Baileys Crossroads Preferred Land Use Concept



Source: FairfaxCounty.gov

3.3 Future Plans Incorporating Streetcar

Both the Baileys Crossroads and Columbia Pike planning efforts have considered a streetcar system as part of their redevelopment and transportation planning efforts. In so doing, they have identified both challenges and goals associated with the investment. In preparation for the development changes expected in response to operation of the streetcar, Arlington County has developed a FBC that can be used to expedite the building approvals process along the corridor and dictate the new urban form. Additionally, Fairfax County has studied the expected effects on traffic in the Baileys Crossroads area as a result of the streetcar and its own proposed redevelopment plan. The neighborhood plans recognize that a Streetcar Project would make living and working along the corridor more attractive so it is necessary to have the right tools and policies in place to ensure that the existing populations can remain in the area and experience the benefits associated with these changes.

3.3.1 Common Challenges

As inner suburbs of the Washington, D.C. metropolitan area, the corridors have similar existing characteristics and challenges. They both traditionally have been home to lower-income populations that depend on MARKS. However, due to revitalization plans and new transit initiatives, the neighborhoods will soon be changing and these changes threaten the balance of affordable housing in the region. The areas are also victims of poor planning, as they are not well accessed by high quality transit, have limited pedestrian and bicycle facilities, and are lacking commercial investments.

Arlington and Fairfax Counties are interested in how to redevelop along the Columbia Pike corridor and into Baileys Crossroads while still maintaining the community qualities that the residents value: affordable housing and a diverse population. The fear is that with anticipated increases in employment and new market rate housing, the neighborhoods will not be able to keep up with the demand for affordable housing.

Redevelopment of housing along the corridor is likely to remain low-rise (less than 6 stories). However, as rents increase and the area becomes more desirable due to the streetscape, streetcar, and other improvements, affordable housing could be at risk unless measures are taken to encourage the inclusion of affordable housing units with redevelopment opportunities.

Challenges for the Columbia Pike area include:

- New development conforming to the FBC;
- Diminishing capacity of Committed Affordable Units (CAFs) and MARKS, predicted to be 23 percent fewer by 2040;
- Overcrowding; and
- Lack of funds to assist MARKS owners in maintaining their units or purchasing new MARKS.

The Baileys Crossroads neighborhood has many of the same challenges as Columbia Pike, including:

- Maintaining affordable housing is not an explicit goal in the redevelopment plan, so there are no tools to encourage its preservation;
- Elimination in FY2009 of the Pennies for Housing program that dedicated one cent of the real estate tax to be used for affordable housing;
- 93 percent of the units are 40 years old or more;
- 73 percent are garden style, which is a lower density than would be preferred; and
- Low accessibility to public transportation due to the inefficient road networks.

3.3.2 Common Goals

Columbia Pike and Baileys Crossroads have experienced a loss of affordable housing units, while the population that needs these units is expected to continue to increase. With the proposed streetcar project, the potential redevelopment opportunities could increase land values and encourage developers to raise rents, thereby further reducing the affordable housing stock in both neighborhoods. Maintaining existing units and attracting new developments with affordable housing has been difficult because of limited funding and incentives for developers. However, as the neighborhoods redevelop and their economic and transportation environments improve, maintaining the stock of affordable housing should not be neglected.

Besides maintaining the affordable housing stock, both areas have plans for how the streetcar will affect the physical developments. Aside from the affordable housing goals, revitalization and redevelopment of the Columbia Pike corridor has been a focus since the 1980s, resulting in:

- Zoning and land use regulations to create the new “Main Street” of South Arlington through the adoption of the FBC in 2003;
- Improving the streetscapes to create a more walkable and transit-accessible community;

- Proposing improved transportation along the corridor through a streetcar, enhanced bus, or Metrorail service; and
- Maintaining and increasing the stock of affordable housing to encourage continued diversity.

The Baileys Crossroads area has begun redevelopment in anticipation of the Columbia Pike streetcar implementation. Goals for the area include:

- Redeveloping the main strip from a retail center to mixed-use;
- Reconstructing the street network to connect areas better and provide space for all modes;
- Decreasing the amount of available surface parking and increasing the amount of green space; and
- Planning for additional schools and emergency services to serve the increasing population.

3.4 Affordable Housing Considerations

Both Columbia Pike and Baileys Crossroads have experienced a loss of affordable housing units even as planners expect an increase in the population that would need them. With the proposed streetcar project, the potential redevelopment could increase land values and encourage developers to raise rents, thereby further reducing the affordable housing stock in both neighborhoods. Maintaining the existing units and attracting new developments of affordable housing has been difficult because of limited funding and incentives for developers. However, as the neighborhoods redevelop and improve their economic and transportation situations, maintaining the stock of affordable housing should not be neglected (Rodgers, Charting a Way Forward, 2011).

The stock of CAFs and MARKS has fluctuated since 2000. As of 2010, there were 9,538 rentals along Columbia Pike, and only 15 percent were at market rate. The remaining 85 percent were affordable – a much higher portion than the average of Arlington, 57 percent. The Columbia Pike Transit Initiative estimates that 6,425 additional market rate units will be added to the corridor by 2040 (Arlington County, Columbia Pike Neighborhoods Area Plan, 2012). Fairfax County has also been losing affordable housing, with 8,000 rental units of affordable housing to 70 percent of AMI available in 2002 being lost by 2010.

Without public intervention, the number of affordable housing units available in the corridor will shrink considerably, which will either force current occupants to move out of Arlington, spend even more of their limited income on housing, or consolidate their households with households of family or friends. Real estate trusts are aggressively pursuing investments and driving up the costs in the corridor; aging infrastructure along the corridor increases redevelopment costs; and certain design guidelines and standards in the corridor actually limit the inclusion of more affordable housing developments.

Constructing new high-rise and mid-rise residential developments (greater than 6 stories) and including affordable units is not feasible under current and generally anticipated market conditions. Future conditions may change as rents increase or new technologies are developed that make mid-rise and high-rise construction more affordable. Redevelopment under current conditions is most cost effective when new construction replaces the existing units by three to one[11] for low-rise developments (less than 6 stories) – assuming below ground parking is not required (Arlington County, Columbia Pike Neighborhoods Area Plan, 2011).

Challenges to support affordable housing for developers and the counties exist on both Columbia Pike and in Baileys Crossroads. Issues include: new developments are encouraged to conform to the FBC in Arlington County; there is a diminishing capacity of CAFs and MARKS, with the supply expected to diminish by 23 percent by 2040 (Rodgers, op cit.); overcrowding; and a lack of funds to assist MARKS owners in maintaining their units or purchasing new MARKS. Additionally, parking regulations may be higher than necessary in the corridor and density allowances are too low to make developments profitable for developers.

Another challenge to financing affordable housing is the elimination of the Pennies for Housing program that dedicated one cent of the real estate tax to be used for affordable housing. However, solutions do exist. Fairfax County should include a provision for rental units within one mile of the plan's boundaries to constitute a percentage of affordable housing; quantify goals for subsidized and non-subsidized affordable housing; set more aggressive targets to meet existing needs; and establish a plan and develop tools to achieve the new goals (Rodgers, op cit.).

Developers would be supportive of an increase in density regulations, especially in residential zones if the complex maintains a specified percentage of affordable housing units. Developers are also enticed by a reduction in property taxes, particularly for affordable units; and lower financing rates. There are numerous challenges for preserving – and attracting- affordable housing along the corridor, but there is a solution to be had if both of the

[11] Also discussed in Developer Workshop.

counties and developers can make compromises. Maintaining the corridor's character and historic affordability in concert with new developments will shape the Columbia Pike corridor as the counties have envisioned.

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4. Literature Review

4.1 Summary of Documents Reviewed

The literature reviewed for the Columbia Pike Transit Initiative ROI study identified the following benefits associated with the operation of a streetcar: enhanced accessibility, greater connectivity to the regional transit network, reduction in transportation costs, attraction of employment opportunities and residents, redevelopment and gentrification, and an increase in tax revenues. These benefits and how they relate to the Columbia Pike Transit Initiative Corridor are summarized in the sections that follow.

It is widely reported in the literature that properties adjacent to and extending up to ½-mile from high quality transit lines experience an increase in value due to transit accessibility. This higher value property expands the local property tax base, generating greater tax revenues for the region. This increase in property tax revenues generated by the transit investment then can be used to fund construction (referred to as value capture), ongoing operations and maintenance expenses, or other public investments or ongoing expenses as the property values, and therefore tax revenues, will remain higher into the foreseeable future. The increment by which the value of parcels located within the transit corridor is increased is the property premium discussed in this literature review.

Just as there are benefits to the region with a new streetcar line, the literature review emphasized that there are also costs. The costs include not only the construction and operation of the new system, but any negative impacts to the current community, such as construction closures, dislocation, and noise. A common cost discussed in the literature was the ability/inability to maintain the current stock of affordable housing in the corridor. The transit investment and induced property premiums tend to bring higher rents and costs associated with living in the transit investment corridor. These higher costs negatively affect affordable housing rates because developers are more likely to redevelop their properties and rent to higher-paying clients. This concern resonates with the project because the transit investment corridor has a diverse mix of populations, some of which potentially could be negatively affected by the transit investment's induced redevelopment. As a result, it is important to consider these populations and the project's potential costs when discussing and implementing new policies for redevelopment.

4.1.1 Selection of Documents

The literature reviewed for the Columbia Pike Transit Initiative ROI study primarily fell into four categories:

- *Documents showing links among transit, walkability, and economic value*: There is a growing body of reports and academic studies that assess the relationships among the physical design of neighborhoods, accessibility elements that promote walkability, and the economic value of such places.
- *Documents discussing the property premium due to transit*: The reports on property premiums were either literature reviews of results estimated or seen by other systems, or were before-and-after studies on actual premiums experienced in transit corridors. Additionally, two studies utilized developer surveys to assess their thoughts and opinions on redevelopment patterns, expectations, and property premiums due to transit investments (Cincinnati Streetcar, 2007; TCRP Synthesis 86, 2010). The surveys were meant to confirm the expected premiums through local market experiences.
- *Policies that help encourage development along streetcar corridors:* The local neighborhood plans and property premium reports discussed policies that municipalities used to support development, maintain affordable housing, support TOD, and walkability.
- *Studies analyzing the funding mechanisms available to construct and maintain streetcar projects*: Funding sources were listed primarily as a literature review of other systems and were discussed in numerous reports as a means of both providing for the initial construction costs and the ongoing operation and maintenance of the systems.

The findings for each of the documentation categories are summarized in the sections that follow. The findings are discussed in terms of how they relate to the Columbia Pike Transit Initiative project.

4.2 Transit, Walkability, and Economic Value

Walkability has been at the forefront of smart-growth principles as it describes the ease of accessing a variety of retail, commercial, and public destinations by foot. Walkability is closely tied to the built environment, which includes both transportation and building developments. Portland, Oregon, has coined the name "20-minute neighborhood" for such areas: places with 1) a walkable environment, 2) destinations that support a range of daily needs (shop, parks, jobs), and 3) residential density. Collectively, these attributes reduce the need for car trips for a share of a typical household's trips (City of Portland, Twenty-minute Neighborhoods, 2009).

Walkability can be measured numerically through a Walk Score and has been found to correlate with property values. In one study, the web-based Walk Score algorithm developed by Front Seat was used to compare the effect of walkability on 93,725 home sales in 15 markets in the United States from 2006 to 2008. The study indicated that the walkability of a neighborhood is directly tied to the price, and homes with better than average walkability scores are worth $4,000-$34,000 more than comparable homes with less than average walkability (Cortright, Walking the Walk, 2009). More specifically, of the 15 markets investigated, 13 showed a positive correlation between higher walkability and an increase in home values. Walkability has a higher effect on price, however, in more populous and denser cities, which also tend to have larger public transportation systems. In Arlington, the median Walk Score is 71 and the 75th percentile is 82. A home in the 75th percentile is worth $19,028 more than a home with the median walkability score. According to walkscore.com, the Columbia Pike corridor currently has a Walk Score of 78.

Few studies look specifically at walkability relating to home prices, but the those mentioned here measure aspects closely tied to walkability. A study in Austin, TX found that home prices rise by $8,000 per mile as they get closer to the central business district (CBD) and similarly rise by $4,700 per minute saved in daily commute travel time. A study in Portland, OR found that homes built before 1940 appreciated more than those constructed after 1940, showing that the grid street-pattern typical of that time is preferred to the windy cul-de-sacs found in subdivisions built after 1940. Studies have found that buyers are willing to pay 4 percent to 15 percent more for homes located in areas with grid-like streets, mixed-use amenities, and higher densities.

To help maximize the property premium that could be expected along the Columbia Pike corridor, the literature also recommends adding additional public or private investments that make the corridor more walkable. One way to improve urban form and walkability in the streetcar corridor is to further extend the grid street pattern and incorporate green space. Walkability is seen as a positive neighborhood attribute and can contribute to better health, lower transportation costs, lower congestion, and higher property values.

4.3 Property Premiums

Streetcar is one of many modes analyzed for property premiums resulting from improved access to high quality transit. However, given the recent revival of the streetcar mode, studies that measure its effects on property values and development growth are relatively limited. Since it is closely related to light rail, this mode often has been used as a comparable equivalent in studies. Many of the streetcar studies reviewed analyzed streetcar as well as light rail systems' effects on a region's transportation system and economic development. As a result, these light rail premiums are used in several of the documents but are also assumed to be somewhat higher than a streetcar premium would be because light rail is generally higher capacity than streetcar, with longer routes and segments of dedicated right-of-way.

A survey conducted by the Transit Cooperative Research Program (TCRP) revealed that nearly all of the developers felt that the streetcar project in their city had a positive effect on the city's built environment (TCRP Synthesis 86, 2010). However, the significance of the effect varied greatly by city, property type, and study area (adjacent, ¼ mile, etc.). A summary of the property premiums discussed in the reviewed documents is found in Table 4-1 and shows an average range from 2 percent to 41 percent across all property types within a ¼ mile of the alignment, and a range of 4 percent to 12 percent for studies estimating the potential impacts of new streetcar service. It should be noted, however, that many of these premiums, particularly those based on averages from multiple cities, include cities with light rail service.

Peer cities with streetcar systems include: Tampa, Seattle, Savannah, Kenosha (Wisconsin), Memphis, and Portland. These cities experienced successful redevelopment in conjunction with other infrastructure improvements in the corridors, including zoning and density regulations (Portland) and joint development (Memphis).

The cities that experienced the greatest growth in development and redevelopment associated with streetcar projects had areas of underutilized industrial parcels, vacant parcels, and large parcels with only a few developers in play. Industrial sections of cities are often ripe with opportunities for redevelopment because they have mostly been abandoned (Cincinnati Streetcar, 2007; TCRP Synthesis 86, 2010; Portland Streetcar Development, 2008). Similarly, vacant areas with new routes (Tampa, Seattle, and Portland) saw very high property value increases.

Streetcar lines that also experienced dense growth and high premiums tended to be part of a larger overall transit system that included light rail, heavy rail, and/or extensive bus networks (Portland) as opposed to a single line or circuit that did not connect to other modes. The literature has found that placing streetcar lines in these areas increases the probability and eventual density of redevelopment, assuming zoning laws will permit it.

Table 4-1. Streetcar Property Premiums Experienced or Expected by Property Type

Property Type	Premium		Actual/Estimate	Impact Area	City	Study
	Low	High				
Residential						
	5%	12%	Estimate	1/4 mile	Washington, DC	DC Streetcar Land Use, Goody Clancy 2012
		6%	Estimate		Cincinnati	Cincinnati Streetcar TIGER III, 2011
	2%	32%	Actual	200 ft and 100 ft		TCRP Synthesis 86, 2010
	2%	35%	Estimate		Charlotte	Charlotte Streetcar, 2009
		756%	Actual (2002-2008)		Memphis	TCRP Synthesis 86, 2010
		10%	Actual for SF (1997-2003)	< 0.5 acres	Portland	Value Capture, Brookings Institution et al 2009
		20%	Actual for SF (2003-2008)	< 0.5 acres	Portland	Value Capture, Brookings Institution et al 2009
		-26%	Actual for SF (2002-2008)	< 0.5 acres	Tampa	Value Capture, Brookings Institution et al 2009
	4%	*18%*	*Estimate*		*Average*	
	2%	*9%*	*Actual*		*Average*	*Excludes Memphis (outlier)*
Multifamily (Condos/Rentals)						
	0%	45%	Actual	1/2 mile and 1/4 mile		TCRP Synthesis 86, 2010
		26%	Actual (2002-2008)		Tampa	Value Capture, Brookings Institution et al 2009
		3%	Actual (2003-2008)		Seattle	Value Capture, Brookings Institution et al 2009
		36%	Actual (2003-2008)		Portland	Value Capture, Brookings Institution et al 2009
		19%	Actual (1997-2003)		Portland	Value Capture, Brookings Institution et al 2009
		3%	Estimate		Cincinnati	Cincinnati Streetcar TIGER III, 2011
	2%	18%	Actual	1/2 mile	Various	TCRP Synthesis 86, 2010
		3%	*Estimate*		*Average*	
	1%	*24%*	*Actual*		*Average*	
Office						
	2%	10%	Estimate for existing	1/4 mile	Washington, DC	DC Streetcar Land Use, Goody Clancy 2012
		15%	Estimate for demand	1/4 mile	Washington, DC	DC Streetcar Land Use, Goody Clancy 2012
	9%	120%	Actual	1/4 mile to 300 ft		TCRP Synthesis 86, 2010
		-36%	Actual (2002-2008)		Tampa	Value Capture, Brookings Institution et al 2009
		13%	Actual (2003-2008)		Seattle	Value Capture, Brookings Institution et al 2009
	2%	*13%*	*Estimate*		*Average*	
	9%	*32%*	*Actual*		*Average*	
Commercial						
	5%	10%	Corridor-wide estimate	1/4 mile	Washington, DC	DC Streetcar Land Use, Goody Clancy 2012
		9%	Estimate		Cincinnati	Cincinnati Streetcar TIGER III, 2011
		63%	Actual (1997-2003)		Portland	Value Capture, Brookings Institution et al 2009
		(-%)	Actual (2002-2008)		Memphis	TCRP Synthesis 86, 2010
	5%	*9%*	*Estimate*		*Average*	
	na	*na*	*Actual*		*Average*	

Property Type	Premium		Actual/Estimate	Impact Area	City	Study
	Low	High				
Hotel						
		6%	Actual (2003-2008)		Seattle	Value Capture, Brookings Institution et al 2009
		35%	Actual (2002-2008)		Tampa	Value Capture, Brookings Institution et al 2009
		21%	*Actual*		*Average*	
Retail						
	1%	167%	Actual	500 ft to 200 ft		TCRP Synthesis 86, 2010
		15%	Actual (2003-2008)		Seattle	Value Capture, Brookings Institution et al 2009
		-14%	Actual (2002-2008)		Tampa	Value Capture, Brookings Institution et al 2009
	1%	*56%*	*Actual*		*Average*	
Mixed-Use						
		35%	Actual (2003-2008)		Seattle	Value Capture, Brookings Institution et al 2009
		-28%	Actual (2002-2008)		Tampa	Value Capture, Brookings Institution et al 2009
		4%	*Actual*		*Average*	
Industrial						
		29%	Actual (1997-2003)		Portland	Value Capture, Brookings Institution et al 2009
		6%	Actual (2003-2008)		Portland	Value Capture, Brookings Institution et al 2009
		8%	Actual (2003-2008)		Seattle	Value Capture, Brookings Institution et al 2009
		-10%	Actual (2002-2008)		Tampa	Value Capture, Brookings Institution et al 2009
		8%	*Actual*		*Average*	
Vacant Land						
		70%	Actual (2003-2008)		Seattle	Value Capture, Brookings Institution et al 2009
		44%	Actual (2003-2008)		Portland	Value Capture, Brookings Institution et al 2009
		76%	Actual (1997-2003)		Portland	Value Capture, Brookings Institution et al 2009
		-61%	Actual (2002-2008)		Tampa	Value Capture, Brookings Institution et al 2009
		55%	Actual (2002-2008)		Memphis	TCRP Synthesis 86, 2010
		37%	*Actual*		*Average*	
Summary Averages For All Property Types						
	3%	*26%*	*Actual*		*Average*	
	4%	*12%*	*Estimate*		*Average*	
	2%	*41%*	*1/4 Mile or Less*		*Average*	

4.4 Policies to Support Development

In order for the Columbia Pike Transit Initiative's proposed streetcar to obtain the highest ROI possible, there are some recommended policies and guidelines that should be followed. Adjusting or updating policies and zoning ordinances can help ensure that the proper development types and forms are constructed and that the community's goals for redevelopment are met.

4.4.1 Recommended Policies to Support Development

To encourage economic development along the corridor, it is recommended that the housing stock is increased along the corridor, concentrating denser units around the streetcar stops. At streetcar stops along Columbia Pike, limited retail and commercial uses may be used, though the majority of their concentration should be in the commercial centers. An increase in the residential market on the corridor will directly help attract new

businesses, restaurants, entertainment, and services. Ensuring an economically sustainable corridor can be achieved in part by generating sufficient economic value through tax revenues and community benefits. The FBC should be utilized in Arlington County to oversee the expected increase in development along Columbia Pike, which would then increase the county's tax base (Arlington County, Columbia Pike Neighborhoods Plan, 2011).

As demonstrated in the literature, other systems that changed development policies to allow for higher densities generally have experienced growth. However, it is also important to note that these densities and FBC requirements must be reasonable and meet local and developer expectations in order to attain desired development goals. The literature review identified several policy changes that could encourage development along the Columbia Pike Transit Initiative corridor, including following the FBC and relaxing density restrictions in Arlington. Similarly, residential development should be encouraged, as it is noted that residential areas can subsequently attract retail, entertainment, and services (Arlington County, Columbia Pike Neighborhoods Plan, 2011).

4.4.1.1 Charlotte Streetcar

For example, the proposed streetcar corridor in Charlotte has high potential for redevelopment, but there is considerably more capacity than demand. This is because the densities have already been increased along the corridor, and not all existing property owners are willing to redevelop their land to the higher regulations immediately. It is important to note that value premiums are difficult to compare before and after because normally the densities are allowed to increase with the transit system. Due to higher density allowances, land values will rise higher and faster than they potentially would if allowances remained the same (Charlotte Streetcar Economic Development Study, 2009). This is something to keep in mind, as not all developers will be willing or able to redevelop immediately or meet these requirements while still providing or meeting affordable housing goals.

4.4.1.2 Portland Streetcar

The success of the city of Portland in linking transportation investments with development can be replicated elsewhere, but requires cities with one or more large development sites and owners who are willing to work together to advance the region/corridor's vision. The city has to provide a stable source of funding for public improvements while the developers have to contribute to the infrastructure cost and commit to building higher density development, including mixed-income housing to meet the city's housing goals. The development agreement in place in Portland tied development densities to public improvements, increasing the minimum housing density incrementally from 15 to 87 units per acre when the Lovejoy Viaduct was deconstructed, to 109 units/acre when the streetcar construction commenced, and 131 units/acre when the first neighborhood park was built. Additionally, the developers contributed $19.4 million towards the streetcar and other critical investments in the corridor through a Local Improvement District (LID) (Portland Streetcar Development Oriented Transit, 2008).

The development along the streetcar corridor in Portland was designed to improve the livability of the corridor, and in addition to higher density and access improvements, the corridor saw public and private efforts to ensure affordable housing, public open spaces, Brownfield redevelopment, high quality urban design, and public art. Design tradeoffs were often made to fit the streetcar into the scale and traffic patterns of the neighborhoods. In addition, the streetcar system was designed to be constructed and operated in a cost effective manner, including using available ROW, constructing essential facilities only, avoiding the costly relocation of utilities, and constructing stations that were similar to bus stops, (Portland Streetcar Development Oriented Transit, 2008). The Portland Streetcar Development Impacts report measured the differences between the density built after the streetcar was constructed and the density previously allowed through zoning standards. Development happened faster and denser, though the development may have been influenced by other factors (TCRP Synthesis 86, 2010).

The *Streetcar-Development Linkage: The Portland Streetcar Loop* report identified four primary economic development criteria that could be evaluated as part of the Small Starts process for streetcar projects. These include:

- Does the regulatory environment uniformly impel higher density development? This criterion should address whether the current zoning allows for density (floor area ratios) that is significantly greater than that of the current development and that the comprehensive plan and zoning allows for mixed use development.
- Do market conditions support higher density? Portland's experience has indicated that market conditions that support higher density include: increasing investment interest, capitalizing on low improvement to land value ratios, encouragement of new development along a proposed alignment, and developer confidence. As a result, this criterion should address how well the corridor meets these market conditions or others that support higher density development.

- What public incentives beyond transit are available to support high density development? Portland's experience demonstrated the importance of public commitment to urban development through the use of:
- *Public-private development agreements.* For the initial streetcar corridor in Portland, density minimums were increased with the implementation of different public investments.
- *Streetscape investments.* Commitment to creating pedestrian-oriented environments is also important. These investments can include traffic calming measures, pedestrian crossings, sidewalk improvements, and connections to bike trails and green spaces.
- *Urban renewal districts.* These districts help generate funding for infrastructure investment as well as parking and roadway improvements that support businesses located along the corridor.

4.4.1.3 DC Streetcar Study

While the benefits estimated by the *District of Columbia Streetcar Land Use Study* are significant, potential market shifts within the District pose a challenge to development patterns. The streetcar could dislocate existing businesses or new business from other non-streetcar areas. This is particularly true for office space, where approximately 10 percent of the SF attracted to the streetcar corridor is likely to be attracted from elsewhere in the District. As a result, the District should begin planning for redevelopment opportunities for locations without direct streetcar access, including:

- Identify development uses that do not seek premium transit locations. Then develop a strategy to direct this investment to neighborhoods outside the streetcar corridors.
- Review the District's zoning and development policy. Make sure that these promote mixed-use and TOD in areas where it has not traditionally occurred.

The anticipated 5 to 12 percent increase in property values along the D.C. streetcar corridors has the potential to dislocate lower income families. The *District of Columbia Streetcar Land Use Study* estimated that nearly 1/3 of subareas have a higher chance of experiencing a strong upward pressure on housing prices, while approximately ½ would face more moderate upward price pressures. As a result, the District should monitor these areas and be prepared to implement measures necessary to promote affordability. The study discussed several strategies the District could undertake to promote and preserve affordable housing, including:

- Mandatory inclusionary zoning. The District's 2009 ordinance would apply to most new housing developments with more than 10 units and would require that more than 8 percent of new units be affordable.
- Use public land. The District could use public land that is vacant or in need of redevelopment for mixed income housing with specific affordability targets. The study identified 240 acres that could be eligible for this type of use.
- Targeted use of tax-credit and other affordable housing funds.
- Preserve existing public, subsidized, and/or other affordable housing.
- Encourage creation of Accessory Dwelling Units (ADUs). Within existing properties, encourage the conversion of basements and garages to apartments in well-established neighborhoods.

4.4.2 Recommended Policies to Support Transit-Oriented Development

As Baileys Crossroads redevelops, the future developments will incorporate mixed-uses at higher densities than what is currently in the area. The proposed Columbia Pike Streetcar line was included in the future scenarios analyzed for the Baileys Crossroads area, and the induced development in the immediate vicinity of the stop along South Jefferson Street is assumed to be the densest, consistent with traditional TODs. The increased levels of development induced by the realization of the *Preferred Concept Plan* will increase traffic congestion, resulting in the need for signal modifications and street improvements to ensure that travel speeds and acceptable levels of service (LOS) are maintained. Changing policies will help obtain these goals in the Baileys Crossroads neighborhood. Specifically, the Virginia Department of Transportation (VDOT) standards regarding pedestrians and street design in suburban areas may need to be updated or changed from the traditional designs (Baileys Crossroads Transportation Plan, 2010).

Similar issues were noted in the *District of Columbia Streetcar Land Use Study* with routing and right-of-way. The streetcar project could cause the loss of some street parking and add to traffic congestion since the streetcars will travel in existing right-of-way. Mitigation measures such as route adjustments, one way streets, coordinated street markings for bikes and streetcars, and alternative parking options should be evaluated.

The *District of Columbia Streetcar Land Use Study* also discussed initial strategies and tools for optimizing land use benefits along the streetcar corridors, which will be explored in more detail during Phase II of the study. These strategies and tools include:

- Make use of existing and new development. This development can support neighborhood retail, redeveloped declining properties, and attract housing and jobs to the corridors.
- Optimize existing and potential land use policies and design guidelines. This will help ensure that zoning supports the development opportunities provided by the streetcar and that the development improves community character and quality. This can include changes in allowable densities, recommendations for changes in land use mix, mandatory inclusionary zoning for affordable housing, and development of design guidelines.
- Coordinate with other transportation investments. Coordinate with other modes, including bike share, to facilitate transfers, share operating lanes and stops, and integrate transportation with the neighboring land uses.
- Improve access to the streetcar for pedestrians and bicyclists. The new development, streets, and sidewalks must be safe and attractive for pedestrians and cyclists to encourage their use.
- Use multiple mechanisms to capture the value of new development to fund construction and/or operation of the system. Consider using the additional property tax revenues generated from increasing the value of existing property as well as new development to issue bonds to fund the construction of the system. The study estimates that benefits of real estate investments associated with the streetcar system could fund at least 40 to 60 percent of the streetcar system's estimated $1.5 billion cost. Additionally, business improvement districts may be formed to help fund construction or operation.

4.4.3 Recommended Policies to Support Affordable Housing

Some policy changes may be necessary in the Columbia Pike corridor to entice developers and owners to maintain the neighborhoods' reputation of being an affordable and culturally diverse area.

Recommendations include:

- Set aggressive goals of affordable units.
- Be flexible in helping private owners to create or maintain their stock in affordable housing.
- Make affordable housing a priority in the redevelopment plans despite a lack of funding.
- Collaborate with neighboring jurisdictions to make complementary regulations and share solutions since the neighborhoods are experiencing similar problems.
- Provide incentives to property owners to maintain their affordable units through sources that require little government involvement.
- Consider curtailing the by-right development of townhomes through zoning changes or amendments.
- Increase density regulations for residential zones if the complex maintains a percentage of affordable housing units because increased density regulations can help reduce the amount of subsidy needed for redevelopment and inclusion of affordable housing.
- Expedite the approval and permit process for affordable housing units.
- The ratio of 0.7 parking spaces per unit is sufficient; the 1.0 space per unit standard would negatively impact costs.
- Eliminate the barrier for ADUs because they can provide affordable housing and provide a mixture of housing options.
- Utilize
- Low-cost multi-family mortgage revenue bonds issued by the Virginia Housing Development Authority (VHDA);
- Low-Income Housing tax Credits (LIHTCs) at 9 percent; and
- Funding from the Affordable Housing Incentive Fund (AHIF) (Arlington County, Columbia Pike Neighborhoods Plan, 2011; Rodgers, Charting a Way Forward, 2011).

Arlington County has some tools in place to maintain its affordable housing, including the Affordable Housing Ordinance that requires developers to either provide affordable units or contribute funding to others who do. The AHIF provides low-interest loans to help developers provide affordable housing, and there are subsidies to support very low-income households. There are some proposed tools that would make it easier for the stock of affordable housing including mixing home-owners and renters on the same property (possibly through ADUs), reducing property taxes to reduce costs for MARKS, providing incentives for energy efficiency in units, and providing financing at lower rates than offered privately.

Suggested ways for Baileys Crossroads to retain its affordable housing stock include incorporating a provision for rental units within one mile of the plan's boundaries to constitute a percentage of affordable housing, quantifying goals for subsidized and non-subsidized affordable housing, setting more aggressive targets to meet existing needs, establishing a plan and developing tools to achieve the new goals, and considering utilizing the same tools as Alexandria and Arlington to create continuity and provide incentives to common developers.

4.5 Funding Mechanisms

Many mechanisms were discussed in the literature reviewed, including TIGER III (Cincinnati, OH), Tax Increment Financing (TIF) (Kenosha, WI; Charlotte, NC; Washington, DC; Portland, OR); Special Assessment Districts; partnerships; value-capture; Small Starts through FTA; and other state and local sources including gas taxes, parking fees, and surcharges. Although funding for the Columbia Pike streetcar is not the focus of this study, the documents reviewed numerous methods that other municipalities had found useful in helping to fund streetcar projects both before and after operation started. Table 4-2 displays some of the financing mechanisms used or considered by peer streetcar systems to fund construction. The amount yielded by the mechanism is noted, as well as the proportion of the project's total capital costs covered.

Table 4-2. Funding Mechanisms Applied for Streetcar Project

Funding Mechanism	Amount	Percent	System Location
Tax Increment Financing (TIF)			
	unknown		Kenosha, Washington
	$21.5 million	21%	Portland, Oregon
TIGER III			
	$10.9 million	7%	Cincinnati, Ohio
Special Assessment District			
Local Improvement Districts (LID)	$19.4 million	19%	Portland, Oregon
Local Improvement Districts (LID)	$25.7 million	49%	Seattle, Washington
Partnership			
Joint Development	$3.02 million	8.70%	Memphis, Tennessee
Value-Capture			
	$8.5 million	16.3%	Seattle, Washington
New Starts/Small Starts through FTA			
	$75 million	30%	Arlington and Fairfax Counties, Virginia
Local Sources			
parking bonds	$28.6 million	27.7%	Portland, Oregon

Sources: http://visioncincinnati.files.wordpress.com/2010/03/streetcar-data-in-other-cities1.pdf
http://www.dot.gov/tiger/docs/fy2011_tiger.pdf

4.6 Conclusions

The literature indicates that streetcar projects that connect underdeveloped or underutilized area with the larger region offer significant opportunities for redevelopment, property premiums, and increases in property tax revenue receipts. While these impacts generally are seen as positives for the communities, these impacts must be balanced with planning and policies that encourage reasonable development expectations in terms of densities and any FBC requirements, to prevent large dislocations of existing populations, and potential policies that would help attract desired redevelopment opportunities.

The literature review identified several policy changes that could encourage development along the Columbia Pike Transit Initiative corridor, including following the FBC and increasing density restrictions in Arlington. Similarly, residential development should be encouraged, as it is noted that residential areas can subsequently attract retail, entertainment, and services (Arlington County's Columbia Pike Neighborhoods Plan, 2011). As demonstrated in the literature, other systems that changed development policies to allow for higher densities generally have experienced growth. However, it is also important to note that these densities and FBC requirements must be reasonable and meet local and developer expectations in order to attract desired development goals. For example, Charlotte notably has an excess capacity of density due to developers' unwillingness to redevelop to the new standards. This is something to keep in mind, as not all developers will be willing or able to redevelop immediately or meet these requirements and still meet affordable housing goals.

The literature reviewed indicated that underdeveloped and vacant land increased in value much faster than other property types; however, it also indicated that streetcar investments alone cannot be expected to cause all of the corridor transformations. Residential and commercial properties tended to see slower value increases than older, run-down industrial properties, particularly those properties that were abandoned. As the Columbia Pike Transit Initiative corridor is heavily residential, the property premiums expected could be on the lower end of the spectrum throughout much of the corridor.

To help maximize the property premium that could be expected along the Columbia Pike Transit Initiative corridor, the literature also recommends adding additional public or private investments that make the corridor more walkable. One way to improve the (sub)urban form in the streetcar corridor is to encourage creating a more grid-like street pattern as the blocks redevelop and incorporating green space. Walkability is seen as a positive

neighborhood attribute and can contribute to better health, lower transportation costs, lower congestion, and higher property values (Cortright, Walking the Walk, 2009).

5. Projected Development Impacts

The Columbia Pike Transit Initiative corridor revitalization strategy for Arlington and Fairfax Counties is to implement a premium transit service in combination with form-based zoning to gradually transform the strip commercial development stock to new commercial nodes along the corridor, encouraging compact commercial development around the nodes to form village or town centers. This strategy is designed to make the Columbia Pike Transit Initiative corridor more walkable and the nearby commercial opportunities more accessible. One of the key findings of the emerging "local accessibility" research is that "accessibility is a function of both proximity and connectivity," (Gary Pivo and Jeffry Fisher, The Walkability Premium, 2010).

Transit's role in connecting residents to nearby and proximate retail and entertainment opportunities (fostering corridor interaction and accessibility) would be reinforced by the recognition that the average non-work trip length for person trips to and from the Corridor (within ¼ mile of the corridor) is just 6.2 miles. If only trips within the corridor are considered, the average trip length is about 1/2 mile. Thus, many of these very short auto-based trips are good candidates for walk and transit modes. Substituting walking- and transit-based trips for auto-based trips would yield a cost savings for residents who take these trips. Collectively, this would improve the livability of the Columbia Pike Corridor.

The potential economic development impacts from the improved mobility include:

- Property premiums for properties immediately adjacent to the alignment[12]
- Opportunity for an increase in the pace of corridor revitalization
- Opportunity for new development investment to the counties

5.1 Property Premiums

The literature on the impact of transit investment on property value is long and diverse. As described in the previous section on the literature, studies generally conclude that land values appreciate along routes with streetcar or other forms of rail transit. The range of outcomes—everywhere from 0 to 30 percent—however makes application of the literature to the Columbia Pike setting difficult. This wide range reflects that individual studies focus on different metrics—appreciation adjacent to transit, appreciation within ¼ mile of transit, appreciation within ½ mile of transit, for example. The studies were performed over different time periods at different intervals following transit line completion, and varied based on economic settings, local zoning and policies, and individual property types evaluated. Use of the literature beyond developing a broad framework for thinking about how transit affects property values becomes very complex. It is nearly impossible to find a system that is perfectly comparable to the proposed streetcar in Arlington and Fairfax Counties, and thus there is no "rule of thumb" property premium value. Each situation is unique.

As a consequence, the results of the online survey and the developer workshop are particularly valuable here. Four out of five respondents to the online survey believed that the streetcar would impact the property value of existing parcels adjacent to the proposed streetcar alignment. Across all respondents, 9 percent felt that the impact would be very high—25 percent or greater. Another 26 percent maintained that the range of impact would fall between 15 and 24 percent. The largest share felt that the impact would be more modest, ranging between 4 percent and 14 percent. In short, the literature survey results display the same wide range of potential impacts as the online survey.

The range of potential property value impacts was explored at length at the developer workshop in an effort to narrow the range. The dialogue with the participants—who were knowledgeable about Arlington County, Fairfax County, and the corridor in particular—identified a wide variety of site-specific characteristics that contribute to the uncertainty manifested in the wide range of outcomes. Given that both the majority of the literature, online survey respondents, and developers believed that property would appreciate, this study used a 4 percent premium, recognizing that it is in the low part of the projected range. This assumption is consistent with that applied in the AA/EA document. The risk in this assumption is mostly on the upside; that is, if the 4 percent assumption is wrong, it is likely to underestimate the potential outcome—that properties in the corridor appreciate to a greater degree. Accordingly, an upper bound of 10 percent is also estimated—slightly lower than findings from the literature but consistent with developers with local first-hand knowledge of the corridor. This range is consistent with the findings of the *DC Streetcar Land Use Study* as well. An additional insight from that study was that residential areas tend to be on the low end of the range; areas of office concentration tend to be at the upper end. Moreover, the analysis only considers those properties that are directly adjacent to the corridor; property impacts in adjacent parcels are not considered although they too might appreciate, albeit at more

[12] With the likelihood of a smaller but positive impact on properties more distant from the corridor than the adjacent properties but still within the envelope of the ¼ mile boundary.

modest percentages given the greater distance to the investment. Much of the literature finds that the property premium effect is experienced up to a quarter mile from the streetcar's actual route.

Applying the 4 percent premium to just those parcels that are adjacent to the proposed streetcar alignment yields a minimum $126.2 million increase in value, which translates into an additional $1.2 million in property tax revenue annually at 2011 rates[13]. The 30-year gain in tax revenue from this 4 percent premium is $36.5 million in 2011 dollars. The equivalent values at 10 percent are $315.6 million increase in value, which translates into an additional $3.0 million in property tax revenue annually, yielding roughly $91.2 million in property tax revenue over the 30-year horizon[14]. This is summarized in the table below, which also provides the discounted values of the tax revenue stream at 3 percent and 7 percent. Discounting restates a stream of revenues as a net present value, recognizing the opportunity cost of having to collect the revenues gradually over a long period of time.

5.2 Increase in the Development Pace

While there was general consensus among survey respondents and the developers who attended the workshop that the pace of development would quicken, the potential gains are small—offering a few years of additional tax revenues at most. Nearly all respondents agreed the number of years of acceleration would be more than one year but less than five, simply because of the lead time needed to start construction. Given the uncertainty concerning the degree of acceleration, several scenarios are estimated here; one where projected development that is directly attributable to the streetcar occurs 2 years faster than without the streetcar and one where projected development occurs 3.5 years faster. One additional scenario was evaluated—that is that the introduction of the streetcar accelerates ALL new development in the corridor (not just new development attributable to the streetcar) by 2.0 years and 3.5 years. The results of each of these acceleration scenarios (net of the baseline revenues collected) are reported in the table below in base year 2011 values, as well as discounted at 3 and 7 percent.

5.3 New Development in the Counties

Survey respondents and workshop participants were generally agreed that redevelopment activity would intensify with streetcar implementation. Over nine out of ten survey respondents indicated that that the streetcar would spur redevelopment of existing properties; the degree of expected redevelopment varied. Forty percent indicated that the focus would be on renovation of existing buildings; another 30 percent indicated that redevelopment would be more intense with new construction added to existing properties or building uses altered to higher-valued uses; roughly one quarter felt that the impact would be very significant with existing properties demolished entirely to create the opportunity for a larger scale building.

The developers provided locations along the corridor that they felt would experience the greatest positive impact due to the streetcar service. Locations listed included: all locations along the streetcar route; Pentagon City to Glebe Road; Skyline; Pentagon City; the intersection of Glebe Road and Columbia Pike; the intersection of George Mason and Columbia Pike; the intersection of Columbia Pike and Walter Reed; the corridor west of Courthouse Road, all areas east of Four Mile Run; Baileys Crossroads; areas adjacent to the streetcar stations; and Glebe Road to the Navy Annex. The majority (60 percent) of respondents seemed to think the areas east of Four Mile Run Drive and west of Courthouse Road will see the most positive development, and this is consistent with much of the node development according to the FBC, particularly the Town Center between South Wayne Street and South Walter Reed Drive.

Stepping beyond the question of new development in the corridor, there is the more fundamental question of whether any of the intensification of development in the corridor is a transfer from elsewhere in the counties or entirely new to the counties—a net gain in other words. On describing their site selection process, 62.5 percent of the online respondents report that they first scan the entire region for particular attributes such as transportation accessibility or per capita income thresholds. This approach supports the view that some of the development could be net new to the counties. The remainder (37.5 percent) chooses a city or county first, and then selects the submarket. This indicates that most developers choose a site by its specific characteristics and that premium transit like a streetcar could entice developers to build along the corridor. When asked directly whether they would redirect development from other places in the county to the corridor, 40 percent responded "yes" with the caveat that the redirection would be from places without Metrorail access—bus or highway served areas. However,

[13] Extending the radius beyond the adjacent parcels to those located within ¼ mile adds another $1.1 million annually in tax revenues. The estimate assumes that the premium impact diminishes with distance and applies just half or a 2% gain to the properties beyond those directly adjacent.

[14] Extending the radius beyond the adjacent parcels to those located within ¼ mile adds another $2.8 million annually in tax revenues. The estimate assumes that the premium impact diminishes with distance and applies just half or a 5% gain to the properties beyond those directly adjacent.

nearly 60 percent maintained that the development was not a redirection—that they were not more likely to build in the corridor instead of at another Arlington or Fairfax location. Thus, it is plausible that some of the new development attracted to the corridor is net new to the counties as well—a net expansion of the county's tax base.

Recognizing that many factors come into play in the development decision, and that the percentage of net new development cannot be estimated with precision, a 10 percent increase in development intensity is applied as the share that is net new to the corridor and counties[15]. Applying the 10 percent increase in development intensity to projected corridor development yields an additional $1,005.9 million in building stock over what is projected to take place in the corridor over time, translating into an additional $156.2 million in property tax revenue collections over a 30 year period at 2011 rates.

As noted in the section above, a key risk in attaining this net new development is the allowable density under Arlington County's FBC.

5.4 New Tax Revenues

Beyond the direct property tax revenues associated with new development, the additional commercial activity associated with the acceleration of building activity and the additional development in the corridor would generate additional tax steams in the form of retail sales, business and professional licenses, and other associated business taxes. The additional revenues associated with these other taxes represent revenues of about $82.8 million (2011) across a variety of tax types. Further details of projected economic development impacts can be seen in Table 5-1.

Table 5-1: Summary of Projected Property Impacts

Line	Type of Impact	Millions $2011	Discounted @3	Discounted @7
Property Premium				
1	Value Created by Property Appreciation @4% (properties directly adjacent to the alignment)	126.2		
2	Value Created by Property Appreciation @10% (directly adjacent to the alignment)	315.6		
3	Tax Revenue Generated @4% (total 30 yrs)	36.5	20.6	10.8
4	Tax Revenue Generated @10% (total 30 yrs)	91.2	51.4	26.9
10% Net New Development Over and Above Projected Baseline Growth				
5	Value of New Building Stock Added to the Corridor	1005.9		
6	Tax Revenue Generated by the New Stock Added to the Corridor (total 30 yrs)	156.2	90.3	47.9
Value of Accelerating Development in the Corridor (net over baseline)				
7	Tax Revenue Generated by Accelerating Projected Development Attributable to the Streetcar by 2 Years (total 30 yrs)	16.1	9.8	5.5
8	Tax Revenue Generated by Accelerating Projected Development Attributable to the Streetcar by 3.5 Years (total 30 yrs)	20.2	12.3	6.9
9	Tax Revenue Generated by Accelerating ALL Projected Development in the Corridor by 2 Years (total 30 yrs)	161.2	98.2	54.9
10	Tax Revenue Generated by Accelerating ALL Projected Development in the Corridor by 3.5 Years (total 30 yrs)	201.6	122.7	68.7
Business and Other Non-Property Taxes Associated with Expansion of Business Activity in the Corridor				
11	Associated with the Value Created by Property Appreciation @4% (total 30 yrs)	0.0	0.0	0.0
12	Associated with the Value Created by Property Appreciation @10% (total 30 yrs)	0.0	0.0	0.0
13	Associated with New Building Stock Added to the Corridor (10% above projected growth) (total 30 yrs)	82.8	47.9	25.4

[15] Net new development is defined as a 10 percent net incremental gain over the baseline growth anticipated for the corridor as projected by MWCOG forecasts for the corridor, Fairfax County's *Baileys Plan*, and Arlington County's *Neighborhoods Area Plan*. In the case of the *Neighborhood Areas Plan* projections, the 3/5 of the projected amount of new growth is anticipated to be constructed over the analysis period used for this study. The project team converted projections of square footage using assessor's records for comparable new buildings in the corridor. Where a good recent (last 18 months) example of the property type was not available, the team used an example from nearby Shirlington, a nearby area that is not served by rail.

Line	Type of Impact	Millions $2011	Discounted @3	Discounted @7
Total Increase in Value of Corridor Building Stock				
14	Value of Property Appreciation (@4%) plus Value of New Building Stock Added to the Corridor (1+5)	1132.1		
15	Value of Property Appreciation (@10%) plus Value of New Building Stock Added to the Corridor (2+5)	1321.5		
Total Increase in Tax Revenues (Property and Associated Non-Property Taxes)				
16	Tax Revenue Associated with Property Premium (4%), New Stock Added to Corridor, Non-property Tax Revenues, and Acceration of Projected Development Attributable to Streetcar by 2 Years (3+6+7+13)	291.6	168.5	89.6
17	Tax Revenue Associated with Property Premium (4%), New Stock Added to Corridor, Non-property Tax Revenues and Acceleration of Projected Development Attributable to Streetcar by 3.5 Years (3+6+8+13)	295.7	171.0	91.0
18	Tax Revenue Associated with Property Premium (10%), New Stock Added to Corridor, Non-property Tax Revenues and Acceleration of All Projected Development in Corridor by 2 Years (4+6+9+13)	491.5	287.7	155.2
19	Tax Revenue Associated with Property Premium (10%), New Stock Added to Corridor, Non-property Tax Revenues and Acceleration of All Projected Development in Corridor by 3.5 Years (4+6+10+13)	531.8	312.3	168.9

Notes: Line 3: Extending the radius beyond the adjacent parcels to those located within ¼ mile adds another $34.6 million in tax revenues over the 30-year analysis period. The estimate assumes that the premium impact diminishes with distance and applies just half or a 2% gain to the properties beyond those directly adjacent.

Line 4: Extending the radius beyond the adjacent parcels to those located within ¼ mile adds another $86.5 million in tax revenues over the 30-year analysis period. The estimate assumes that the premium impact diminishes with distance and applies just half or a 5% gain to the properties beyond those directly adjacent.

6. Public Benefits and Future Considerations for Streetcar Implementation

Transit investments promote access, enhance mobility, expand modal choice and reduce congestion. These transportation outcomes also add value to locations that are well served by premium transit. Anticipated development and associated fiscal impacts are discussed in the previous section; this section focuses on public benefits of investment and risks to realization.

6.1 Value of Projected Mobility and Public Benefits

In addition to the property-related impacts, the streetcar's implementation would generate a variety of public impacts including the value of travel time savings, avoided injuries by transferring travelers to a safer mode from auto travel, a cleaner environment through reduced emissions and travel cost savings (net of transit fares) that make the cost of living in the corridor more affordable. All combined, these benefits total $252.9 million ($ 2011) and are summarized in Table 6-1[16].

The combined total of economic development (property premium) and the value of net new stock is $1,132.1 million assuming a 4 percent premium applied to parcels that are directly adjacent to the corridor. This value rises to $1,321.5 million if a 10 percent premium is applied to adjacent properties[17]. In addition, the project yields multiple mobility and public benefits. As noted above, these total $252.9 million ($2011)[18].

Table 6-1. Summary of Projected Mobility and Public Benefits

		Millions $2011	Discounted @3	Discounted @7
Mobility and Public Benefits				
20	Value of Travel Cost Avoided by Diverting Auto Travelers to Transit (net of transit fare)	25.2	13.8	7.0
21	Value of Travel Time Saved	141.3	77.4	38.9
22	Value of Fatalities/Injuries Avoided	38.4	21.7	11.3
23	Value of Emissions Avoided (includes CO2)	15.1	8.9	6.5
24	Residual Value of System Investments Beyond the 30-year Horizon	32.8	13.3	9.5
25	Total Mobility and Other Non-Property Benefits (20 through 24)	252.9	135.0	73.3

6.2 Risks to Achieving the Streetcar's Full Potential

Based on interviews and information obtained from the developer workshop, concern over the allowable density in portions of the corridor is the single largest downside risk to realizing the economic development potential of the corridor. While the development community understood that implementation of the FBC along Columbia Pike could yield higher densities, the incremental addition was not sufficient for them to build to a scale that would allow them to realize the full potential created by the streetcar. The two ends of the corridor, in Baileys Crossroads and Pentagon City, are less constrained in terms of development density. If the counties move forward with the streetcar, it is recommended that both counties convene a joint summit (or otherwise engage) with developers to review constraints and opportunities. While it was clear from the workshop participants that density is a concern, it was equally apparent that the corridor is viewed positively as an important development opportunity. Having a summit or some type of dialogue about the corridor could identify 1) potential revisions to the FBC and 2) creative solutions such as transfer of development rights among parcels or between the corridor and other strategic corridors in the counties in order to provide developers with greater flexibility.

[16] The public benefit analysis uses data from the AA/EA on VMT and travel minutes avoided to estimate the value of the public benefits. These are monetized according to guidance from the US Department of Transportation. In addition, an estimate of the system's residual value is developed using FTA's guidance on the typical useful life of assets. The residual value is provided as some of the components of the streetcar investment have a useful life beyond the 30-year time horizon used in this analysis. The residual analysis estimates the value of the unused portion of the asset.

[17] The increase in the value of existing stock combined with the addition of new stock yields greater tax revenues to the counties that would be received in the absence of the streetcar's implementation. As the tax revenues are generated by the property values, they are reported here but not summed with the property premium and construction values to avoid double counting.

[18] Because of the interaction between mobility benefits and property values—economic development occurs in response to the mobility and public benefits and thus "capitalizes" these benefits—the public benefits are not summed directly with the projected economic development estimates.

A second major consideration is the question of affordable housing. Both Columbia Pike and Baileys Crossroads have continued to experience a loss of affordable housing units while also expecting an increase in the population that would need them. With the proposed streetcar project, the potential redevelopment is anticipated to increase land values and encourage developers to raise rents, which could intensify the loss of affordable housing stock in both counties. To date, maintaining the existing units and attracting new developments of affordable housing has been difficult because of limited funding and incentives for developers (Rodgers, Charting a Way Forward, 2011).

Redevelopment under current conditions is only possible when new construction replaces the existing units by three to one for low-rise developments (less than 6 stories) – assuming below ground parking is not required (Arlington County, Columbia Pike Neighborhoods Plan, 2011). This may change, however, with the streetcar's implementation if rents rise sufficiently to permit construction at a mid-rise scale that allows developers to dedicate a portion of new units to affordable housing. If the rise in rents is sufficient, it may permit building at a scale that permits developers to operate profitably with a portion of units reserved for affordable units.

There are several ways to make it easier and more appealing for developers to provide affordable housing, and ways to supply a variety of affordable housing types. Flexibility in helping private owners create or maintain their stock of affordable housing and providing incentives to property owners to maintain their affordable units are two options for the counties. Expediting the approval and permit process for affordable housing units makes providing them easier for developers and owners.

An increase in density regulations could lead to a greater variety of housing options, especially in residential zones if the complex maintains a specified percentage of affordable housing units. Developers are also enticed by a reduction in property taxes, particularly for affordable units; and lower financing rates. There are numerous challenges for preserving – and attracting- affordable housing along the corridor, but there is a solution to be had if both of the counties and developers have the flexibility to make compromises. Maintaining the corridor's character and historic affordability in concert with new developments will allow the Columbia Pike corridor to remain a key asset to the counties.

6.3 Policy Recommendations

As noted above in Chapter 5, a streetcar investment would add significant value to the Columbia Pike corridor, in terms of land and development value, revenues to the counties, and direct benefits to the public. In relation to these findings, two themes repeatedly arose during the study: the ability to develop at greater density than permitted by Arlington's current FBC, and concerns regarding affordable housing. Although raised independently, these two issues can be connected.

Density and Existing Zoning. Participants in the developer workshop voiced repeated concern that Arlington County's existing FBC would not provide sufficient density for them to build to a scale that would capture the full potential of the corridor. The developers recognized that the FBC permits greater density than under traditional zoning, but still felt that it was a constraint. The allowable density in the corridor was a greater concern than requirements to provide affordable housing. The desire for additional density was not uniform along the corridor, but was focused on particular opportunity sites. The impetus for greater density was both a reflection of market potential but also by commercial feasibility given affordable housing requirements, parking, building costs, and other costs of development. One of the points of greatest consensus in the developer workshop was the recommendation that the counties consider updating the FBC.

Affordable Housing. The second concern regarding streetcar implementation was the potential loss of affordable housing. Although Arlington County's *Neighborhoods Area Plan* finds that the corridor is already losing its stock of affordable housing, the projected increase in property values associated with the streetcar investment will add pressure to rents (even as it supports owners). The issue is more complicated, however, than a simple property appreciation issue. On the one hand, streetcar investment will likely increase property values and pressures on affordability. On the other, providing high quality multi-modal transit with its easy access to jobs and services in a corridor with a large stock of affordable units such as Columbia Pike corridor represents best planning practices for coordinating land use and transportation, a foundation for a successful, sustainable community. Living in a walkable neighborhood with a good mix of uses and good access to public transportation can provide a 16 percent savings over living in an auto-oriented environment, according to a report by the Center for Transit-Oriented Development entitled "Realizing the Potential: Expanding Housing Opportunities Near Transit.[19]"

The key is in developing policies that balance the recapitalization of the corridor and attendant price pressures with the desire and need to preserve affordability—a mitigation strategy. As noted above, there are threshold

[19] As reported in TOD 201: Mixed-Income Housing Near Transit: Increasing Affordability With Location Efficiency. The Center for Transit-Oriented Development

effects in developing and preserving affordable housing. Arlington's *Neighborhoods Area Plan* concludes that high-rise and mid-rise residential developments (greater than 6 stories) are not feasible under current and generally anticipated market conditions but that this could change in the future as rents increase. The study also found that redevelopment under current conditions was only possible when the new construction replaced the existing units by three to one for low-rise developments (less than 6 stories) – assuming below ground parking is not required.

If the streetcar investment leads to rent increases sufficient to permit construction at a mid-rise scale, this could create an opportunity for designating a portion of the stock to be maintained at an affordable rate. Depending on the magnitude of the rent increase, subsidy may not be required. Second, the increase in value offers an asset that the counties can capture to support the affordable housing policy goal. Known as value capture—such an approach recognizes that nearby property owners will benefit from the construction of a new transit system through increased rents, sales, and land values. Some portion of these benefits is utilized to pay for the cost of the improvement OR for other designated uses such as community services and affordable housing. Value capture mechanisms are varied and can be tailored to local circumstances.

Suggested ways for Baileys Crossroads to maintain its affordable housing stock include incorporating a provision for rental units within one mile of the plan's boundaries to constitute a percentage of affordable housing, quantifying goals for subsidized and non-subsidized affordable housing, setting more aggressive targets to meet existing needs, establishing a plan and developing tools to achieve the new goals, and considering utilizing the same tools as Alexandria and Arlington to create continuity and provide incentives to common developers.

The preservation and provision of affordable and workforce housing units in the Baileys Crossroads area is guided by Countywide policy as well as specific recommendations in the *Comprehensive Plan* adopted for the area in 2010. The County's Workforce Housing Policy states that workforce housing should be provided in those areas of the County where the *Comprehensive Plan*s envision mixed use or high-density residential development above the baseline recommendations. Proposals for development that are above the baseline recommendation(s) in the *Plan* should include a minimum of 12 percent of all residential units in all building construction types as affordable housing (Affordable Dwelling Units and/or Workforce Housing). The Baileys Crossroad area, as a mixed-use center, is subject to this policy recommendation. As a result, any residential development at higher intensities would be expected to incorporate workforce housing units.

Further, the *Plan* for Baileys provides specific recommendations regarding the preservation of existing affordable housing units in the area. One of the guiding principles of the *Plan* is "Encourage the development of a range of residential unit sizes and types in order to encourage affordable housing throughout the Baileys Crossroads CBC (Community Business Center); retain the population diversity currently existing in the area; and create a lively, town center environment with viable live/work options."

Detailed recommendations are also provided in different parts of Baileys, divided into geographic areas called subunits. The language for Subunit A-2 specifically states that with redevelopment, 65 out of 400 residential units should be affordable. In Subunit B-5, a minimum of 90 units out of the 520 units should be affordable. Also, any existing affordable units should be preserved. With the potential of new and enhanced transit service along Columbia Pike, it is expected that interest in redevelopment will be spurred, leading to the creation of new affordable housing.

Finally, the Fairfax County Zoning Ordinance establishes an Affordable Dwelling Unit Program (Part 8 2-801) which requires the provision of housing for low and moderate incomes. The program is applicable at certain densities and with threshold unit counts. The program is intended to promote a range of housing choices, and requires the integration of affordable units within the developments to the extent feasible. Rent and/or sales price is controlled pursuant to the program. Given the expected redevelopment in the Baileys Crossroads area, many new higher density residential projects will likely be eligible for the program.

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7. References

Arlington County. 2005. "Columbia Pike Initiative: A Revitalization Plan—Update," pages 5-7.

Arlington County, Accessed Sept. 2011. The Vision- Arlington's Main Street. http://www.arlingtonva.us/Departments/CPHD/forums/columbia/concept/CPHDForumsColumbiaConceptTheConcept.aspx

BAE Urban Economics, *Charlotte Streetcar Economic Development Study*, City of Charlotte, April 2009.

BAE Urban Economics, TCRP Synthesis 86: Relationships between Streetcars and the Built Environment, TCRP, 2010.

Center for Transit-Oriented Development, *TOD 201 Mixed-Income Housing Near Transit: Increasing Affordability with Location Efficiency,* Federal Transit Administration, 2009.

City of Portland Bureau of Planning and Sustainability, Status Report: Twenty-minute Neighborhoods, May 2009.

"Columbia Pike Form Based Code (Section 20. Appendix A of the Zoning Ordinance). CPHD

Cortright, Joe, *Walking the Walk: How Walkability Raises Home Values in U.S. Cities*, CEOs for Cities, August 2009.

Courant, Paul N. "How would you know a good economic development policy if you tripped over one? Hint: don't just count jobs." National Tax Journal. 47.December (1994): 863-81. Print.

Dover, Kohl, & Partners, et al, *Columbia Pike Land Use & Housing Study*, Arlington County, May 2011.

Dover, Kohl, & Partners, et al, *Columbia Pike Neighborhoods Plan: Final Report*, Arlington County, April 6, 2012.

Dover, Kohl, & Partners, et al, *Columbia Pike Neighborhoods Area Plan: Policy Framework*, Arlington County, October 14, 2011.

E.D. Hovee & Company, LLC, *Streetcar-Development Linkage: The Portland Streetcar Loop*, City of Portland Office of Transportation, February 2008.

Fairfax County Comprehensive Plan, 2011 Edition for the Baileys Planning District, Amended through 07-27-2010.

Gary Pivo and Jeffry Fisher. 2010. "The Walkability Premium in Commercial Real Estate investments," forthcoming in Real Estate Economics.

Goody Clancy et al, *District of Columbia Streetcar Land Use Study, Phase 1*, District of Columbia Office of Planning, January 2012.

HDR, *Cincinnati Streetcar Feasibility Study: Risk Analysis-Investment and Finance Economics and Policy Final Report*, "Chapter 5: Economic Development Benefits, City of Cincinnati," November 15, 2007.

HDR, *Cincinnati Streetcar Project TIGER III Economic Analysis Supplementary Documentation*, City of Cincinnati, October 31, 2011.

Office of Transportation and Portland Streetcar, Inc., *Portland Streetcar Development Oriented Transit*, April 2008.

RK&K Engineers, *Baileys Crossroads Planning Study*, Fairfax County, January 2010.

Robert Puentes and David Warren. February 2006. "One Fifth of America: A Comprehensive Guide to America's First Suburbs: Data Report" Brookings Institution.

Rodgers, Angie, *Charting a Way Forward, Preserving Market Rate Affordable Housing in Northern Virginia's Inner Suburbs*, Northern Virginia Affordable Housing Alliance, 2011.

The Brookings Institution et al, *Value Capture and Tax-Increment Financing Options for Streetcar Construction*, DC Surface Transit, June 2009.

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Appendix A.
Developer Survey

Appendix A.
Developer Survey

The developer study is a central piece of the ROI Study data collection effort. The components of the survey included: a survey letter distributed to local and regional developers; the survey operated through surveymonkey.com; and the results exported to Microsoft Excel through surveymonkey.com.

A.1 Survey Letter

The letter below was sent by email to 53 developers on behalf of the Arlington County and Fairfax County client group. The contact information for each developer was obtained either through County information, CPRO, or their company websites. The letter included information on the study background, the contents of the survey, and the link where the representative could find the online survey. Anyone from the developer's firm was able to complete the survey on the firm's behalf.

March 7, 2012

Firm Name
Firm Address
Developer Name

VIA EMAIL: developer@developeremail.com

Dear Developer:

Arlington County and Fairfax County are conducting a Return on Investment Study for the Columbia Pike Transit Initiative to help understand if and how land values and uses along the Columbia Pike Corridor, Pentagon City, and Baileys Crossroads areas would change with the implementation of the Streetcar alternative. Understanding this effect is critical in evaluating whether to make the investment, and in articulating the potential benefits to federal, state, and local stakeholders and the general public.

In addition, the study will examine whether new policies or regulatory changes should be made in concert with the physical infrastructure investment to remove impediments to private investment and to ensure that Arlington County and Fairfax County receive the maximum economic development return on their streetcar investment.

The study includes an online survey of key individuals involved with land development in Arlington County and Fairfax County to help assess the corridor's market potential. We are contacting you to request that you or someone in your organization please complete the survey, which consists of mostly multiple choice questions with the option to provide written comments. The results of the survey will be discussed in an upcoming workshop and summarized in a study report, with the individual responses kept anonymous.

The online survey contains two sections:

- **Firm specific questions.** This section asks questions about your firm, the type of development you specialize in, where your projects are located, and whether you have developed or have plans to develop along the Study Corridor.
- **General Columbia Pike Corridor questions.** The questions in this section discuss how you think the streetcar project would impact development along the Study Corridor, market advantages offered by streetcar, and potential incentives that could help further influence development along the corridor.

PIKE TRANSIT INITIATIVE

To access the survey, please copy and paste the following link into your internet browser:
https://www.surveymonkey.com/s/2GRGB57

For timely completion of our study, we ask that you please complete the survey by ***March 14***.

If you have any questions about the study or the survey, please contact Sara Carini of AECOM at sara.carini@aecom.com or Carey Barr of AECOM at carey.barr@aecom.com.

Thank you in advance for your time and assistance.

Sincerely,

Steve Del Giudice
Transit Bureau Chief
Arlington County Department of
Environmental Services
Transportation Division

Leonard Wolfenstein
Chief
Transportation Planning Section
Fairfax County Department of Transportation

A.2 Survey Form

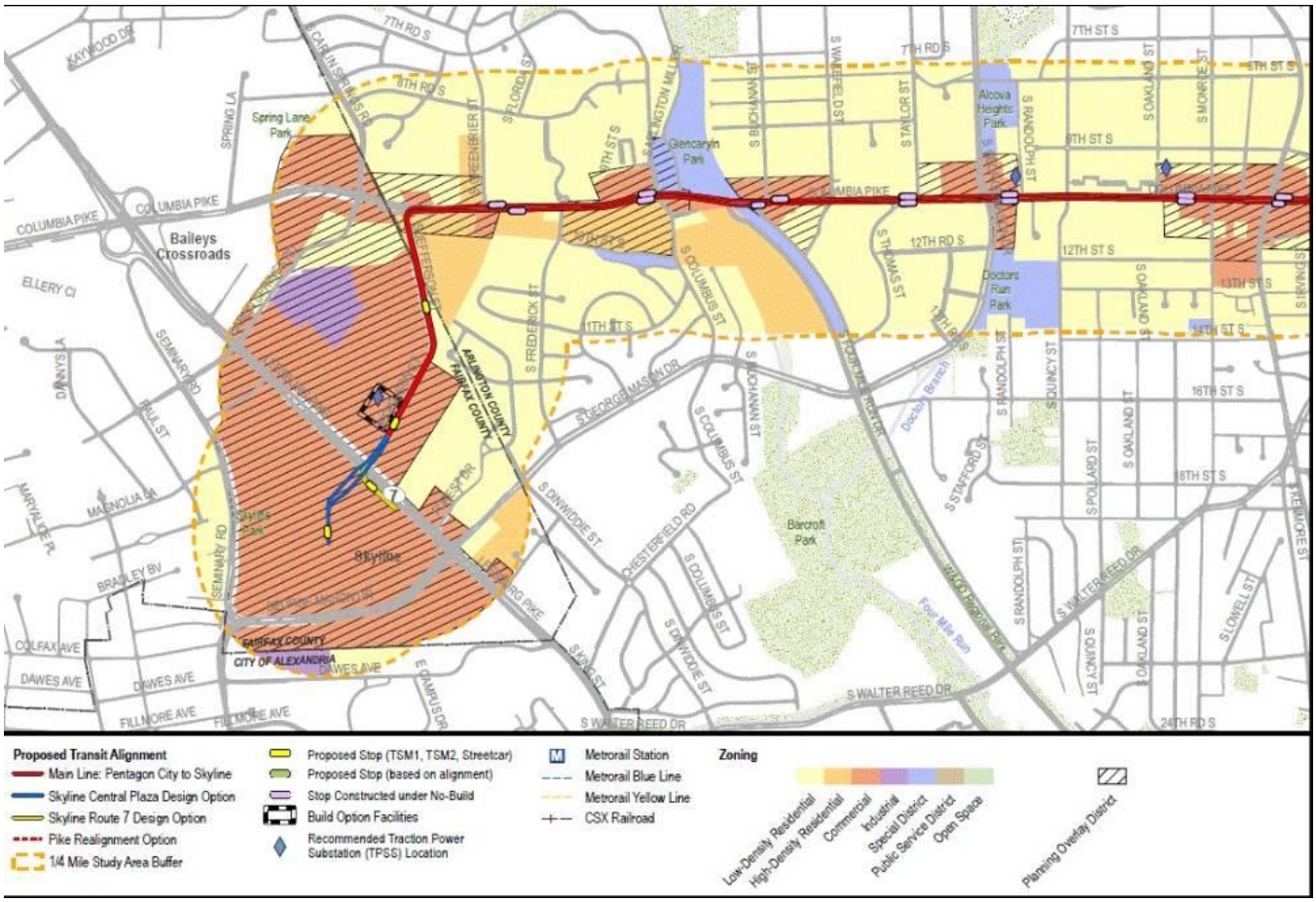
The survey was created within surveymonkey.com, an online survey host site. With an upgraded subscription, question logic was added to ensure that each developer was only asked to respond to questions that were applicable to their individual experiences and plans. The survey was distributed to the first batch of respondents on March 6, 2012 and to the rest the next day. The respondents were asked to complete the survey in one week. After the deadline lapsed, each respondent was contacted by phone and email to request that they please complete the survey. At that time, many asked for the link to the survey to be re-sent or forwarded to another party in the firm who would then complete it. This resulted in a 41percent response rate, or 22 completed surveys of the 53 requested. An additional 4 surveys were started but not completed.

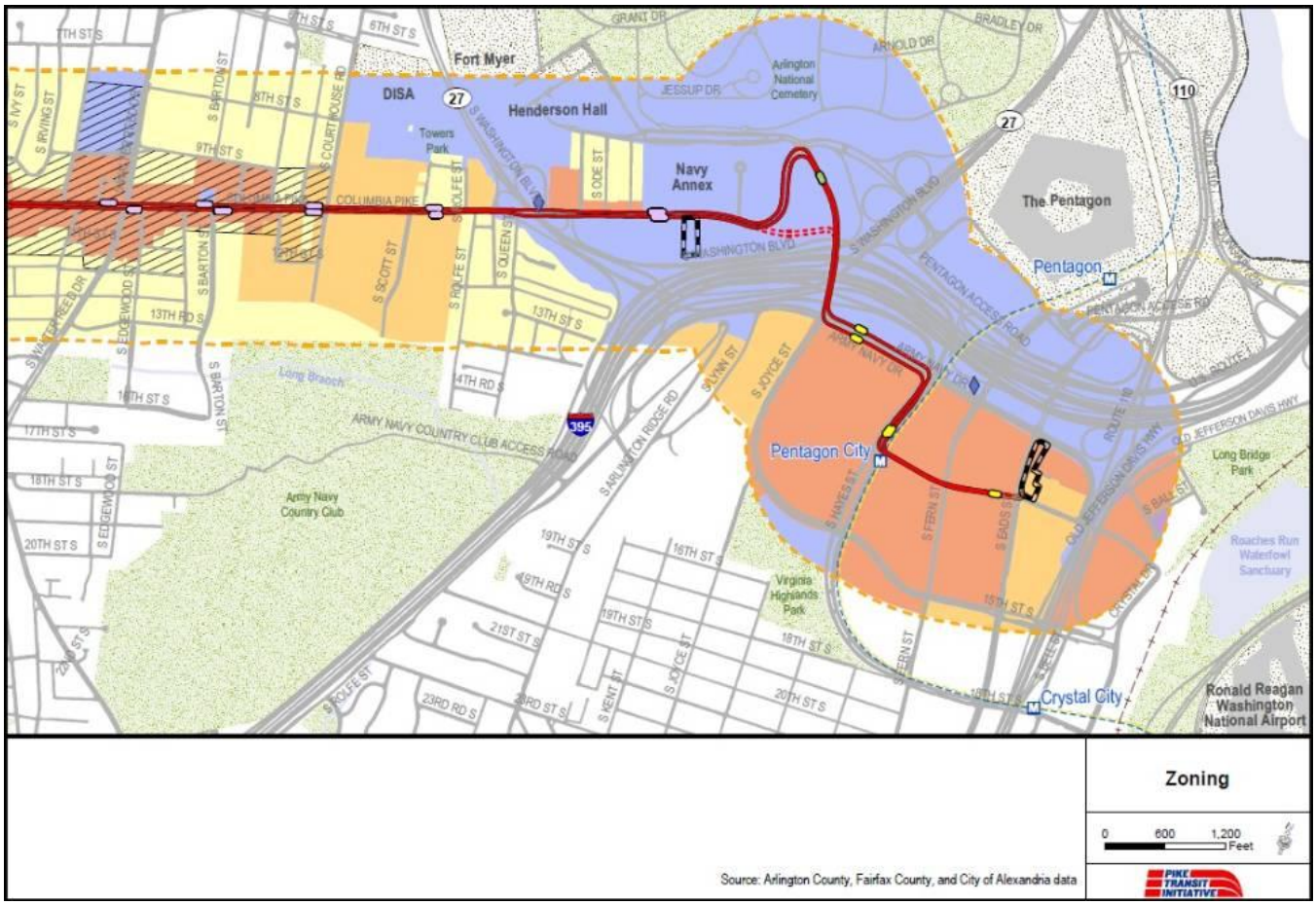
A.2.1 Survey Questions

The Columbia Pike Transit Initiative proposes a 5-mile in-street streetcar line along Columbia Pike between Skyline (western terminus) and Pentagon City (eastern terminus). Stations will be located every ¼ to ½ mile and will include enhanced shelters and boarding areas with real-time travel information. Vehicles will be SmarTrip compatible, and frequencies are to be every six minutes.

As part of the Columbia Pike Transit Initiative, Arlington and Fairfax Counties are undertaking a Return on Investment (ROI) study to better understand if and whether land values and uses might change (density, timing, scale, type, or quality of construction) with the implementation of the streetcar project. This survey is a core part of the investigation.

The proposed alignment can be seen in Figures 1 and 2 below.





1. What type(s) of development does your firm do? Please provide an estimated percentage of annual business associated with the categories below. [Please fill in all that apply.]

Retail

Office

Mixed-use

Industrial

Single family housing

Townhouse

Condominium

Market-rate rental housing

Affordable/low income housing

Senior housing

2. Have you previously built or invested along the Streetcar Corridor ?

- Yes
- No

3. Where?

- [ ] Pentagon City
- [ ] Columbia Pike
- [ ] Baileys Crossroads/Skyline

4. What type of development?

- [ ] Residential
- [ ] Retail
- [ ] Office
- [ ] Mixed-Use
- [ ] Other (please specify)

5. Would you develop along the Streetcar Corridor again?

- ○ Yes
- ○ No
- ○ Only if (please state condition in comment box) occurred

6. Do you have projects that are currently in progress or that you hope to undertake in the next year in Arlington or Fairfax Counties?

- ○ No
- ○ Yes, outside the Streetcar Corridor but elsewhere in the counties
- ○ Yes, in the Streetcar Corridor

You answered: "Yes, outside the Streetcar Corridor but elsewhere in the counties."

7. Please indicate where:

- [ ] Arlington - Jefferson Davis Metro Corridor
- [ ] Arlington - Orange Line Metro Corridor
- [ ] Arlington - Shirlington
- [ ] Arlington - Other Non-Metro Corridor
- [ ] Fairfax - Tyson's Corner
- [ ] Fairfax - Dulles Corridor
- [ ] Fairfax - Fair Lakes/Fair Oaks
- [ ] Other (please specify)

You answered: "Yes, in the Streetcar Corridor." For each project, please indicate:

8. Location

- Pentagon City
- Columbia Pike
- Baileys Crossroads/Skyline

9. Type and size [Please select all that apply.]

Residential (SF or units)

Retail (SF)

Office (SF)

Mixed-use (SF)

Other (SF)

10. Do you have another project to add?

- Yes
- No

11. Location

- Pentagon City
- Columbia Pike
- Baileys Crossroads/Skyline

12. Type and size [Please select all that apply.]

Residential (SF or units)

Retail (SF)

Office (SF)

Mixed-use (SF)

Other (SF)

13. Do you have another project to add?

- Yes
- No

14. Location

- Pentagon City
- Columbia Pike
- Baileys Crossroads/Skyline

15. Type and size [Please select all that apply.]

Residential (SF or units)

Retail (SF)

Office (SF)

Mixed-use (SF)

Other (SF)

16. Do you have another project to add?

- Yes
- No

17. Location

- Pentagon City
- Columbia Pike
- Baileys Crossroads/Skyline

18. Type and size [Please select all that apply.]

Residential (SF or units)

Retail (SF)

Office (SF)

Mixed-use (SF)

Other (SF)

19. Do you have another project to add?

- Yes
- No

20. Location

- Pentagon City
- Columbia Pike
- Baileys Crossroads/Skyline

21. Type and size [Please select all that apply.]

Residential (SF or units)

Retail (SF)

Office (SF)

Mixed-use (SF)

Other (SF)

You answered yes to having projects currently in process in the Streetcar Corridor. Please answer the following:

22. By what percentage (+ or -) would the development scale or size change with the implementation of the streetcar?

Retail (% change in SF)

Retail (% change in sales per SF)

Office (% change in SF)

Industrial (% change in SF)

Mixed-use (% change in SF)

Hotel (% change in SF)

Hotel (change in occupancy rate)

Restaurant (% change in SF)

Restaurant (% change in sales per SF)

Residential – condo (% change in SF)

Residential – rental (% change in SF)

23. What is your current timing for completion of this development?

24. Does the completion timing change with the implementation of the streetcar?

- Yes, would complete sooner
- Yes, would complete later
- No, would be the same
- Don't know

25. What most attracted you to the corridor? [Please select one from the following.]

- Streetcar project
- Location
- Streetscaping and redevelopment plan by the counties
- Other (please specify)

26. Will you need to pursue rezoning along the corridor?

- Yes
- No
- Don't know

27. If the streetcar is built, are you more or less likely to pursue rezoning in the corridor?

- More likely
- Less likely
- Neither more or less likely

28. Are you more likely to combine parcels to have a larger development with the implementation of the streetcar project?

- Yes
- No

Whether or not you have immediate plans to develop in the Streetcar Corridor, please answer the following questions:

29. How important is the current access to bus transportation to your plans? [Please select one from the following.]

- Very important
- Important
- Somewhat important
- Not important

30. How important is the potential access to higher quality transit in your plans, e.g. streetcars? [Please select one from the following.]

- Very important
- Important
- Somewhat important
- Not important

31. If you knew that streetcar service was a certainty with a well-established timetable, would this increase your interest in developing in the Streetcar Corridor? [Please select one from the following.]

- Very likely
- Somewhat likely
- Somewhat unlikely
- Not at all

32. If the streetcar were a certainty, which are the likely responses for projects along the corridor? [Please select all that apply.]

- [ ] Accelerate the project development timetable
- [ ] Change the scale of development
- [ ] Alter the mix of development (e.g. share of retail vs. residential)
- [ ] Other (please specify)

33. If the streetcar were a certainty, does this change your response to the question about whether you have plans for development in the Streetcar Corridor ?

- Response remains the same
- Yes (have plans to develop in next year) to No (would no longer have plans to develop in next year)
- No (do not have plans to develop in next year) to Yes (would have plans to develop in next year)

34. Why?

35. In which sub-market would the development likely be located? [Please select all that apply.]

- ☐ Pentagon City
- ☐ Columbia Pike
- ☐ Baileys Crossroads/Skyline

36. What type and general size (SF or units) of development would you consider? [Please select all that apply.]

Retail (SF)

Office (SF)

Industrial (SF)

Mixed-use (SF)

Hotel (Units or Rooms)

Restaurant (SF)

Residential – condo (Units)

Residential – rental (Units)

37. If the streetcar were a certainty, would you redirect development from other places in Arlington or Fairfax to the Streetcar Corridor? [Please select one from the following.]

- ○ Yes, the streetcar would make me more likely to develop along the corridor than places in Arlington and Fairfax with Metrorail.
- ○ Yes, the streetcar would make me more likely to develop along the corridor than places in Arlington and Fairfax without Metrorail.
- ○ No, the streetcar does not change likelihood of me developing along the corridor.
- ○ No, the streetcar would make me less likely to develop along the corridor than elsewhere in Arlington and Fairfax.

38. Which of the following best describes your location selection process for development? [Please select one from the following.]

- ○ Choose a city/county first, and then a submarket
- ○ Scan the entire region for particular attributes such as transportation accessibility or per capita income thresholds, for example.

39. At what point does transportation access enter into your site selection decision (if at all)?

40. How certain are you that the streetcar project will be built?

- ○ Sure it will happen
- ○ Probably will happen
- ○ Neither sure nor unsure
- ○ Probably will not happen
- ○ Sure it will not happen

General Streetcar Questions

This section asks your opinion on various potential impacts to the general Streetcar Corridor, regardless of whether you have developed or plan to develop along the corridor.

How does the streetcar's availability impact the property value of existing parcels along the Streetcar Corridor?

41. Adjacent to the alignment? [Please select one from the following.]

- Very significant (values 25% higher)
- Significant (values 15-24% higher)
- Somewhat significant (values 4-14% higher)
- Insignificant (little or no effect on the value)

42. Within ¼ mile but not adjacent? [Please select one from the following.]

- Very significant (values 25% higher)
- Significant (values 15-24% higher)
- Somewhat significant (values 4-14% higher)
- Insignificant (little or no effect on the value)

43. Within ½ mile but not adjacent? [Please select one from the following.]

- Very significant (values 25% higher)
- Significant (values 15-24% higher)
- Somewhat significant (values 4-14% higher)
- Insignificant (little or no effect on the value)

44. Averaging across all locations, how significant would the building of the streetcar be in spurring the redevelopment of existing properties to a higher value use along the Streetcar Corridor? [Please select one from the following.]

- Very significant (willing to completely demolish existing structures and rebuild)
- Significant (willing to construct new square footage either on existing structures or on empty properties, or willing to alter building uses)
- Somewhat significant (willing to renovate existing buildings)
- Insignificant (little or no effect on the space developers will redevelop)

What type of redevelopment would you expect to occur?

45. Averaging across all locations, how significant would improved access from the streetcar be in spurring new residential development along the Streetcar Corridor?

- Very significant (build 25%+ additional units per project)
- Significant (build 15-24% additional units per project)
- Somewhat significant (build 4-14% additional units per project)
- Insignificant (little or no effect on the number of units developers will build)

46. What type/scale of new residential development would you expect to occur? [Please select all that apply.]

- ☐ Condos (type)
- ☐ Apartments (type)
- ☐ Affordable housing (type)
- ☐ Retirement housing (type)
- ☐ Garden style (type)
- ☐ Mid-rise (scale)
- ☐ High-rise (scale)
- ☐ Townhome (scale)

47. Averaging across all locations, how significant would the building of the streetcar be in spurring new commercial development along the Streetcar Corridor? [Please select one from the following.]

- ○ Very significant (build 25%+ additional SF per project)
- ○ Significant (build 15-24% additional SF per project)
- ○ Somewhat significant (build 4-14% additional SF per project)
- ○ Insignificant (little or no effect on the SF developers will build)

48. What type/scale of new commercial development would you expect to occur? [Please select all that apply.]

- ☐ Retail (type)
- ☐ Office (type)
- ☐ Industrial (type)
- ☐ Mixed-use (type)
- ☐ Hotel (type)
- ☐ Restaurant (type)
- ☐ Lower level of residential/office building (scale)
- ☐ Mid-rise (scale)
- ☐ High-rise (scale)

49. Would the presence of the streetcar make retail sales volume per square foot increase along the corridor?

- ○ Yes
- ○ No

50. If yes, by how much?

- ○ Very significant (25%+ additional sales volume per SF)
- ○ Significant (15-24% additional sales volume per SF)
- ○ Somewhat significant (4-14% additional sales volume per SF)
- ○ Insignificant (little or no effect on the sales volume)

51. In your opinion, which areas along the Streetcar Corridor would experience the greatest positive impact from the streetcar service? [Please use intersections to help describe the locations.]

52. Would some areas along the Streetcar Corridor become less attractive for development if streetcar service is provided?

- Yes
- No

If yes, please specify which locations.

53. Would the presence of streetcar service make it easier to obtain financing for projects along the Streetcar Corridor?

- Yes
- No

In general, do you think the streetcar service would provide a market advantage along the Streetcar Corridor for the following:

54. Faster absorption of space? [Please select one from the following.]

- Very significant (25%+ faster absorption)
- Significant (15-24% faster absorption)
- Somewhat significant (4-14% faster absorption)
- Insignificant (little or no effect on absorption)

55. Positive impact on net rent level? [Please select one from the following.]

- Very significant (prices 25%+ higher per SF)
- Significant (prices 15-24% higher per SF)
- Somewhat significant (prices 4-14% higher per SF)
- Insignificant (little or no effect on price per SF)

56. Lead to larger transactions (i.e. leases of multiple floors to quality tenants)? [Please select one from the following.]

- Very significant (25%+ more likely)
- Significant (15-24% more likely)
- Somewhat significant (4-14% more likely)
- Insignificant (little or no effect on transaction size)

57. Reduce parking? [Please select one from the following.]

- Very significant (25%+ fewer spaces)
- Significant (15-24% fewer spaces)
- Somewhat significant (4-14% fewer spaces)
- Insignificant (little or no effect on number of spaces)

58. Would streetcar service by itself be a differentiator in the Arlington County and Fairfax County markets?

- Yes
- No

Why?

How important are other types of incentives that could be combined with streetcar service along the Streetcar Corridor?

59. Density bonus? [Please select one from the following.]

- Very important
- Important
- Somewhat important
- Unimportant

60. Up-zoning? [Please select one from the following.]

- Very important
- Important
- Somewhat important
- Unimportant

61. Low interest loans? [Please select one from the following.]

- Very important
- Important
- Somewhat important
- Unimportant

62. Expedited development review? [Please select one from the following.]

- Very important
- Important
- Somewhat important
- Unimportant

63. Assistance with land assembly? [Please select one from the following.]

- Very important
- Important
- Somewhat important
- Unimportant

64. Joint development programs? [Please select one from the following.]

- Very important
- Important
- Somewhat important
- Unimportant

65. Are there any other impediments to developing along the Streetcar Corridor that would override any attractiveness of the streetcar?

- Yes
- No

If yes, please explain.

66. In general, which has a greater impact on development decisions?

- Transit
- Incentives
- Other

Please explain your response. If Other is selected, please identify the factor.

Thank you.

67. May we follow up with you about any of your survey responses with a phone call or email?

- Yes
- No

68. Are you or someone from your firm willing to participate in a follow-up economic development workshop?

- Yes
- No

69. If you are willing to have us follow up with you, please provide the following contact information:

Name

Title

Organization

Phone

Number

Email Address

Thank you!

Thank you again for your assistance with the Columbia Pike Transit Initiative Return on Investment Study.

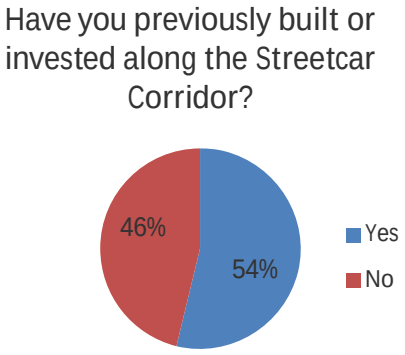
If you have any questions or additional comments on the survey, please do not hesitate to contact Sara Carini at sara.carini@aecom.com or Carey Barr at carey.barr@aecom.com.

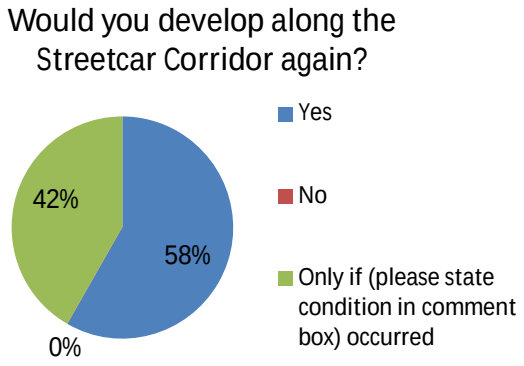
A.3 Summary of Survey Results

The survey distributed to the local and regional developers contained a total of 69 questions, though every respondent would not answer each question. Logic was built-in to direct the respondent according to how each question was answered. The survey was divided into four subtopics of questions: developer background information, transit access and the real estate market, property premium, and policies and incentives. A detailed analysis of the questions and responses is presented here.

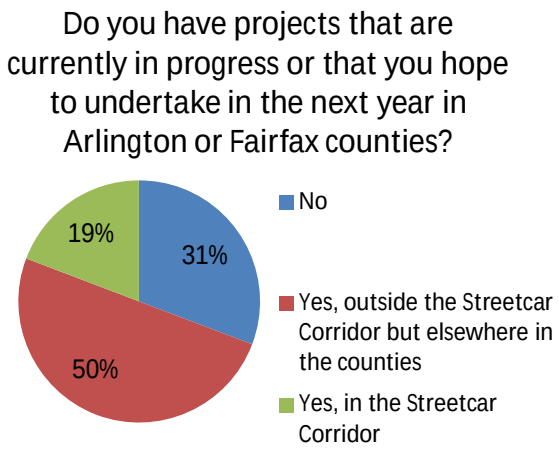
A.3.1 Developer Background Information

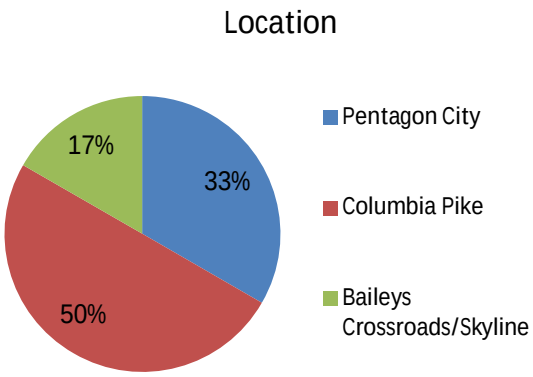
The first section of the survey asked questions about the developers in order to gain an understanding of their company, the types of developments they typically build, and whether they had previously built along the corridor or plan to in the future. Twenty five respondents answered the first question about the types of development their firm builds indicating a variety of uses: 52 percent answered retail, 36 percent office, 32 percent mixed use, 60 percent market rate apartments, 40 percent affordable/low income housing, 32 percent single-family housing, 32 percent condominiums, 20 percent senior housing, 12 percent industrial, 24 percent townhouse. The respondents were asked to indicate all of the uses that their firm builds. Just over half (53.8 percent) of the respondents had built along the corridor previously, with 53.8 percent of those having built along Columbia Pike, 15.4 percent in Pentagon City, and 38.5 percent in Baileys Crossroads or Skyline. The majority (61.5 percent) who had previously built along the corridor had built retail, followed by residential (46.2 percent) and office (30.8 percent) uses. Of those who have previously built along the corridor, 58.3 percent indicated that they would do so again, while 0 percent said they would not. The option of "only if" was provided with space for the reasoning, and three of the five who left feedback indicated that higher densities or zoning would need to increase in order for their firms to develop along the corridor again.





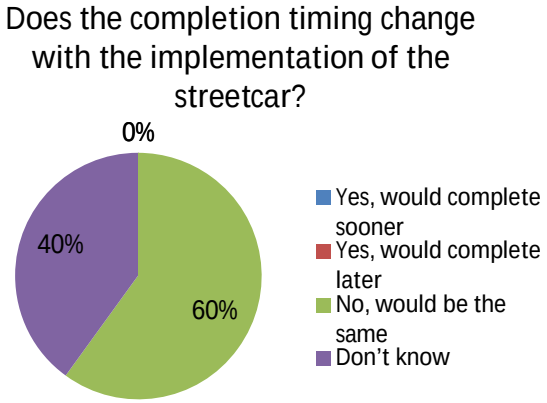
All of the survey-takers answered the question about whether they had projects currently underway or would plan to have projects underway in the next year, with 50 percent indicating that they do have projects currently underway in the counties, but outside of the corridor. Only 19.2 percent have projects underway in the corridor. The development occurring within the counties but not in the corridor was primarily in Arlington along the orange line Metrorail corridor between Rosslyn and Ballston stations (53.8 percent), though Tyson's Corner (30.8 percent) and the Dulles Corridor (38.5 percent) also had a significant portion of the development. Fewer developers are constructing in Shirlington (0 percent), non-metro corridors (7.7 percent), Fair Lakes/Fair Oaks (7.7 percent), and Seven Corners and Lorton (15.4 percent together). Of those who indicated that they are developing within the streetcar corridor, 50 percent of the development is along Columbia Pike, 33.3 percent is in Pentagon City, and the remaining 16.7 percent in Baileys Crossroads/Skyline. The corridor developers were asked to describe their development that is currently underway, and 80 percent of these developments are residential and 60 percent are retail. Two of the developments are residential above retail, while two are solely residential and the remaining one is retail only. Only two developers had more than one project in the area, but of those they projects are located in Pentagon City (50 percent) and Columbia Pike (50 percent). One project is a mixed use building with retail, office, and hotel space, while the other is all residential. Finally, one developer had a third project underway, located in Columbia Pike. It will be a residential development, with its size yet to be determined.

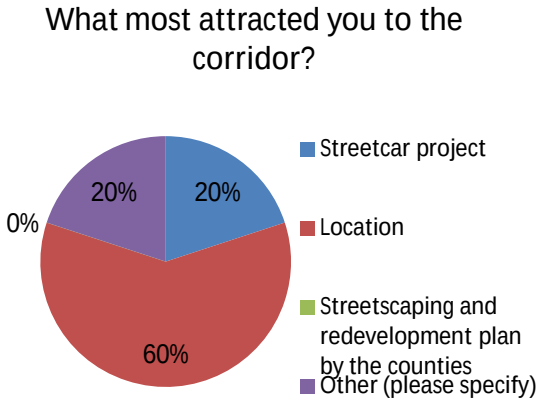




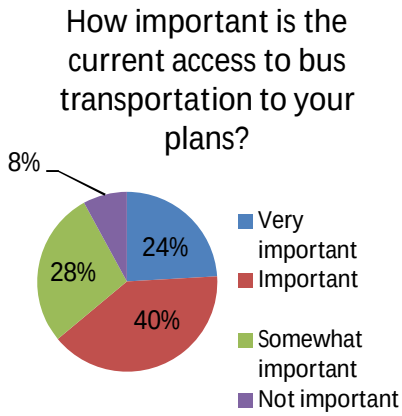
A.3.2 Transit Access and the Real Estate Market

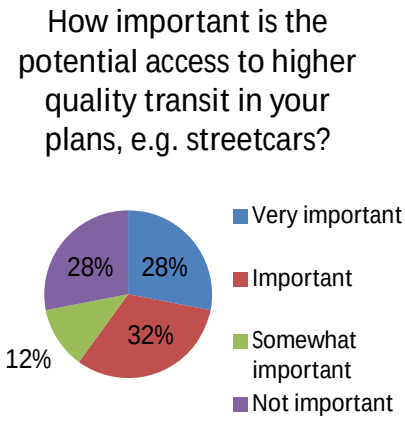
The following group of questions centered around transit accessibility and its perceived effects on the real estate market. For the limited respondents (5) who have developments currently underway in the corridor, one respondent believed that the size or size of retail developments would decrease by 100 percent with the implementation of streetcar. No other conclusive information was obtained on the size or scale change. Of the five currently in-process projects, four indicated their timing of completion, with two in 2014, one as soon as the County approves the plans, and the final developer has three projects. The first of the three, Buchanan Gardens, will be complete in the fall of 2012, Arlington Mill in December 2013, and a future project that is in the location selection process. When asked if the completion timing for the projects would change with the implementation of the streetcar, 60 percent indicated that it would be the same and the remaining 40 percent did not know how the streetcar would affect their timing. The majority of respondents (60 percent) chose the corridor due to its location, while one (20 percent) said the streetcar project and one (20 percent) said they were attracted by the opportunity to serve the affordable housing community. The majority (80 percent) will need to pursue rezoning along the corridor and the remainder is unsure. If the streetcar is built, 80 percent are neither more nor less likely to pursue the rezoning necessary, while 20 percent is more likely to pursue it. In a similar sentiment, only 20 percent is more likely to combine parcels if the streetcar is built, while 80 percent is not likely to. These responses indicate that the streetcar is not likely to impact the size, pace, or rezoning efforts of developers and their developments along Columbia Pike.

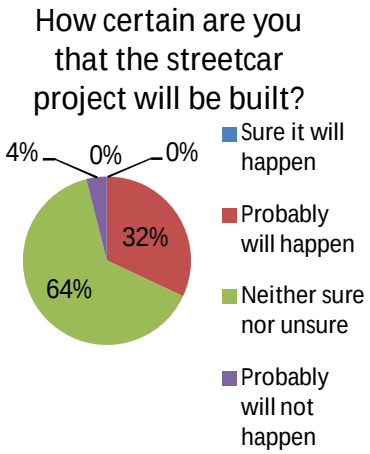




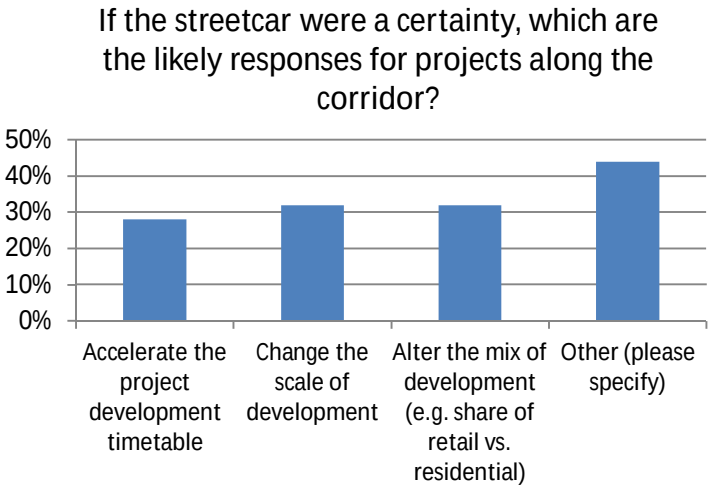
The current access to bus transit, which is notably excellent along the corridor with frequent service and the highest ridership in the state, is important or very important to 64 percent of respondents, somewhat important to 28 percent and not important to 8 percent. The potential access to higher quality transit such as streetcars was very important or important to 60 percent, somewhat important to 12 percent, and not important to 28 percent. More developers feel that the access to bus transit is important than those who feel access to higher quality transit is important. While one would expect higher quality transit access to be attractive to developers, this disparity is explained by the response to how certain the developers are about whether the streetcar will be built or not. The majority (64 percent) of respondents are neither sure nor unsure that the streetcar project will be built. None are sure it will happen or sure it will not happen, but 32 percent believe it probably will happen and 4 percent believe it probably will not happen. The reason for a lack of endorsement of higher quality transit is due to the developers' limited confidence in the actual fruition of the streetcar project.



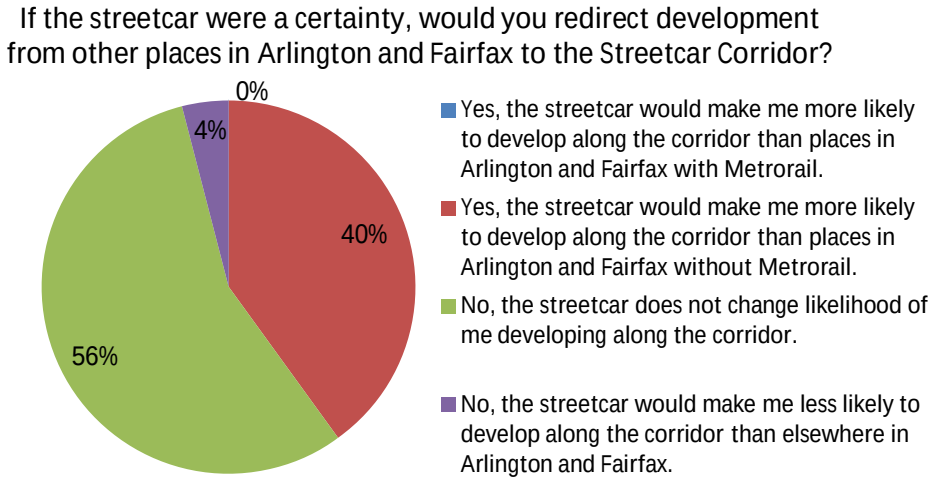




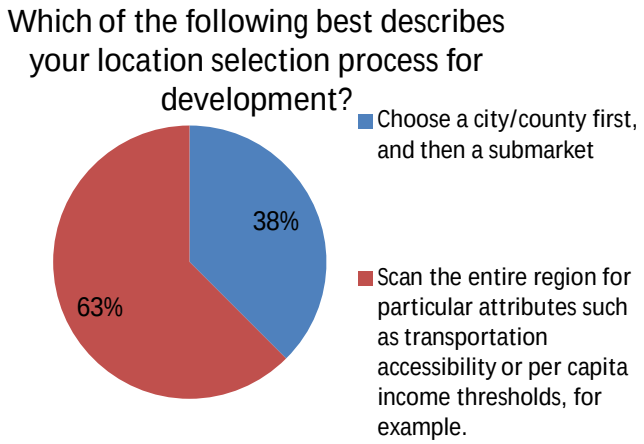
Even assuming the certainty of the streetcar's construction and operation, developers are hesitant to commit to new projects in the corridor. When asked if their interest in developing on the corridor increases if the streetcar project were guaranteed to be built, 33.3 percent said they would be very likely to develop, 29.2 percent would be somewhat likely, 16.7 percent somewhat unlikely, and 20.8 percent would not change their minds about developing in the corridor due to the streetcar. To further understand how developers might change their development decisions with the certainty of streetcar, the survey respondents indicated a nearly even split between accelerating the project timetable (28 percent), changing the scale of the development (32 percent), altering the mix (32 percent), and numerous other options (44 percent). Some of the suggested changes that the developers would expect included no changes to the existing project plan (36.4 percent), and others indicated that it would depend on density allowances, would increase the quality of development, and alter the type of development. The majority of developers said that their decision to develop along the corridor would remain the same even if the streetcar were a certainty, while 11.5 percent would no longer want to develop, and 15.4 percent would be enticed to develop along the corridor even though they currently have no plans to do so. A single reason was given for the switched response: transportation means renters. This indicates that developers value the ridership that can be expected on a higher quality transit corridor. All three respondents stated that the newly-enticed development due to the streetcar would be built along Columbia Pike (100 percent), while one also said in Baileys Crossroads/Skyline (33.3 percent). The type of development would be rental apartments, condominiums, and mixed-use.

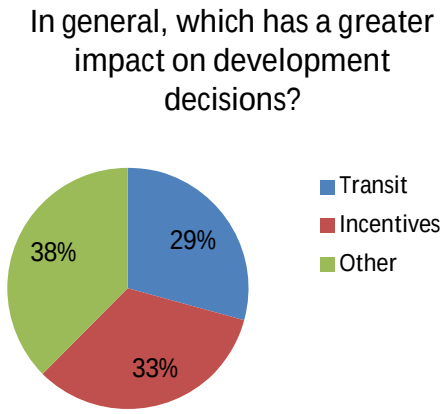


Understanding the amount of net new development as opposed to a transfer of developments within the counties is central to learning whether the streetcar itself is enough to redevelop along Columbia Pike. The majority of respondents indicated that the streetcar does not change the likelihood of developing along the corridor, though 40 percent would be more likely to develop along the corridor as opposed to other places in Arlington and Fairfax Counties without Metrorail access, and 4 percent felt that the streetcar would make them less likely to develop along the corridor than elsewhere in Arlington or Fairfax Counties. The fourth option, which had no responses, was for the corridor to experience more development than a Metrorail corridor. As expected, no developers were more attracted to the streetcar corridor than to Metrorail corridors, though they are more attracted to the streetcar corridor than areas without streetcar.



When selecting a site for development, 62.5 percent first scan the entire region for particular attributes such as transportation accessibility or per capita income thresholds. The remainders (37.5 percent) choose a city or county first, and then select the submarket. This indicates that most developers choose a site by its specific characteristics and that premium transit like a streetcar could entice developers to build along the corridor. Transportation accessibility enters the site-selection process early on for a number of developers (20 percent) and many (35 percent) indicated that transportation access is an important factor in the evaluation process. When asked whether transit, incentives, or another factor have a greater impact on development decisions, the responses were nearly equally split among the three, with transit (29.2 percent), incentives (33.3 percent), and other (37.5 percent). Some of the other responses included land prices, the certainty and speed of zoning approvals, market demand, local long-term employment growth, financial returns, stable credit markets, increased density, and location.

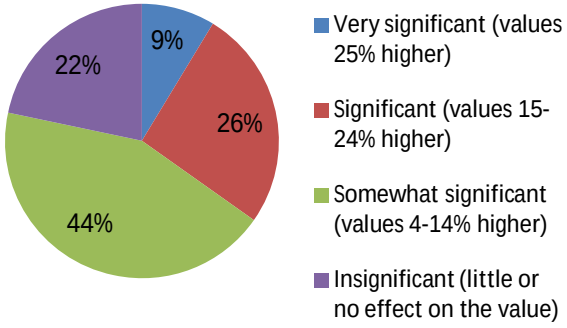




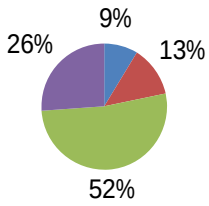
A.3.3 Property Premium

Developers were asked how the streetcar's availability would impact the property value of existing parcels along the Streetcar Corridor adjacent to the alignment, within a quarter mile of the corridor, and within half a mile of the corridor. The available answer choices included: very significant (values 25 percent higher), significant (15-24 percent higher), somewhat significant (4-14 percent higher), and insignificant (little or no effect on the value). The responses indicate a stronger correlation with shorter distances from the corridor. For example, the proportion of respondents believing that the three options have little or no effect on the value of properties increases from 21.7 percent to 26.1 percent, and finally 65.2 percent as the properties move from adjacent to within ¼- and then ½- mile. Overall, the responses methodically move from significant to insignificant as the distance from the corridor increases. As expected, the properties closest to the alignment can be expected to experience the highest increase in value, with a tapering off towards the half-mile buffer.

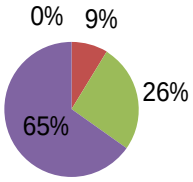
How would the streetcar's availablity impact the property value of existing parcels adjacent to the alignment?



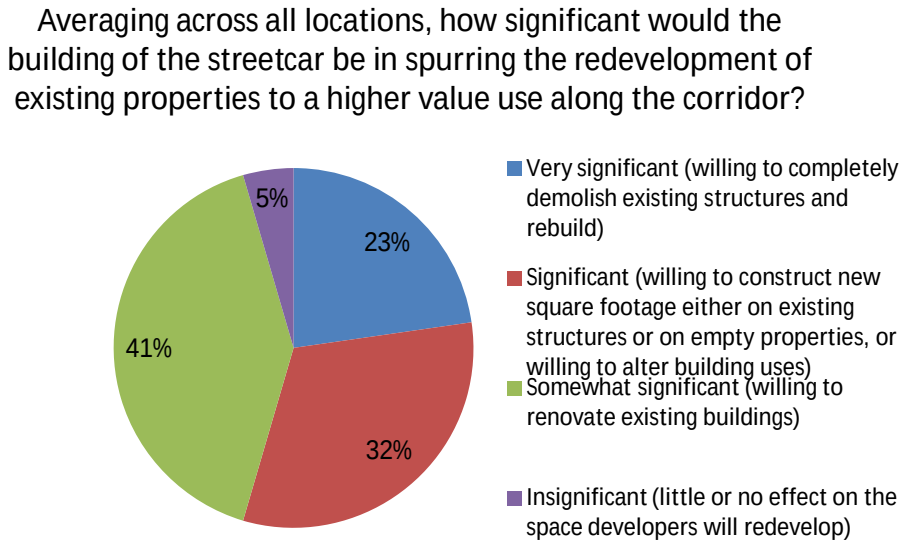
Within ¼ mile but not adjacent?



Within ½ mile but not adjacent?

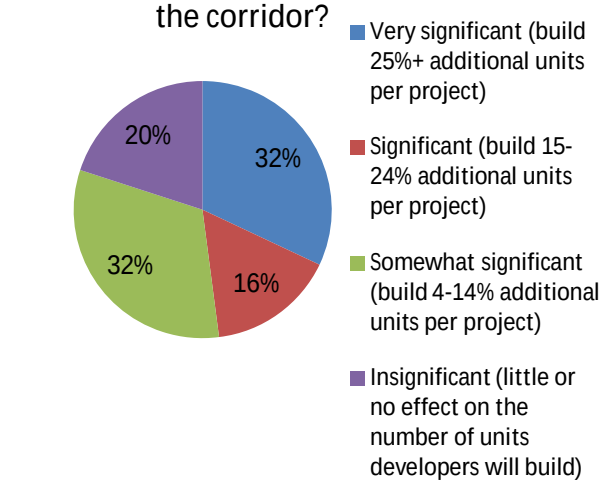


Another key in understanding the effect of streetcar on redevelopment values can be investigated through what developers believe will happen to existing properties. The response answers included: very significant (willing to completely demolish existing structures and rebuild); significant (willing to construct new square footage either on existing structures or on empty properties, or willing to alter building uses); somewhat significant (willing to renovate existing buildings); and finally insignificant (little or no effect on the space developers will redevelop). The responses indicate that developers feel that the effect on the redevelopment of existing properties will be somewhat significant (40.9 percent) followed by significant (31.8 percent) and very significant (22.7 percent), and finally insignificant (4.5 percent). Fourteen wrote in the types of redevelopment that they expect would occur, with the majority (57.1 percent) saying residential, followed by ground level retail (28.6 percent) and mixed-use (21.4 percent).

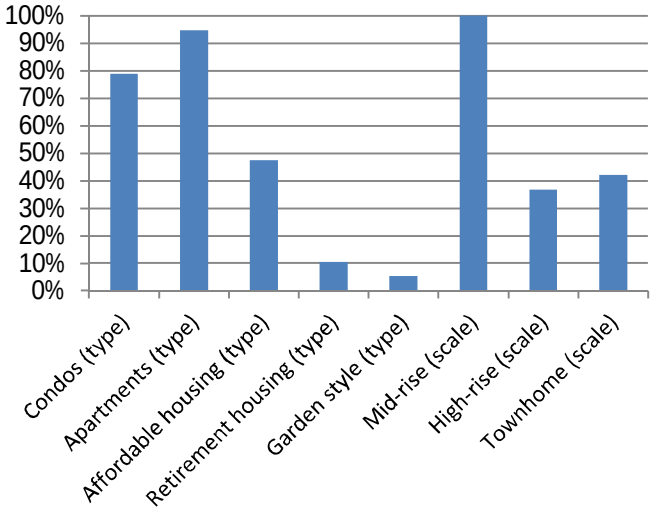


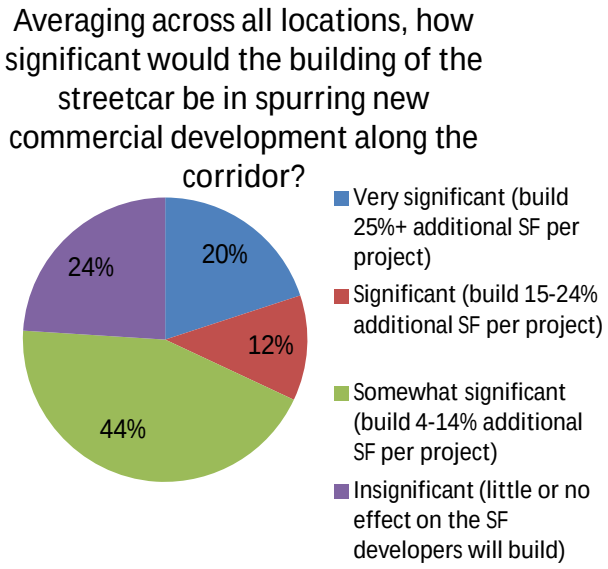
The effect on new residential and commercial developments along the corridor was asked in terms of additional units or square feet built per project with the same response thresholds as the previous questions. The streetcar was found to have a very significant (build 25 percent or more additional units per project) and somewhat significant effect (build 4-14 percent additional units per project) on the number of additional units built (32 percent each) of residential uses, while 20 percent believed it would have an insignificant (little or no effect on the number of units developers will build) effect and 16 percent a significant (15-24 percent additional units per project) effect. A variety of types of new residential units were expected, including mid-rise (100 percent), apartments (94.7 percent), condos (78.9 percent), and affordable housing (47.4 percent). Others with lower responses were retirement housing, garden style, high-rise, and townhomes. The streetcar is expected to have a somewhat significant (build 4-14% additional square feet per project) effect on new commercial developments (44%) followed by an insignificant effect (little or no effect on the square footage developers will build) (24%). The types of commercial development that developers expect include retail (84.2%), restaurants (84.2%), mixed-use (63.2%), and mid-rise commercial (57.9%). Other selections included offices, hotels, first floor retail spaces, and high-rise commercial developments. The majority of developers believe that the presence of the streetcar will increase the retail sales volume per square foot (70.8%). The sales volume is expected to increase by a somewhat significant amount (4-14% additional sales volume per square foot) by the majority of developers (52.4%).

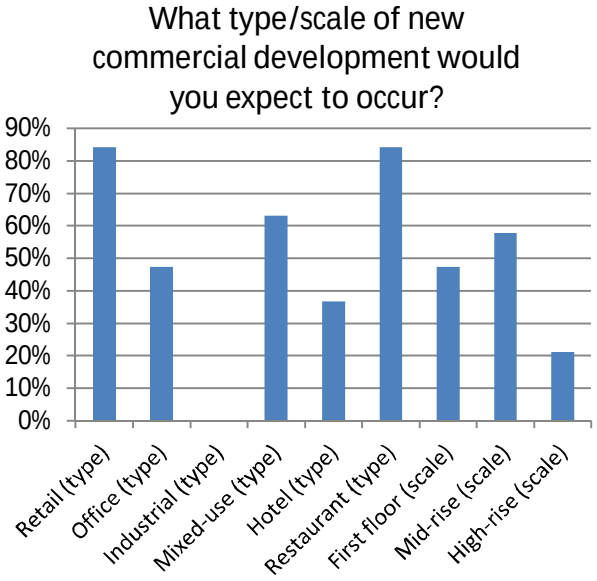
Averaging across all locations, how significant would improved access from the streetcar be in spurring new residential development along the corridor?



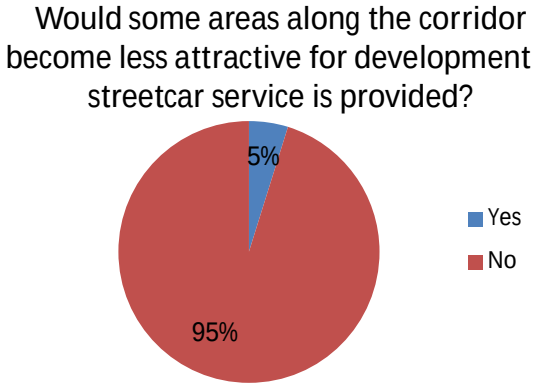
What type/scale of new residential development would you expect to occur?




Averaging across all locations, how significant would the building of the streetcar be in spurring new commercial development along the corridor?
20%
12%
44%
24%
Very significant (build 25%+ additional SF per project)
Significant (build 15-24% additional SF per project)
Somewhat significant (build 4-14% additional SF per project)
Insignificant (little or no effect on the SF developers will build)

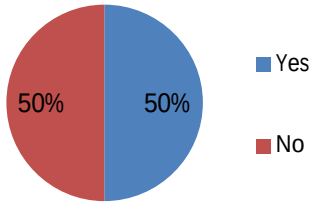

What type/scale of new commercial development would you expect to occur?
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Retail (type)
Office (type)
Industrial (type)
Mixed-use (type)
Hotel (type)
Restaurant (type)
First floor (scale)
Mid-rise (scale)
High-rise (scale)

The developers provided locations along the corridor that they felt would experience the greatest positive impact due to the streetcar service. Locations listed included: all locations along the streetcar route; Pentagon City to Glebe Road; Skyline; Pentagon City; the intersection of Glebe Road and Columbia Pike; the intersection of George Mason and Columbia Pike; the intersection of Columbia Pike and Walter Reed; the corridor west of Courthouse Road, all areas east of Four Mile Run; Baileys Crossroads; areas adjacent to the streetcar stations; and Glebe Road to the Navy Annex. The majority (60 percent) of respondents seemed to think the areas east of Four Mile Run Drive and west of Courthouse Road will see the most positive development, and this is consistent with much of the node development according to the FBC, particularly the Town Center between South Wayne Street and South Walter Reed Drive. Alternately, some areas along the corridor may experience a negative impact due to the streetcar. Only 4.8 percent of respondents agreed with this, while 95.2 percent believed that no areas will become less attractive for development. The reason for the single response expecting a negative effect is because of temporary streetcar right-of-way construction-related impacts.

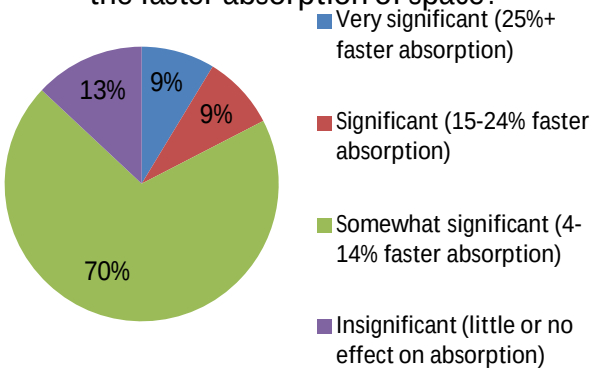


In the next five questions, developers were asked in general whether they think the streetcar service would provide a market advantage along the Streetcar Corridor for: obtaining financing; a faster absorption of space, a positive impact on net rent levels; lead to larger transactions (such as leases of multiple floors to quality tenants); and a reduction in parking requirements. Opinions were divided on whether the streetcar would make it easier to obtain financing. The responding developers believed that the streetcar would have a somewhat significant effect on the faster absorption of space (69.6 percent), the net rent level (65.2 percent), leading to larger transactions (47.6 percent), and a reduction in parking (39.1 percent).

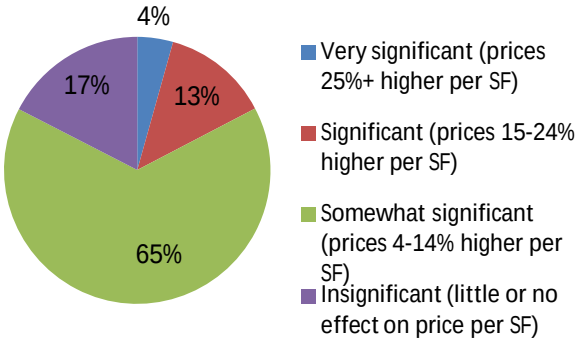
Would the presence of streetcar service make it easier to obtain financing for projects along the corridor?



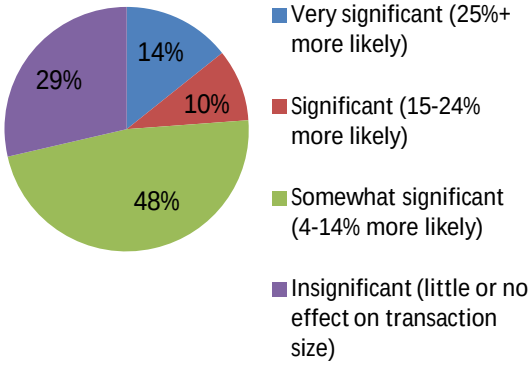
Would the streetcar service provide a market advantage along the corridor for the faster absorption of space?



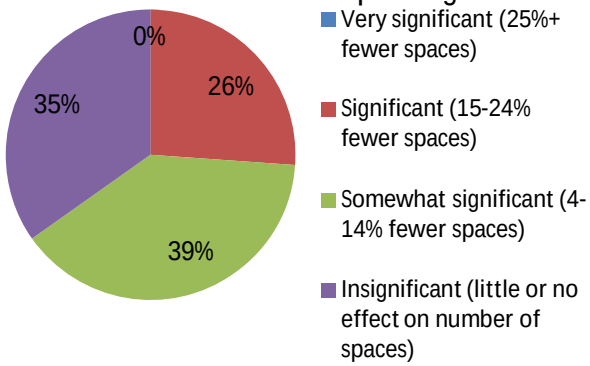
Would the streetcar service provide a market advantage along the corridor for a positive impact on net rent level?



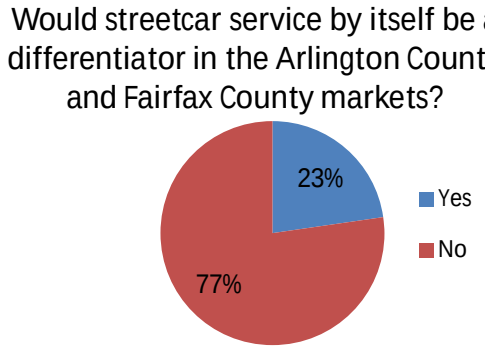
Would the streetcar service provide a market advantage along the corridor for leading to larger transactions (i.e. leases of multiple floors to quality tenants)?



Would the streetcar service provide a market advantage along the corridor for the reduction of parking?

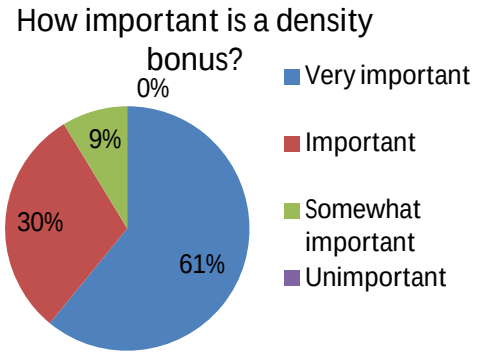


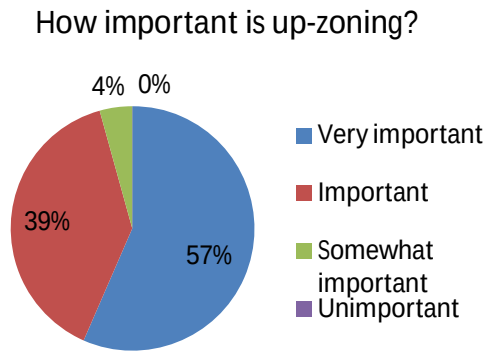
When asked whether the streetcar would be a differentiator in the Arlington County and Fairfax County markets, only 22.7 percent thought it would be. Respondents provided a variety of responses as to why they answered the way they did. A common response is that while the streetcar will be an important factor in the market, it will not be the sole reason that developers choose the corridor. An important factor mentioned many times is that density will promote redevelopment of the corridor. The existing bus service is adequate, but having fixed rail will motivate investors in a way that bus service does not because rail has perception of higher accessibility.

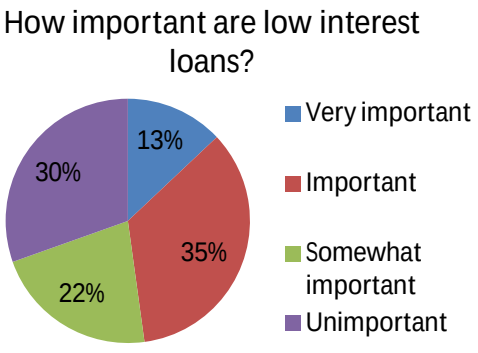


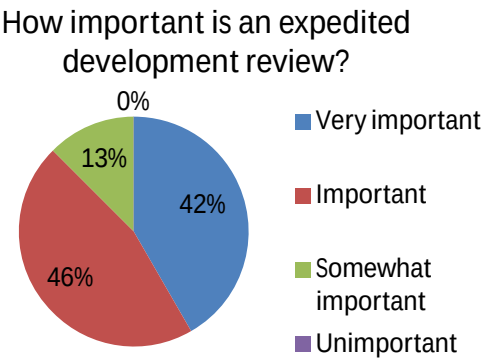
A.3.4 Policies and Incentives

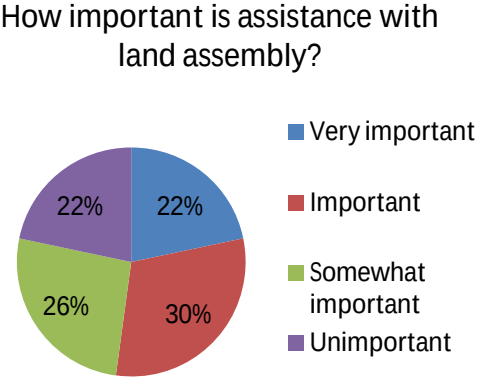
In order to understand how policies can affect developers' opinions and plans, they were asked how important the other types of hypothetical incentives are that could be combined with streetcar service. The incentives include: density bonus, up-zoning, low-interest loans, expedited development reviews, assistance with land assembly, and joint development programs. The developers overwhelmingly agreed that density bonus (60.9 percent) and up-zoning (56.5 percent) were very important. The low interest loans, an expedited review process, and assistance with land assembly were all deemed important (34.8 percent, 45.8 percent, and 30.4 percent respectively). Finally, the consensus is that joint development programs are somewhat important (43.5 percent).

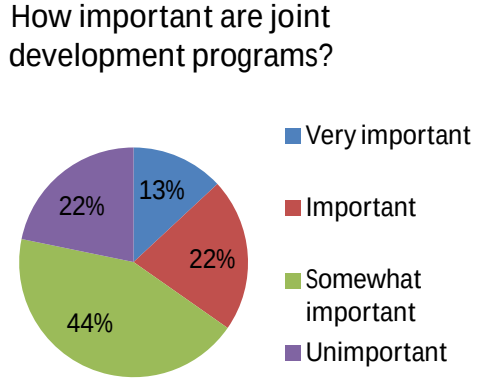




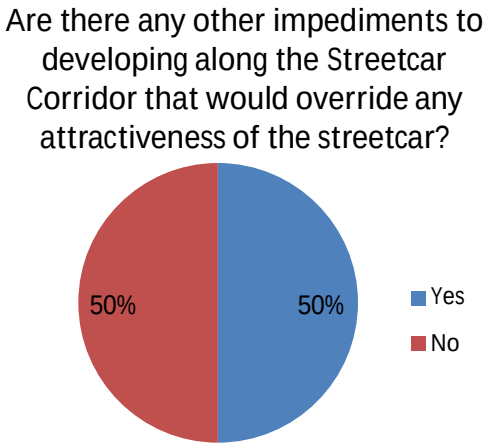








On the flip side of incentives, the developers were asked whether there were any impediments to developing along the corridor that would override any potential attractiveness from the streetcar. Half of the responses were yes and half were no. All of those who responded yes provided reasons, including: congestion; opposition and negative public perception from affordable housing and historic preservation groups; unrealistic minimum affordable housing requirements; inflexibility from the FBC and not enough density; Arlington County; lack of quality area schools; and general market conditions.



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Appendix B. Document Review

Appendix B: Documents Reviewed

The documents selected for this literature review include updates to local streetcar studies, neighborhood plans for the impacted communities of Columbia Pike and Baileys Crossroads, and peer streetcar development reports. Arlington and Fairfax Counties provided any updated documentation needed. All relevant documents were discussed with and approved by the county staffs.

Upon reading through the literature available relating to the Columbia Pike Streetcar Project, the majority of the documents fell into three primary categories: documents that discussed the property premiums and growth due to transit, documents discussing funding mechanisms, and neighborhood planning studies. They are presented in Table 6-3.

Summaries for each document follow the table. The summaries are presented in the order shown in Table B-1.

Table B-1. List of Documents Reviewed by Type

Document Name	Published	Agency	Author
Property Premium			
DC Streetcar Land Use Study, Phase 1	January 2012	DC Office of Planning	Goody Clancy
Cincinnati Streetcar TIGER III Economic Analysis Supplemental Documentation	October 2011	City of Cincinnati	HDR
Cincinnati Streetcar Feasibility Study: Risk Analysis-Investment and Finance Economics and Policy; Chapter 5: Economic Development Benefits	November 2007	City of Cincinnati	HDR
Portland Streetcar Development Oriented Transit	April 2008	Office of Transportation and Portland Streetcar, Inc.	Office of Transportation and Portland Streetcar, Inc.
Streetcar-Development Linkage: The Portland Streetcar Loop	February 2008	City of Portland Office of Transportation	E.D. Hovee & Company
Walking the Walk: How Walkability Raises Home Values in U.S. Cities	August 2009	CEOs for Cities	Joe Cortright
Property Premium and Funding Mechanisms			
Value Capture and Tax-Increment Financing Options for Streetcar Construction, Appendix II: Streetcar Value Change Case Studies (Tampa, Seattle, and Portland)	June 2009	DC Surface Transit (DCST)	The Brookings Institution, HDR, Re-Connecting America, and RCLCO
TCRP 86: Relationships Between Streetcars and the Built Environment	2010	TCRP	BAE Urban Economics, Inc.
Charlotte Streetcar Economic Development Study (case studies)	April 2009	City of Charlotte	BAE Urban Economics, Inc.
Neighborhood Studies			
Columbia Pike Land Use & Housing Study	May 2011	Arlington County	Dover, Kohl & Partners
Columbia Pike Neighborhoods Plan, Draft Policy Framework	October 2011	Arlington County	Dover, Kohl, & Partners Consultant Team

Charting a Way Forward - Preserving Market Rate Affordable Housing in Northern Virginia's Inner Suburbs	2011	Northern Virginia Affordable Housing Alliance	Angie Rodgers
Baileys Crossroads Planning Study Preferred Concept Transportation Evaluation	January 2010	Fairfax County	RK&K Engineers

Note: Information in the policy section was obtained from studies within the Neighborhood, Property Premium, and Funding Mechanism sources

Property Premium

Goody Clancy et al, District of Columbia Streetcar Land Use Study, Phase 1, District of Columbia Office of Planning, January 2012.

http://planning.dc.gov/DC/Planning/Planning%20Publication%20Files/OP/Citywide/citywide_pdfs/FINAL%20for%20Web_Screen%20View.pdf

Summary

The *District of Columbia Streetcar Land Use Study* was initiated to investigate the impacts of the proposed streetcar network, including land use, job access, quality of life, housing affordability, and fiscal impacts, as well as potential effects of the system on real estate development. In addition, the study identifies land use opportunities, corridor adjustments, and other actions that could improve the benefits of the system or address challenges posed by the system. The study was intended to help assess the value of the streetcar system and whether the land use benefits could be used to help fund the construction of the system.

Methodology

To assess the benefits of the streetcar system, the study methodology considered all streetcar corridors in the system plan and divided them into nine corridors that share similar land use characteristics. The study considered the impacts associated with similar streetcar systems in Portland, San Francisco, and Seattle, but DC-specific analysis was performed to estimate the office, residential, and retail market impacts and the potential for value-capture financing mechanisms.

To estimate the impacts for the DC Streetcar System, the study had to make several assumptions about the study area, benefit period, and zoning along the corridor. As a result, the impact area for the study included areas within ¼ mile of the streetcar alignments, excluding those areas that are within ¼ mile of a Metrorail station. The forecasted order-of-magnitude real estate value and market demand increase attributable to the streetcar were estimated over a 10-year forecast period in $2010, assuming the full system was in operation beginning in 2010 and no zoning changes.

Results

The quantitative streetcar benefits considered in the study include:

- Improves access to premium transit. Approximately 72,000 residents who are not within a ¼ mile of a Metrorail station will now be within a ¼ mile of a streetcar alignment. Additionally, the streetcar improves transportation options for the 44 percent of corridor households that do not have access to a car.
- Reduces transportation costs. Offers households within a ¼ mile of the streetcar a reasonable opportunity to reduce car ownership, which cost households approximately $8,500 in 2010 to own and operate.
- Improves access to jobs. The streetcar system is anticipated to bring an additional 72,000 households within a walkable distance of premium transit, which provides them with access to more than 85 percent of DC's office jobs and more than 50 percent of all jobs in the city.
- Attracts new jobs and residents. The streetcar system is anticipated to add or retain 14,000 households in DC over a 10-year period. The preliminary projections for the study indicate that the streetcar system would attract an additional 6,300 to 7,700 jobs and 4,000 to 12,000 households to the District over a 10-year period. Similarly, the study estimates that the proportion of District workers who also live in the city could increase from 31.5 percent to approximately 34 percent over 20 years, generating an increase in income tax revenues.

The study also states that for every 1,000 additional households, the development of one new block (30,000 to 50,000 SF) of "main street" retail space can be developed.

- Strengthens real estate values. The streetcar system is anticipated to add $5 to $7 billion to existing property values and bring an additional $5 to $8 billion in new development during the 10-year forecast period. The greatest impacts are generated in areas that improve access to underdeveloped areas, encourage expansion of existing commercial districts by extending the walkability of the district, and increase accessibility to areas with existing amenities.
- Residential impacts. The streetcar system is expected to increase the value of existing residential properties by $1.0 to $1.6 billion. This represents a 5 to 12 percent increase in housing values along each line, with values likely to be higher in areas that have many prime redevelopment sites. It is important to note that the 5 to 12 percent projection is for individual property values. A more

conservative 2.5 to 5 percent for residential and 5 to 10 percent for commercial was used for corridor-wide estimates.

- Office impacts. The streetcar system would generate approximately $1.0 to $1.3 billion in office development within the next 10 years (both new development and redevelopment). The increase in demand for office development within the corridors is expected to be 2.5 to 3.0 million SF, or 15 percent. More than 80 percent of this demand would occur in areas along the streetcar corridor that have significant undeveloped land and poor transit access. Additionally, the streetcar system would increase the value of existing office values by $3.7 to $2.8 billion, representing an increase between 2 and 10 percent along the individual corridors.
- Retail impacts. The streetcar system would add between $305 and $373 million in retail spending within the District, generating 1.1 to 1.3 million SF of new retail space after 10 years.
- Increase revenue to the District. By strengthening real estate values, adding new residents and jobs, and increasing retail sales, the streetcar is likely to generate an additional $238 to $291 million in annual new revenue within 10 years, most of which is comprised of property tax revenue gains. The additional income tax generated by new residents is projected to be between $65 and $80 million annually after build out, while additional retail sales are expected to generate approximately $14 million per year in new tax revenue.

While the benefits estimated by the study are significant, it also addressed potential challenges to successfully implementing the streetcar system. The challenges considered and to be studied further during Phase II include:

- Housing affordability. The 5 to 12 percent increase in property values along the streetcar corridors has the potential to dislocate lower income families. The study estimated that nearly 1/3 of subareas have a higher chance of experiencing a strong upward pressure on housing prices, while approximately ½ would face more moderate upward price pressures. As a result the District should monitor these areas and be prepared to implement measures necessary to promote affordability. The study discussed several strategies the District could undertake to promote and preserve affordable housing, including:
- Mandatory inclusionary zoning. The District's 2009 ordinance would apply to most new housing developments with more than 10 units and would require that more than 8 percent of new units be affordable.
- Use public land. The District could use public land that is vacant or in need of redevelopment for mixed income housing with specific affordability targets. The study identified 240 acres that could be eligible for this type of use.
- Targeted use of tax-credit and other affordable housing funds.
- Preserve existing public, subsidized, and/or other affordable housing.
- Encourage creation of ADUs. Within existing properties, encourage the conversion of basements and garages to apartments in well-established neighborhoods.
- Potential market shifts within the District. The streetcar could dislocate existing businesses or new business from other non-streetcar areas. This is particularly true for office space, where approximately 10 percent of the SF attracted to the streetcar corridor is likely to be attracted from elsewhere in the District. As a result, the District should begin planning for redevelopment opportunities for locations without direct streetcar access, including:
- Identify development uses that do not seek premium transit locations. Then develop a strategy to direct this investment to neighborhoods outside the streetcar corridors.
- Review the District's zoning and development policy. Make sure that these promote mixed-use and transit-oriented development in areas where it has not traditionally occurred.
- Routing and right-of-way issues. The streetcar project could cause the loss of some street parking and add to traffic congestion since the streetcars will travel in existing right-of-way. Mitigation measures such as route adjustments, one way streets, coordinated street markings for bikes and streetcars, and alternative parking options should be evaluated.

The study also discussed initial strategies and tools for optimizing land use benefits along the streetcar corridors, which will be explored in more detail during Phase II of the study. These strategies and tools include:

- Make use of existing and new development. This development can support neighborhood retail, redeveloped declining properties, and attract housing and jobs to the corridors.
- Optimize existing and potential land use policies and design guidelines. This will help ensure that zoning supports the development opportunities provided by the streetcar and that the development improves community character and quality. This can include changes in allowable densities, recommendations for changes in land use mix, mandatory inclusionary zoning for affordable housing, and development of design guidelines.

- Coordinate with other transportation investments. Coordinate with other modes, including bike share, to facilitate transfers, share operating lanes and stops, and integrate transportation with the neighboring land uses.
- Improve access to the streetcar for pedestrians and bicyclists. The new development, streets, and sidewalks must be safe and attractive for pedestrians and cyclists to encourage their use.
- Use multiple mechanisms to capture the value of new development to fund construction and/or operation of the system. Consider using the additional property tax revenues generated from increasing the value of existing property as well as new development to issue bonds to fund the construction of the system. The study estimates that benefits of real estate investments associated with the streetcar system could fund at least 40 to 60 percent of the streetcar system's estimated $1.5 billion cost. Additionally, business improvement districts may be formed to help fund construction or operation.

Conclusions

This study provides important insight and estimates of the economic impacts associated with the DC streetcar system, particularly in terms of jobs, real estate, and fiscal impacts. The quantitative impacts estimated for this project are particularly relevant to the Columbia Pike Transit Initiative given its proximity to the corridor as well as some of the characteristics of the streetcar corridors, including older residential and commercial districts, lack of previous premium transit access, and strong opportunities for redevelopment. However, when looking at the District estimates, it is important to recognize that the proposed streetcar system and strong interaction with Metrorail and the District's core downtown is different from Columbia Pike. The Columbia Pike Corridor is not part of a proposed streetcar system, and the connections to the jobs and housing associated with the terminals of Pentagon City and Baileys Crossroads themselves need attention in terms of walkability and transit connections.

HDR, Cincinnati Streetcar Project TIGER III Economic Analysis Supplementary Documentation, City of Cincinnati, October 31, 2011.

http://www.cincinnati-oh.gov/noncms/projects/streetcar/docs/EconomicAnalysis.pdf

Summary

Chapter 5 of the *Cincinnati Streetcar Risk Analysis-Investment and Finance Economics and Policy Report* estimates the potential for community economic development benefits due to the implementation of the streetcar project. It outlines the methodology, results, and risk analysis applied during the study.

Methodology

The methodology used to estimate the potential transit premium associated with the Cincinnati Streetcar project is based on a combination of hedonic modeling of the experiences in other cities and a survey of the region and interviews with local stakeholders. As a result, the growth rates experienced in other cities were modified using local market knowledge obtained from an economic development workshop with local stakeholders as well as other known factors such as historic property growth rates, population change estimates, and the timeframe for streetcar implementation.

The corridor was divided into three market zones and seven sections so that development and transit premium effects could be estimated within a three block radius of the alignment for each section. For each section, the economic development panel rated the following characteristics as Low, Medium, or High:

- Current market strength
- Expected accessibility improvement
- Residential desirability
- Commercial desirability
- Supportive zoning
- Available land for redevelopment
- Major attractions
- Public sector investment/support
- Private sector investment/support

Results

The analysis' conclusions on the transit premium associated with properties for the seven sections are as follows:

Market Zone	Total Residential Premium	Total Commercial Premium
A1	11.70%	9.70%
A2	13.50%	10.40%
A3	9.50%	9.50%
B1	8.80%	9.80%
B2	11.20%	10.20%
C1	15.20%	15.20%
C2	9.40%	11.40%
C3	10.90%	10.90%

The streetcar impacts were projected to begin two years before the availability of the system (anticipatory growth) and to continue three years after the system opened. The property levels due to the streetcar were anticipated to stabilize after this five-year period. As a result, the economic benefits for both residential and commercial properties were expected to be $378.2 million ($107.2M for residential and $270.4M for commercial), with a 10 percent chance of exceeding $509.1 million

Conclusions

This report summarized the transit premium percentages applied during the *Cincinnati Streetcar Feasibility Study* for each market zone along the corridor. The greatest gains were seen in areas that are currently more distressed, and therefore, have greater opportunities for redevelopment. The transit premiums applied were based on a literature review of property value gains experienced as a result of other transit investments as well as the economic development workshop panel's thoughts on the potential for development growth in each market area along the corridor. As a result, the transit premium applied in the analysis can serve as a reasonability test to the findings of the Columbia Pike Transit Initiative ROI Study findings.

Office of Transportation and Portland Streetcar, Inc., Portland Streetcar Development Oriented Transit, April 2008.

http://www.portlandstreetcar.org/pdf/development_200804_report.pdf

Summary

This document provides a summary of the Portland Streetcar's impacts on development, development density, lessons learned, and the values that helped shape the implementation of the streetcar system. The heart of the message is that since 1997 (the year the original streetcar alignment was identified) the properties located along the corridor have undergone a significant transformation, including:

- Properties located within 2 blocks of the alignment have experienced investments totaling $3.5 billion.
- These properties have also seen the construction of 10,212 new housing units and 5.4 million square feet of office, institutional, retail, and hotel construction.
- 55 percent of all Portland CBD development has occurred within 1 block of the alignment.
- New residential development is being built with significantly lower parking ratios than anywhere else in the region.

Methodology

The document does not have a specific methodology because it is a summary of various studies and findings associated with the Portland Streetcar implementation.

Results

The findings summarized in the document focus on the following key areas:

- Development density. Prior to 1997, new development projects contained less than half of the allowable density for CBD sites. After 1997, new development had an average of 90 percent of the Floor Area Ratio (FAR) potential within 1 block of the streetcar alignment. Additionally, prior to the streetcar the 1-block corridor captured 19 percent of all new CBD development; while, after the streetcar, the 1-block corridor has captured 55 percent of all new CBD development.

- Development impacts. The streetcar has revitalized a corridor that included a contaminated rail yard and an area of largely under-used or vacant industrial land requiring environmental remediation. The corridor now has strong neighborhoods with new grocery stores, restaurants, galleries, shops, banks, and multifamily housing. The streetcar has managed to help improve business activity along the corridor as well as maintain auto- access.
- Development lessons learned. The success of Portland in linking transportation investments with development can be replicated elsewhere, but requires cities with one or more large development sites and owners who are willing to work together to advance the region/corridor's vision. The city has to provide a stable source of funding for public improvements; while, the developers have to contribute to the infrastructure cost and commit to building higher density development, including mixed-income housing to meet the city's housing goals. The development agreement in place in Portland tied development densities to public improvements, increasing the minimum housing density incrementally from 15 to 87 units per acre when the Lovejoy Viaduct was deconstructed, to 109 units/acre when the streetcar construction commenced, and 131 units/acre when the first neighborhood park was built. Additionally, the developers contributed $19.4 million towards the streetcar and other critical investments in the corridor through a Local Improvement District (LID).
- Underlying values. The development along the streetcar corridor was designed to improve the livability of the corridor, and in addition to higher density and access improvements, the corridor saw public and private efforts to ensure affordable housing, public open spaces, Brownfield redevelopment, high quality urban design, and public art. Design tradeoffs were often made to fit the streetcar into the scale and traffic patterns of the neighborhoods. In addition, the streetcar system was designed to be constructed and operated in a cost effective manner, including using available ROW, constructing essential facilities only, avoiding the costly relocation of utilities, and constructing stations that were similar to bus stops.

Conclusions

This document highlights some of the key components necessary to transfer the streetcar and development success experienced in Portland to other cities. It summarized the development impacts as well as the lessons learned and underlying values that underpinned the implementation of the streetcar and the creation of the revitalization of the streetcar corridor. These lessons and values could be important considerations for the Columbia Pike Transit Initiative project as it continues through the final planning stages and into construction.

E.D. Hovee & Company, LLC, Streetcar-Development Linkage: The Portland Streetcar Loop, City of Portland Office of Transportation, February 2008.

http://www.reconnectingamerica.org/assets/Hovee-Report-Eastside-2008.pdf

Summary

This report offers suggestions for evaluating the "streetcar-economic development nexus" for streetcar projects seeking federal funding. It addresses the relationship between streetcar and economic development as experienced in Portland, and then focuses on how economic development can be measured for Small Starts projects. To help demonstrate how these measures can be quantified, the report provides details from the Portland Streetcar Loop project, an extension of the Portland streetcar system to the eastside of Portland's Central City.

Methodology

The methodology used to produce the report is based largely on the streetcar-economic development experience of the initial Portland Streetcar Line. This initial streetcar line promoted high density development along the corridor, and this density then provided significant public and private returns. The report uses analysis of development impacts associated with this initial line as well as interviews with owners and developers to solidify the factors and potential impacts associated with the Portland Streetcar Loop extension project.

Results

Through interviews with owners and developers along this initial streetcar segment, the following factors influence how streetcar investment supports development:

- Timing. Developers are willing to invest in an area sooner with the implementation of a streetcar project because it is a sign of public-private sector confidence.
- Scale. Streetcar increases developers' comfort with building larger buildings and accepting the risks associated with these larger developments, including more space to lease/sell and higher construction costs.

- Pricing. Developers are more willing to bring higher-end development to the market with the implementation of a streetcar project because the convenience and cost savings associated with locating in a streetcar corridor bring higher rents and sales prices.

The high density development that has occurred along Portland's initial streetcar corridor has been tied to numerous public benefits, including:

- Reduced auto dependence. Residents of mixed-use neighborhoods with good transit service are less likely to use autos than residents with just good transit service. As a result, the residents attracted to the corridor use their cars less frequently, significantly reducing VMT in the region. It was estimated that the corridor has reduced VMT in Portland by 70 million miles annually.
- Reduced infrastructure costs. By locating new residents in the streetcar corridor compared to a new development at the edge of the metro region, infrastructure costs are significantly reduced as much of the infrastructure is already in place in the streetcar corridor. On a cost per added household basis, the study estimates that the streetcar project was $14,000 per new household compared to a transportation infrastructure cost between $76,000 and $112,000 per household for the new suburban development.
- Reduced sprawl. Similarly, the new households attracted to the streetcar corridor require significantly less land than a new suburban development. The new residential development along the streetcar corridor occupies 53 acres compared to an additional 879 acres needed to meet the average lot size for each household in a new suburban development.
- Reduced carbon footprint. The study reports that high density urban development results in a 64 percent savings in transportation CO2 emissions and 45 percent savings in development footprint compared to a traditional suburban development. These savings are obtained through reduced VMT and less land and building area.
- Business and job growth. Dense, mixed-use development is increasingly seen as an economic generator through its ability to attract both businesses and residents. It has been shown to be attractive to older empty nesters, and is increasingly attractive to young professionals.

As a result of these findings from the initial Portland Streetcar corridor, the report identified four primary economic development criteria that could be evaluated as part of the Small Starts process for streetcar projects. These include:

- How does the streetcar investment promote and expand employment centers? This criterion can highlight the current employment and employment density along the corridor as well as the expected employment and density with the streetcar corridor. In addition, it should highlight parcels or areas with significant development potential and development planning, including any specific investments that are planned. Additionally, it should highlight how the project integrates with the existing transit system and how it connects growing neighborhoods and employment.
- Does the regulatory environment uniformly impel higher density development? This criterion should address whether the current zoning allows for density (floor area ratios) that is significantly greater than that of the current development and that the comprehensive plan and zoning allows for mixed use development.
- Do market conditions support higher density? Portland's experience has indicated that market conditions that support higher density include: increasing investment interest, capitalizing on low improvement to land value ratios, encouragement of new development along a proposed alignment, and developer confidence. As a result, this criterion should address how well the corridor meets these market conditions or others that support higher density development.
- What public incentives beyond transit are available to support high density development? Portland's experience demonstrated the importance of public commitment to urban development through the use of:
  - *Public-private development agreements.* For the initial streetcar corridor in Portland, density minimums were increased with the implementation of different public investments.
  - *Streetscape investments.* Commitment to creating pedestrian-oriented environments is also important. These investments can include traffic calming measures, pedestrian crossings, sidewalk improvements, and connections to bike trails and green spaces.
  - *Urban renewal districts.* These districts help generate funding for infrastructure investment as well as parking and roadway improvements that support businesses located along the corridor.

To evaluate these criteria, the report suggested the following benefit metrics that could be applied to future Small Start streetcar projects:

- Density of new development. The report suggests that for streetcars a minimum of 40 people per acre throughout the corridor and 60 people per acre for the blocks fronting the alignment.
- Return on investment. Measure the total estimated redevelopment investment and compare to the streetcar investment cost.
- Redevelopment potential. Report the percentage of parcels or land area within the corridor with an improvement to land valuation ratio of less than 0.5 to 1.0.
- Zoned development capacity. Report the planned post-streetcar zoned capacity within the streetcar corridor in comparison to the current capacity.
- VMT reduction. Report how the improved transit accessibility and higher density mixed use development contribute to the reduction in VMT.
- Reduced carbon footprint. Report the reduction in CO2 emissions associated with reduced VMT and urban building efficiencies.

Conclusions

The report offers some important insights into ways to measure economic development benefits and provides a real-life example in how the Portland Streetcar Loop met these measures. While the specific methodology used to measure each of the benefits is not always discussed, it provides some thoughts on why these measures are important and how other potential streetcar projects may be able to capitalize on these benefits as part of their project implementation. These lessons learned from Portland are directly applicable to the Columbia Pike Transit Initiative project.

Cortright, Joe, Walking the Walk: How Walkability Raises Home Values in U.S. Cities, CEOs for Cities, August 2009.

http://www.ceosforcities.org/files/WalkingTheWalk_CEOsforCities1.pdf

Summary

The purpose of this study was to investigate whether Walk Scores of residences in the United States affect home values. Home sale prices and Walk Scores were calculated and compared in 15 metropolitan areas in the country, including: Austin-Round Rock, TX; Bakersfield, CA; Charlotte-Gastonia-Concord, NC-SC; Chicago-Naperville-Joliet, IL-IN-WI; Dallas-Fort Worth-Arlington, TX; Fresno, CA; Jacksonville, FL; Las Vegas-Paradise, NV; Phoenix-Mesa-Scottsdale, AZ; Sacramento—Arden-Arcade—Roseville, CA; San Francisco-Oakland-Fremont, CA; Seattle-Tacoma-Bellevue, WA; Stockton, CA; Tucson, AZ; and Washington-Arlington-Alexandria, DC-VA-MD-WV.

Methodology

The Walk Score algorithm was used to compare the walkability of 93,725 home sales in 15 markets in the United States from 2006 to 2008. The premium on the home correlating to the walk score was investigated using hedonic regression techniques. The statistical calculation controlled for both housing and neighborhood characteristics.

Walk Score uses Google maps to find the straight-line distance between homes and 13 destinations, including: grocery stores, coffee shops, movie theaters, parks, bookstores, drug stores, clothing and music stores, restaurants, bars, schools, libraries, fitness facilities, and hardware stores. The home is awarded points for the number of destinations between ¼ and 1 mile away. More points are given for destinations within ¼ mile, and locations more than 1 mile away are ignored. The closest of each type of destination is awarded an equal number of points, with duplicates of any type being ignored. The score is then normalized between 0 and 100 to yield the Walk Score.

Using hedonic modeling methods, individual qualities of homes (such as number of bedrooms and square footage) can be divided up to see how much each contributes to the total cost, including the degree to which the location is walkable. The log-linear specification for the hedonic model provided a better fit than the linear version.

Results

The study found that the walkability of a neighborhood is directly tied to the price, and homes with better than average walkability scores are worth $4,000-$34,000 more than comparable homes with less than average walkability. Walk scores are between 0 and 100, representing the range between a location being completely car-dependent and the most walkable, respectively.

Of the 15 markets, 13 showed a positive correlation between higher walkability and an increase in home values. The 13 with a positive correlation showed, on average, that a walk score increase of 1 point yielded a home value increase of between $700 and $3,000. Walkability scores tended to be higher in urbanized areas with better access to public transportation. Las Vegas showed a negative correlation between walkability and home values, and Bakersfield, CA showed no correlation.

Few studies look specifically at walkability relating to home prices, but the three mentioned here measure aspects closely tied to walkability.

- A study in Austin, TX found that home prices rise by $8,000 per mile as they get closer to the central business district (CBD) and similarly rise by $4,700 per minute saved in daily commute travel time.
- A study in Portland, OR found that homes built before 1940 appreciated more than those constructed after 1940, showing that the grid street-pattern typical of that time is preferred to the windy cul-de-sacs found in subdivisions built after 1940.
- Studies have found that buyers are willing to pay 4 percent to 15 percent more for homes located in areas with grid-like streets, mixed-use amenities, and higher densities. This is more closely related to walkability than either of the other two studies.

Conclusions

A survey by the National Association of Realtors in 2007 found that 57 percent of Americans supported walkability through mixed-use developments reducing the necessity of cars. Walkability scores have a positive correlation with housing price both in metropolitan areas with low walkability and high. The walkability has a higher effect on price, however, in more populous and denser cities, which also tend to have larger public transportation systems. In Arlington, the median walk score is 71 and the 75th percentile is 82. A home in the 75th percentile is worth $19,028 more than a home with the median walkability score. According to walkscore.com, the Columbia Pike corridor currently has a Walk Score of 78.

One recommendation for strengthening a neighborhood's value is to make it more walkable, thus creating a greater tax base for the counties than a less walkable one. However, in the case of the Columbia Pike Transit Initiative Corridor, increasing the walkability in the neighborhoods will drive values up and could drive affordable housing out.

Property Premium and Funding Mechanisms

The Brookings Institution et al, Value Capture and Tax-Increment Financing Options for Streetcar Construction, DC Surface Transit, June 2009.

http://www.reconnectingamerica.org/assets/Uploads/brookingsvalueaddedtif2009.pdf

Summary

The DC Surface Transit's Value Capture and Tax-Increment Financing (TIF) Options for Streetcar Construction report summarized the findings of a preliminary assessment on non-government financing alternatives for DC's streetcar system. The report used the H Street and Benning Road corridor (from Minnesota Avenue Metrorail Station to Union Station) as the sample study corridor to evaluate the following forms of TIF and private value capture financing:

- Tax Increment Financing (TIF). Assumes the tax revenue increases that result from higher property values can be used to pay the debt service on municipal debt issued for the construction of the streetcar.
- Special Assessment District – set cash contribution. Assumes an upfront negotiated cash contribution from private property owners can be used to pay for construction and/or the debt service on municipal debt issued for the construction of the streetcar.
- Special Assessment District – set supplemental tax rate. Assumes a negotiated supplemental property tax rate is applied to private property owners and can be used to pay the debt service on municipal debt issued for the construction of the streetcar.
- Limited Partnership. This is an approach that has not been implemented before. It involves having the sponsoring agency take title to a negotiated limited partnership for each affected parcel. The sponsoring agency ownership would be structured so that any cash flow that results from the increased value of the property would be shared (based on ownership percentage) with the sponsoring agency. These additional cash flows can be used to pay the debt service on municipal debt issued for the construction of the streetcar.

Methodology

A critical assumption in the study's evaluation of the potential for value capture and TIF funding options for the DC streetcar system is the potential for economic development growth along the corridors, particularly in terms of increases in property values. As a result, the study team performed case studies on the economic development growth experienced along the streetcar corridors in Portland, Seattle, and Tampa to help estimate the potential for growth in DC. These three cities were selected to maximize their applicability to the H Street and Benning Road land use and real estate conditions.

The evaluation of the financing options also involved a market assessment of the current property values for the parcels located along the H Street and Benning Road streetcar alignment. The case study results on streetcar's impacts on property values were then applied to these parcels to determine the possible financial results for the financing scenarios over a 20-year period.

Results

The results of the value capture financing options evaluated are summarized below:

- Public Sector TIF. If 100 percent of the bondable amount supported by a TIF was applied, 91 percent of the construction costs would be covered ($128 million of the $140 million project cost). As a result, this approach could make a sizeable contribution towards the construction of the streetcar line; however, it would not leave any revenues to help support the public services needed along the corridor.
- Special Assessment District – set cash contribution. To fund 1/3 of the project cost, a special assessment of 4.6 percent on the current assessed value of all private property would be required. This would not require the issuance of debt by the city as the cash payments could be used directly to pay for the construction. However, this approach only works if the property owners are well-capitalized and are willing and able to make the payment up front. This type of financing is usually better suited to areas with a few large land owners.
- Special Assessment District – set tax rate. To fund 1/3 of the project cost, the supplemental tax rate would have to be 16 percent over the current property tax rate. This rate is slightly higher than the 2 to 10 percent property tax rate increases associated with most Business Improvement Districts.
- Limited Partnership. To fund 1/3 of the project costs, a sharing percentage of 5.3 percent of the value increase projected by private property owners would be required. Alternately, a 16 percent sharing rate would cover the total cost of the project. This approach has not been tried before; however, the study points out that the 5.3 percent rate is less than a private equity investor would demand for a comparable deal. Since this would be a new funding mechanism, there likely would be several hurdles to overcome, including: privacy issues, no legal precedent for this approach, and setting the date for establishing the base value.

The review of the Tampa, Portland, and Seattle case studies revealed several important findings in regards to the impacts of streetcar investments. First, underutilized properties close to downtown that are just far enough outside not to be walkable to downtown are seen as potential development districts with the introduction of a streetcar project. Second, the property values of single-family residences increase at a slower rate than industrial, commercial, and multi-family properties. In particular, these residences generally do not experience increases in value until after construction, where industrial, commercial, and multi-family parcels often experience significant increases during the planning stage. Lastly, commercial properties did not experience as much value growth as vacant land. This could be due to the fact that old industrial and commercial districts that are seen as inexpensive and easily changed are necessary for the redevelopment of neighborhoods. Additionally, since commercial properties in older industrial areas tend to contain gas stations and auto body shops as opposed to more traditional retail shopping districts, these commercial areas are less likely to change than more traditional retail commercial districts.

The bullets below summarize the specific case study findings for each city.

- Tampa (2002 -2008)
- Over $1 billion in new and planned development along the streetcar line.
- Vacant properties and multifamily properties experienced the greatest increase in value.
- Much of the development occurred on large industrial or vacant parcels that were ready for redevelopment.
- However, it is important to point out that the growth generally seen along the corridor was less than that seen in Tampa as a whole. Areas where corridor growth was greater than the city as a whole included multi-family (25.5 percent) and hotel (34.9 percent).
- Seattle (2003-2008)
- Property values within three blocks of the alignment increased at higher rates than similar properties within the entire City of Seattle.
- Industrial and multi-family property values increased at faster rates and many redeveloped properties attracted office space to the corridor.
- Additionally, 28 percent of the properties (number and by acreage) within three blocks of the streetcar are owned by two owners.

- The greatest net growth in property values (i.e. growth beyond that experienced by the rest of the city) was seen in vacant land (70.0 percent), mixed use (35.1 percent), retail (15.0 percent), and office (13.4 percent).
- Portland (1997-2003 and 2003-2008)
- By 2008, $3.5 billion in new development had occurred along the initial streetcar line.
- This new development has also experienced development closer to the allowed FAR than properties farther away from the streetcar.
- More new development has occurred closer to the streetcar line than any other part of the Portland CBD.
- From 1997 (the announcement of the project) to 2003, large lot parcels of single family homes, commercial, and industrial parcels were valued much higher than multifamily and small lot parcels. The greatest net growth in property values (i.e. growth beyond that experienced by the rest of the city) was seen in vacant land (75.5 percent), parcels of 0.5 acres or more (68.6 percent), commercial (62.6 percent), industrial (29.1 percent), and multifamily (18.7 percent). Smaller parcels (less than 0.5 acres) saw net growth of 9.9 percent.
- Between 2003 and 2008, property values increased more dramatically than in the previous period; however, industrial and commercial properties were growing at a rate less than residential and vacant land. The greatest net growth in property values (i.e. growth beyond that experienced by the rest of the city) were seen in vacant land (43.9 percent), multifamily (36.4 percent), and smaller parcels (less than 0.5 acres) (19.8 percent).

Conclusion

The three case studies demonstrated that underdeveloped or vacant land generates the most significant increase in property values, largely due to its high potential for change and limited resistance or opposition to this change from residents. However, the study is careful to point out that a streetcar project cannot be expected to spur all the transformation of the corridor. All three cities implemented the streetcars in combination with other infrastructure improvements along the corridor. Additionally, the streetcar projects in these cities also provided a transportation value – getting people where they wanted to go in a timely, cost-effective manner.

The study also demonstrated that the projected property value increases can be used to help pay for the construction of the streetcar projects. However, most of these value capture mechanism are only able to pay for a portion of the project, so other funds (likely governmental) will be required to support the project.

These findings are important to the Columbia Pike Transit Initiative because they point out the type of areas that will benefit most from streetcar projects – particularly aging commercial and industrial areas with large parcels or vacant land available for redevelopment. Areas with primarily a residential focus may struggle to experience significant property value increases (particularly in terms of being able to capitalize on this growth for help financing the project), until after completion of the project. In addition, large residential neighborhoods may be less prone to support change than aging industrial and commercial corridors.

BAE Urban Economics, Inc., TCRP Synthesis 86: Relationships between Streetcars and the Built Environment, TCRP, 2010.
http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_syn_86.pdf

Summary

The *TCRP Synthesis 86* report on the relationships between streetcars and the built environment presents the results of a survey distributed to 13 streetcar systems recently rebuilt or extended in the United States that were. The report also provides a summary of five case studies that examine how streetcar investments affect the surrounding built environment. Value premium was investigated through a literature review and found values of 1 percent to over 100 percent, varying by land use.

Differing styles of streetcar systems exist due to the extent of the existing built environment and also the level of planning involved. Smaller systems came about from community or business initiatives and bigger systems functioned as part of a larger regional system. Nearly all of the survey respondents felt that the streetcar had a positive effect on attracting additional businesses and encouraging revitalization. However, few systems also reported results typically touted as benefits to streetcar, including an increasingly pedestrian-friendly streetscape, less parking for autos, and new bike lanes.

Methodology

The synthesis of streetcar systems in the United States included systems built within the past 20 years including systems in: Astoria, Oregon; Charlotte, North Carolina; Dallas, Texas (M-Line); Galveston, Texas; Kenosha, Wisconsin; Little Rock, Arkansas; Lowell, Massachusetts; Memphis, Tennessee; Portland, Oregon; San Pedro,

California; Savannah, Georgia; Seattle, Washington; Tacoma, Washington; and Tampa, Florida. The impacts discussed in the report are described both as the physical changes to the corridor and the economic development.

Results

The literature review investigated value premium impacts, amount and density of new development, economic development impacts, and limitations of the various literature sources. As streetcar investment is a more recent development, there is little analysis of this mode specifically, so other fixed guideway transit systems are analyzed as well (e.g. heavy rail, light rail, trolley/streetcar).

- Value Premium Impacts. A goal to capture the value before the system is constructed would allow the local and regional governments to share in the benefit that private property owners would get from the investment.
- United States. The property value premium associated with single family residential was 2 to 32 percent; condominium 2 to 18 percent; apartment 0 to 45 percent; office 9 to 120 percent; and retail 1 to 167 percent. It should be noted that negative premiums were also found. For example, within 900 feet of light rail stations in Santa Clara County, California, single family homes were valued 10.8 percent lower. A UC-Berkeley study found a range of 6.4 to over 40 percent, depending congestion, the local real estate market, and business cycles.
- Europe. From a study of 15 light rail systems, all but two experienced positive value premiums. The two negative premiums were due to noise. No range of values was provided.
- Amount and Density of New Development. The *Portland Streetcar Development Impacts* report measured the differences between the density built after the streetcar was constructed and the density previously allowed through zoning standards. Development happened faster and denser, though the development may have been influenced by other factors.
- Economic Development Impacts. A lack of research in this area was noted. There is a need for quantitative changes in retail sales, visitors, and job growth as a direct result of streetcars. The only actual measurable impact was for construction jobs. A development pattern noted was that in American and British cities, systems often are constructed where rail lines already exist, namely rundown industrial areas. Alternately, in France and Germany lines are constructed from scratch to connect the city centers to suburbs. French and German lines thus have lower potential for brand new development, while American and British lines have opportunities to revitalize industrial areas with new developments.
- Literature Limitations. The focus is on heavy and light rail systems. As the government continues to support streetcar as a driver of economic development, studies which report job creation, increased retail sales, and greater tax bases are needed.

Case studies of streetcar systems were conducted in: Kenosha, Wisconsin; Savannah, Georgia; Portland, Oregon; Memphis, Tennessee; and Seattle, Washington.

- Kenosha, Wisconsin. The 1.9-mile loop that opened in 2000 has 15 minute headways and served 65,700 passengers in 2008. There are 17 stops connecting the streetcar to the Chicago Metra commuter rail in the CBD on one end and a 69-acre mixed-use neighborhood on the other. The system cost $5.2 million with an 80 percent federal and 20 percent local funding split. The city's capital investment program tax increment financing (TIF) funded the remaining portion.
- Impacts on Existing Development. The city removed one-way streets to help promote business traffic around the alignment in the downtown area. Investments have been mostly for rehabilitation.
- Impacts on New Development. New multi-family homes, three museums, and parks have developed. Of the new 69-acre mixed-use neighborhood, only two of the 13 blocks remain undeveloped, and these sites have had a price reduction. The 400 condos initially sold quickly, but the sale of further residences has slowed due to the economy. Tourism has also increased in the corridor.
- Savannah, Georgia. The 1-mile segment opened in 2009 with seven stops along a main tourist boulevard. It offers free service. The streetcar was financed through the city's General Fund at $1.5 million, and ongoing operations are supported by the city's parking fees.
- Impacts on Existing and New Development. The system is too new to measure any changes, but because it is located in an historic area, investments will mostly be to existing buildings and new development is likely to be very limited.
- Impacts –Planned Economic Development. The streetcar line will eventually be part of a larger streetcar network. A 54-acre mixed-use development is planned and will connect to downtown by streetcar one day. Because of the historic nature of the city, existing historical buildings will need to be repurposed rather than replaced with new construction.
- Portland, Oregon. The system follows a 4-mile loop, with the first segment opening in 2001. The system has 46 stops and streetcars run every 12 minutes on weekdays. Ridership in the summer of

2008 averaged 10,000 per day. Funding sources for each segment varied, but overall was split with 79 percent from local funding sources, including 19 percent from local improvement districts (LIDs) and 21 percent from TIFs.

- Impacts on Existing Development. Survey respondents felt that new development in Portland was not attributable solely to the streetcar, but to an overarching and ongoing program to revitalize the downtown and become more transit-oriented. Portland also has a light rail system and buses in the area where streetcar lines are. There are numerous incentives for developers in the downtown.
- Impacts on New Development. Between 1997 and 2004, the blocks adjacent to the streetcar attracted more square feet of development at denser levels than had been attracted to the same locations before the streetcar was constructed there. The new development averaged 90 percent of the allowable floor area ratio (FAR) after 1997, as opposed to 34 percent of allowable FAR over the previous 100 years. It is important to note that the overall density in the city also increased during this time. The zone contained 19 percent of the existing development in Portland before 1997 and contained 60 percent of all new development after 1997, suggesting that the streetcar attracted a disproportionate share of new development, which made the sites more attractive near the tracks.
- Memphis, Tennessee. The trolley began operation in 1993 and consists of 7 miles of track and 24 stations over three lines. The system connects the CBD and a major medical complex. It was created to bring people back to a deteriorating pedestrian mall area, and streetcar was chosen over bus because it would keep pollution down along the corridors. Funding for the system came in part from FTA funds that were for an interstate that was never built. State, local, and private funds were also used.
- Impacts on Existing Development. Residential uses and population have increased, as hoped, and the system has revitalized the downtown area. A major joint development project resulted in $23 million being invested in apartments, commercial space, an Amtrak station, and a police station.
- *Property premiums* were estimated for 2002 and 2008 within a quarter-mile of all stops along one line of the system that opened in 2003. Results showed that residential properties increased in aggregate value more than 780 percent, while for the city as a whole they increased 24 percent. There was also a major condo-building boom at the time. Alternately, the appraisal value of commercial properties along the streetcar line experienced a decline between 2002 and 2008, while properties city-wide rose 17 percent. It is important to note the streetcar corridor has a high percentage of tax-exempt commercial properties. However, vacant commercial properties had a 70 percent increase in value along the corridor.
- Impacts on New Development. Since 1991, over $3 billion in new development projects were completed or are underway in the trolley corridors. The city is adopting a form based code to correspond to the trolley routes.
- Seattle, Washington. The Seattle Streetcar system is 1.3 miles, connecting downtown to Lake Union Park. It opened in 2007, and has experienced ridership of 30 percent greater than expected. The route cost $50.5 million and $25 million of it was funded through a LID.
- Impacts on Existing Development. A 60-acre plot has been sold off in pieces to be redeveloped. The area has seen more rental spaces leased than the rest of the city, even considering the recession. Developers privately funded streetscape projects to enhance pedestrian facilities and the city is investing in bicycle facilities.
- Impacts on New Development. Over 3 million square feet of new office space and 6,000 apartments have been developed. A good portion of the development along the corridor is seeking LEED certification. TIF is not allowed in Washington. Most development is being built at the maximum zoning levels, and the city is looking to increase density in the future. Major businesses (including Amazon.com, Whole Foods, and Group Health Coop) have been attracted to the area because of its campus-feel and convenient location.

Conclusions

Of the 13 streetcar systems analyzed, almost all of them believed that the streetcar had a positive impact on their city's built environment. A lack of data, however, kept all but one of the systems from knowing quantitatively whether that opinion was true. These systems relate to the Columbia Pike Streetcar Corridor in that they implemented a streetcar, but the existing built environments will vary by each city, as well as the purpose. The premiums, both qualitatively and quantitatively, are useful in helping to gauge what the Columbia Pike corridor might expect.

BAE Urban Economics, Charlotte Streetcar Economic Development Study, City of Charlotte, April 2009.

http://www.charmeck.org/city/charlotte/growthstrategy/Documents/CharlotteStreetcarEconomicStudy(BAE)pages1-40.pdf

Summary

The purpose of this study was to research the possible economic impacts of the proposed 10-mile Charlotte Streetcar line. Funding sources, peer streetcar systems, the Charlotte LYNX blue line, and developer opinions were analyzed. The City of Charlotte wanted to examine the ability of the proposed streetcar route to attract infill development along the corridor and the ability of the new developments to potentially finance the project.

Methodology

The study consisted of a literature review of other streetcar systems accompanied by interviews of developers along the corridor. Similarly, the effects of the LYNX Blue Line, Charlotte's only operating light rail line, were investigated. Funding mechanisms such as Tax Increment Financing (TIF) and Municipal Service Districts (MSD) and the potential revenue of each were analyzed to see how peer systems utilized them and whether they would be a viable option to use in Charlotte.

Results

Key financing mechanisms used for streetcar projects:

- Small Starts through the Federal Transportation Administration (FTA). Three streetcar systems achieved funding this way: an extension in Portland; new system in Tucson, Arizona; and another new system in Fort Lauderdale, Florida.
- State and Regional Programs. Some states use gas tax and sales taxes to fund capital improvement programs that include streetcars grants.
- Taxes, Parking Revenues, Surcharges. Locally, cities can use funds from surcharges on retail sales, allocations from local General Funds, parking meters, and parking garage revenues.
- Land Value Based. To capture land values and turn it into financing, cities use:
- Tax Increment Financing (TIF). These mechanisms freeze property taxes after operation of the system begins, and divert the additional revenues that are a result of the streetcar directly to the transit service.
- Special Assessment Districts (Local Improvement Districts (LID), Municipal Services Districts). All property owners within the walkable zone of the streetcar corridor are charged an annual fee for having improved access to the transit. The funds then go to pay for system improvements or to pay off the system's construction.
- Development Impact Fee or Service District Charge. Impact fees are charged to new developments that are constructed as a result of the transit investment. However, only the new developments must be impacted (and thus charged the fee); existing development cannot be charged the fee or benefit from the investment, making these difficult to create and execute.
- Joint Development. Not used often with streetcars, this mechanism uses publicly owned land to spur development around the transit stops.
- Private Donations. Private entities including universities, hospitals, and corporate campuses can provide funds for transit lines and are more likely to do so if they are going to benefit significantly from its construction.

Value capture is becoming more popular, particularly as cities believe that it can help to finance the systems. The literature review performed in this study found a range of property value premiums that can be expected with a fixed-route transit line, of which streetcar is just one of many modes. Streetcar, it should be noted, is not widely studied as there are few contemporary streetcar lines in operation in the United States. Property premiums by property type:

- Single Family Residential ranges from 2 percent within 200 feet of a station to 35 percent within 100 feet of a station.
- Condominium ranges from 2 to 18 percent within 2,640 feet of a station.
- Apartment ranges between 0 and 4 percent within 2,640 feet of a station to 45 percent within 1,320 feet of a station.
- Office ranges from 9 percent within 300 feet of a station to 120 percent within 1,320 feet of a station.
- Retail ranges from 1 percent within 500 feet of a station to 167 percent within 200 feet of a station.
- Limited systems found neutral or negative premiums, but two that did include Santa Clara County stations in the East Bay area of San Francisco.
- A study on seven systems found a property premium on housing ranging from 6.4 to over 40 percent.

It should be noted that the property premiums are the same as those in the TCRP 86 report because they were prepared by the same author.

European studies found similar results. In an analysis of 15 systems, 13 saw positive land value premiums. Two saw negative premiums in the immediate station areas due to the noise of the systems.

Case Studies. Findings from the case studies include:

- Funding for the Portland Streetcar system came from a variety of sources, including city parking revenues in the streetcar corridor, LID, and TIF. An analysis of the density and development along the Westside streetcar line showed that between 1997 and 2004 the density of development adjacent to the line went from 34 percent of the allowable floor area ratio (FAR) to 90 percent. Lots within one block of the streetcar contained 19 percent of the existing development in 1997 and in 2004 contained 55 percent of the new development; however, it should be noted that this area of Portland allows higher densities than others.
- Half of the Seattle Streetcar was funded through a LID, with the remainder coming from local, state, and federal sources. Before and after analyses were not conducted in the corridor, but the effect of the LID was documented and showed that the value of properties within the LID Zone was $5.385 billion and after was valued at $5.454 billion. This yielded a 1.3 percent increase in value, assuming the increase would not have happened without the streetcar.
- The Memphis streetcar system provides a longer timeframe to study the property value impacts because it has been in operation since 1993. Comparing appraised values of residential property within a quarter mile of the stops on the Madison Street line between 2002 and 2008 yielded an aggregate increase of 784 percent. To compare, the city overall experienced an increase in value of 24 percent. An important note is that the city experienced a boom in the condo market downtown during the same time. Commercial properties decreased in price along the corridor, while the city as a whole had a 17 percent increase in commercial value. Vacant commercial land that was subsequently developed rose in value by 70 percent whereas it rose by only 15 percent in the rest of the city.
- Charlotte's LYNX blue line opened in 2007 as the first line of the proposed light rail system. There were 65 land sales between 2002 and 2008 including 11 pairs (properties sold and resold in the time frame). These pairs were analyzed to find the land premium associated with the light rail line, and it was found that the value rose from 36 percent to 143 percent for properties with zoning changes, and 5 to 16 percent with no zoning changes. Overall value changes in the city were not reported for the time period, so no comparison is available.

Stakeholder Interviews. Developers, property owners, and real estate brokers were interviewed to get their opinions on the streetcar's potential for economic development. Important conclusions drawn from the Charlotte study include:

- Developers acknowledge the ability of transit to affect values, but warn that it is not solely due to the access to transit.
- Streetcar is critical to redevelopment in the corridor.
- Specific locations can be pinpointed as highly likely to redevelop due to the streetcar.
- TIF and MSD were supported as funding mechanisms by property owners.
- Educational institutions and hospitals opposed LID.

Conclusions

The proposed streetcar corridor in Charlotte has high potential for redevelopment, but there is considerably more capacity than demand. This is because the densities have already been increased along the corridor, and not all existing property owners are willing to redevelop their land to the higher regulations immediately. It is important to note that value premiums are difficult to compare before and after because normally the densities are allowed to increase with the transit system. Due to higher density allowances, land values will rise higher and faster than they potentially would if densities remained the same.

Market forces are specific to each location and will affect the rate at which properties will escalate in value. The residents and businesses on the Columbia Pike corridor are likely to be supportive of the proposed streetcar project because the Northern Virginia region is used to quality public transportation and the region has seen the effects on adjacent properties, both due to Metrorail in the DC metro area and due to peer streetcar systems across the country.

The stakeholder interviews conducted as part of this study are of interest to the Columbia Pike Transit Initiative because the same process will occur as part of the ROI study. The conclusions from the developers, including the willingness to use a TIF or MSD, and the consensus that transit can increase the value of adjacent developments, is encouraging.

Neighborhood Studies

Dover, Kohl, & Partners, et al, Columbia Pike Land Use & Housing Study, Arlington County, May 2011.

Chapters 1, 2, 3, 4, and 5, and Appendices A, B, C, D, and E

http://www.arlingtonva.us/departments/CPHD/forums/columbia/Col_Pike_Housing_Study_Background_Info.aspx

Summary

The purpose of the study was to identify tools, policies, and initiatives that could be used to encourage future change along the Columbia Pike corridor and to achieve the community's goals, specifically in connection with multifamily residential areas. The study notes that the Columbia Pike Streetcar will make living and working along the corridor more attractive so it is necessary to have the right tools and policies in place to ensure that the existing community can remain in the area and experience the benefits associated with these changes. The summaries below are organized by chapters and appendices, as applicable. Chapters and appendices that were not directly related to the Columbia Pike Transit Initiative Return on Investment Study are not included.

Methodology

Chapter 1: Background

To help establish that the desired goals and objectives for the corridor are feasible, the study undertook a preliminary analysis of prototypical sites along the corridor. This analysis looked at topography, street and pedestrian access, availability of and access to green spaces, as well as market conditions to get an understanding of the types of improvements necessary to make the corridor more connected. The study also conducted interviews with Columbia Pike property owners and regional developers to gain a better understanding of the existing market conditions.

Chapter 3: Economic Analysis

This chapter provides a financial analysis of the potential redevelopment of various prototypical housing sites to help determine the potential to maintain the corridor's current housing affordability and diversity. The financial model evaluated redevelopment of existing units as well as infill redevelopment by comparing the costs of development to the future income from rents or sales. The analysis made several assumptions about the future conditions of the Columbia Pike corridor, including that the streetcar was in operation. These data assumptions are available in *Appendix B*.

Chapter 4: Analysis of Representative Sites

This chapter looked at four residential sites along the Columbia Pike corridor to determine how policies could help the corridor reach its economic goals through redevelopment while still maintaining the stock of affordable housing. Variables tested for the sites include density, height, parking ratios, and building type. The four variables were found to affect the feasibility to maintain affordable housing and were described in Chapter 3. The original analysis was conducted in January of 2011 for nine sites, but settled on four. Analyses of the five other sites are included in *Appendix C*. The communities analyzed included:

- Greenbrier Apartments
- Dorchester Towers
- Westmont Gardens
- Magnolia Commons

Each of the four residential developments was analyzed iteratively to determine to what degree redevelopment will affect the subsidy gap per affordable unit.

The goal of the hypothetical redevelopment of four residential complexes was to determine how well each site could meet the goals of the *Land Use and Housing Study* and retain 100 percent of the current market rate affordable units.

Because many factors can affect the economic vitality of a site, the Prototype Model was created and analyzed. The Prototype Model aimed for a hypothetical redevelopment to result in a 5-story building with a density of 70 units per acre and a mix of unit sizes ranging from 488 to 1,255 square feet. Parking was to be provided as surface or in an above-ground structure with one dedicated space per unit.

Chapter 5: Preliminary Implementation Concepts

Almost half of the affordable units along Columbia Pike are provided by family-owned complexes that have indicated their desire to maintain these units as affordable in the long-term. Included in this chapter are a list of federal, state, county, and other funding sources and mechanisms that can be used to encourage affordability

along the corridor. Similarly, a list of possible incentives for affordable housing units is shown. An exhaustive list of the potential tools and how appropriate or achievable they would be in Arlington is included in *Appendix D*.

Results

Chapter 1: Background

Without public intervention, the study concludes that the number of affordable housing units available in the corridor could shrink considerably, which will force current occupants to move out of Arlington, spend even more of their limited income on housing, or consolidate their households with households of family or friends. The interviews confirmed this assertion by finding that real estate trusts are pursuing investments aggressively and driving up the costs in the corridor; aging infrastructure along the corridor increases redevelopment costs; and certain design guidelines and standards in the corridor actually limit the inclusion of more affordable housing developments. Data tables containing demographics, housing units, sales, and other market conditions for the corridor are provided in *Appendix A*.

Chapter 3: Economic Analysis

The analysis found that the redevelopment of existing garden units is one of the more financially feasible development opportunities, and therefore, is also one of the larger threats to the ability of the corridor to maintain affordable housing. Another large threat to affordable housing is the development of for-sale townhouses through the demolition of existing garden apartments, which generates greater returns than any of the rental scenarios examined. As a result, strategies and policies will have to be developed to help shape these redevelopment opportunities to include affordable housing components.

The results also indicated that high-rise and mid-rise residential developments (greater than 6 stories) are not feasible under current and generally anticipated market conditions. Future conditions may change as rents increase or new technologies are developed that make mid-rise and high-rise construction more affordable. The study also found that redevelopment under current conditions was only possible when the new construction replaced the existing units by three to one for low-rise developments (less than 6 stories) – assuming below ground parking is not required.

Chapter 4: Analysis of Representative Sites

Key findings for the redevelopments of the four sites included:

- Financial ability to increase density is constrained by the value of the existing units;
- Replacing surface parking with structured parking imposes significant costs that inhibit the provision of affordable housing and scale of development;
- Mid-rise buildings have higher costs and demands for structured parking;
- Rents along the Pike do not support construction costs of mid- or high-rise complexes or their associated parking;
- Height is not the cure, at least not in the near term;
- Unrealistic in today's market to replace a mid-rise complex;
- Increasing density creates value, even through infill; and
- Value is created in townhouse ownership versus renting townhomes.

The economic findings of redesigning the Westmont Gardens complex to these new standards resulted in a reduction of the required subsidy for renovating affordable units from $70,000 to $15,000 per unit, assuming the 9 percent Low-Income Housing Tax Credits.

The result of redeveloping the Magnolia Commons community in a similar fashion was the required subsidy fell from $64,000 per affordable unit to $19,000 per unit, with further reductions possible due to tax credits for renovation of historic existing units.

Chapter 5: Preliminary Implementation Concepts

Policy recommendations include:

- Providing incentives to property owners to maintain their affordable units through that require little government involvement;
- Consider removing the development of townhomes by-right;
- Increase density regulations for residential zones, if the complex maintains a specified percentage of affordable housing units;
- Increased density regulations can help reduce the amount of subsidy needed for redevelopment and inclusion of affordable housing;
- Expedite the approval and permit process for affordable housing units;

- 0.7 parking spaces per unit is sufficient, the 1.0 space per unit standard would negatively impact costs. The model found that adjusting from 1.0 to 0.7 spaces per unit saved $8,000 in subsidies per unit.
- Eliminate the barrier for ADUs, because they can provide affordable housing options.

Conclusions

Chapter 1: Background

This chapter contains valuable information and data on current affordable housing units, analysis of demographic data from 2010 Census, and a summary of the current market conditions in the Columbia Pike corridor.

Chapter 3: Economic Analysis

This chapter indicates that redevelopment of housing along the corridor is likely to remain low-rise (less than 6 stories). However, as rents increase and the area becomes more desirable due to the streetscape, streetcar, and other improvements, affordable housing could be at risk unless measures are taken to encourage the inclusion of affordable housing units with redevelopment opportunities.

Chapter 4: Analysis of Representative Sites

This chapter demonstrates that affordability and higher densities are possible along Columbia Pike. Important policies to maintain affordable housing include low-cost multi-family mortgage revenue bonds issued by the Virginia Housing Development Authority (VHDA), Low-Income Housing Tax Credits (LIHTCs) at 9 percent, and funding from the Affordable Housing Incentive Fund (AHIF).

Chapter 5: Preliminary Implementation Concepts

Significant redevelopment is unlikely under current zoning regulations along Columbia Pike. Completely demolishing and replacing structures is only feasible if higher densities were allowed, so it is more likely that the existing structures will be renovated. Zoning changes will be essential, and developers will need to utilize subsidies to ensure affordable housing remains a priority.

Dover, Kohl, & Partners, et al, Columbia Pike Neighborhoods Plan: Policy Framework, Arlington County, October 14, 2011.
http://www.arlingtonva.us/departments/CPHD/forums/columbia/pdf/cplu&h_draft_policy_framework.pdf

Summary

The *Columbia Pike Neighborhoods Plan Policy Framework* draft was written in October 2011 to help guide the neighborhood development along Columbia Pike in Arlington, Virginia. The goals included encouraging healthy, diverse communities; stabilizing the existing neighborhoods while encouraging economic growth and mixed-use centers; expanding housing options that preserve affordability; providing a safe pedestrian-friendly multimodal corridor; preserving character and history; enhancing urban design; and incorporating sustainable and efficient designs. The Policy Framework provides a set of directives taking into account existing conditions and community input, which will be the basis of the *Neighborhoods Plan*. The *Neighborhoods Plan* aims to prescribe the development and redevelopment between the five revitalization district nodes along Columbia Pike.

Methodology

The study investigated ways that the county can encourage the types of growth that the community and corridor are seeking. Reducing property taxes for affordable housing units was suggested, but would require state approval, which could take years and ultimately end unsuccessfully. Other incentives to maintain and encourage developers to provide affordable housing were recommended, including increasing the subsidies to building owners who commit to specified levels of market affordable housing. Also suggested was transferring private roads to the county, thereby reducing maintenance costs to the owner. Different forms of tax exemption have been used in various areas of the country with success, and these models could be used in the corridor to ensure developers are subsidized for maintaining their affordable housing units. Affordable Housing Investment Fund (AHIF) loans are available to non-profit developers to purchase housing and maintain at least a portion of it as affordable for 30 years or more.

Results

A Form Based Code was repeatedly suggested to prescribe the sorts of development and the aesthetic form of the recommended development and redevelopments on the corridor. The transportation goals associated with the redevelopment of the corridor are already being incorporated. Development patterns in support of the proposed streetcar are recommended, including converting the corridor properties from auto-oriented to multi-modal through limiting parking in front of buildings and having pedestrian-friendly developments.

Conclusions

To encourage economic development along the corridor, it is recommended that the housing stock is increased along the corridor, concentrating denser units around the streetcar stops. At streetcar stops, limited retail and commercial uses may be used, though the majority of their concentration should be in the commercial centers. The study states that an increase in the residential market on the corridor will directly help attract new businesses, restaurants, entertainment, and services. Ensuring an economically sustainable corridor can be achieved in part by generating sufficient economic value through tax revenues and community benefits. While the document is directly related to the Streetcar Corridor, it offers no finite return on investment information besides recommending that a FBC be utilized to oversee the expected increase in development along Columbia Pike, which would then increase the county's tax base.

Rodgers, Angie, Charting a Way Forward, Preserving Market Rate Affordable Housing in Northern Virginia's Inner Suburbs, Northern Virginia Affordable Housing Alliance, 2011.

http://www.nvaha.org/pdfs/NVAH001PreservStudyWeb.pdf

Summary

The study describes the current state of affordable housing in three Northern Virginia neighborhoods: Columbia Pike, Baileys Crossroads, and Beauregard. Recommendations for how to maintain and attract additional market affordable units (MARKS) in these corridors are explored in the context of the current revitalization plans for each neighborhood. As inner suburbs of the Washington, DC metropolitan area, the corridors traditionally have been home to low-income populations that depend on MARKS. However, due to revitalization plans and new transit initiatives, the three neighborhoods will soon be changing, and these changes threaten the balance of affordable housing in the region. The areas are also victims of poor planning, as they are not well accessed by transit, have limited pedestrian and bicycle facilities, and are lacking commercial investments.

Affordable is defined by the federal standard of households spending no more than 30 percent of their income on their housing costs. The 2010 area median income (AMI) of $103,500 helps to define different levels of affordability.

- Public housing units are for extremely and very-low income households, qualifying as below 30-50 percent of AMI;
- Committed Affordable Units (CAFs) are usually owned by non-profits that guarantee to keep the units affordable for 15 years or more, in exchange for receiving government financing for renovations;
- Market Rate Affordable Units (MARKS) are privately owned units that receive no government financing for renovations. Sixty MARKS are affordable to houses with income below 60 percent of AMI, and 80 MARKS are affordable for households with incomes between 60 and 80 percent of AMI.

Methodology

The existing affordable housing stock in the three locations is under threat of being displaced as redevelopment enters the neighborhoods due to proposed transportation improvements. While many affordable units receive subsidies, the majority of affordable housing currently offered is supplied by private owners without government assistance. These are called MARKS, and there are 11,500 of them currently in the three neighborhoods. The study describes the upcoming challenges and how potential redevelopments will affect the affordable housing market, and in spite of this, how the neighborhoods can most efficiently work towards maintaining it. Because owners of MARKS have no obligation to maintain their units as affordable, they will be more likely to redevelop to make a profit. Using data from the three jurisdictions on the current stock of affordable units, planning documents, and interviews with stakeholders and government officials, the redevelopment plans for the neighborhoods are assessed to determine how each neighborhood can maintain and increase their stock of affordable housing through the anticipated redevelopments.

Results

Arlington and Fairfax are interested in how to redevelop along Columbia Pike and into Baileys Crossroads while still maintaining the things that the residents value: affordable housing and a diverse population. For the purpose of this review, only Columbia Pike and Baileys Crossroads will be summarized, as affordable housing in the Beauregard Corridor does not relate to the Columbia Pike Transit Initiative.

Alexandria – Beauregard Corridor. This corridor is not of interest for this study.

Arlington – Columbia Pike. A largely auto-dependent corridor, Columbia Pike is home to 70,000 people of numerous diverse populations in terms of ethnicity and income. The 2010 median income in the Columbia Pike area was $60,765, which was 28 percent lower than the average for all of Arlington, $84,453. Revitalization and redevelopment of the corridor has been a goal since the 1980's, resulting in:

- Zoning and land use regulations to create the new "Main Street" of South Arlington through the adoption of the FBC in 2003;
- Improving the streetscapes to create a more walkable and transit-accessible community;
- Proposing improved transportation along the corridor through a streetcar, enhanced bus, or Metrorail service; and
- Maintaining and increasing the stock of affordable housing to encourage continued diversity.

The stock of CAFs and MARKS has fluctuated since 2000. As of 2010, there were 9,538 rentals along Columbia Pike, and only 15 percent were at market rate. The remaining 85 percent are affordable – a much higher portion than the average of Arlington, 57 percent. The Columbia Pike Transit Initiative estimates that 6,425 additional market rate units will be added to the corridor by 2040.

There are challenges in the corridor, including:

- New development conforming to the FBC;
- Diminishing capacity of CAFs and MARKS, predicted to be 23 percent fewer by 2040;
- Overcrowding; and
- Lack of funds to assist MARKS owners in maintaining their units or purchasing new MARKS.

Fairfax– Baileys Crossroads. Baileys Crossroads is on the western end of Columbia Pike, and in the eastern corner of Fairfax County. Also auto-dependent, the neighborhood has many of the same challenges as Columbia Pike. The household median income in 2010 was $66,000, while the county median was $104,000. The planning area that contains Baileys Crossroads has a higher percentage of minorities than the county overall, 47 percent compared to 37 percent. The area has begun redevelopment in anticipation of the Columbia Pike Streetcar having two stops nearby. Goals for the area include:

- Redevelop the main strip from a retail center to mixed-use;
- Reconstruct the street network to connect areas better and provide space for all modes;
- Decrease the amount of available surface parking and increase the amount of green space; and
- Plan for additional schools and emergency services to serve the increasing population.

The county has been losing affordable housing similar to Columbia Pike, with 8,000 rental units of affordable housing to 70 percent of AMI available in 2002 being lost by 2010. The county fears it will not be able to keep up with the demand for housing as employment opportunities in the Baileys Crossroads neighborhood increase.

Challenges for the Baileys Crossroads area include:

- Maintaining affordable housing is not an explicit goal in the redevelopment plan, so there are no tools to encourage its preservation;
- Elimination in FY2009 of the Pennies for Housing program that dedicated one cent of the real estate tax to be used for affordable housing;
- 93 percent of the units are 40 years old or more;
- 73 percent are garden style, which is a lower density than would be preferred; and
- Low accessibility to public transportation due to the inefficient road networks.

Conclusions

Potential solutions for Columbia Pike to maintain its affordable housing:

- Existing tools
- Affordable Dwelling Units Ordinance requires developers to either provide affordable units or contribute funding to others who do;
- Affordable Housing Investment Fund provides low-interest loans to help developers provide affordable housing; and
- Subsidies to support very low-income households.
- Proposed tools
- Mix home owners and renters on the same property;
- Reduce property taxes to reduce costs for MARKS;
- Provide incentives for energy efficiency in units; and
- Provide financing at lower rates than that offered privately.

Potential solutions for Baileys Crossroads to maintain affordable housing:

- Include a provision for rental units within one mile of the plan's boundaries to constitute a percentage of affordable housing;

- Quantify goals for subsidized and non-subsidized affordable housing;
- Set more aggressive targets to meet existing needs;
- Establish a plan and develop tools to achieve the new goals; and
- Consider utilizing the same tools as Alexandria and Arlington to create continuity and provide incentives to developers.

All three of the neighborhoods discussed in this study have experienced a loss of affordable housing units while also expecting an increase in the population that would need them. With the proposed streetcar project along Columbia Pike ending in Baileys Crossroads, the potential redevelopment could increase land values and encourage developers to raise rents, thereby further reducing the affordable housing stock in both neighborhoods. Maintaining existing units and attracting new developments of affordable housing has been difficult because of limited funding and incentives for developers. However, as the neighborhoods redevelop and improve their economic and transportation situations, maintaining the stock of affordable housing should not be neglected.

Recommendations:

- Set aggressive goals of affordable units;
- Be flexible in helping private owners to create or maintain their stock of affordable housing;
- Make affordable housing a priority in the redevelopment plans despite a lack of funding; and
- Collaborate with neighboring jurisdictions to make complimentary regulations and share solutions since the neighborhoods are experiencing similar problems.

RK&K Engineers, Baileys Crossroads Planning Study, Fairfax County, January 2010.

Summary

The study is a summary of the transportation impacts in the Baileys Crossroads area of Fairfax County as a result of the current land use plan and also due to increased land use under the Preferred Land Use Concept. Baileys Crossroads is a mixed-use development area in eastern Fairfax County. The Preferred Land Use Concept assumes a higher density of land use in the study area as opposed to the level of land use that is currently included in the *Fairfax County Comprehensive Plan*. The Preferred Concept assumes roadway network improvements (including adjusting lane dedications and signal timing, as needed) and traffic impact mitigation improvements on top of those that are already approved in the *Comprehensive Plan*. The Preferred Concept has a higher floor area ratio (FAR) resulting in a higher density of development, and incorporates transit-oriented development (TOD) patterns.

The Preferred Land Use Concept assumes 85 percent build-out by 2030, so the analysis years are 2009 and 2030. It also includes the proposed Columbia Pike Streetcar line terminating at the Skyline complex and a Transportation Center on South Jefferson Street, within the Baileys Crossroads planning district. New development in the *Comprehensive Plan* is divided into four areas and Baileys Crossroads is noted as a Community Business Center, indicating it is to be a high-employment area.

Important corridors in the analysis include Leesburg Pike and Columbia Pike. The *Comprehensive Plan* assumes a 0.98 percent per year annual traffic growth rate from the Fairfax County travel demand model. Transit improvements are included for modeling purposes in all of the 2030 scenarios.

Methodology

The study analyzed two land use scenarios: the land use proposed in the *Fairfax County Comprehensive Plan* and the Preferred Land Use Concept. The consultant, RK&K Engineers, used Synchro Version 7 to analyze the traffic operations. The levels of service in the study area were analyzed for five scenarios:

- 2009 existing conditions,
- 2030 background conditions assuming the existing signal timings,
- 2030 background conditions with optimized signal timing,
- 2030 under the Preferred Land Use Concept without congestion mitigation, and
- 2030 under the Preferred Land Use Concept with congestion mitigation.

For this study, a LOS D or better was considered acceptable at intersections along Leesburg Pike. For all others intersections, LOS E or better was acceptable. Under the existing conditions, one intersection operates at an unacceptable LOS. Similarly, under the existing conditions the Leesburg Pike and Columbia Pike routes experience a LOS D or better.

Within the trip generation process for the 2030 Preferred Concept a trip reduction rate of 30 percent was applied due to the TOD-like development. This reduction factor was approved because of the transit improvements that will occur in the study area and the increased connectivity for pedestrians. A reduction of 25 percent was approved for the blocks outside of the TOD core as well.

Results

This study investigated the traffic effects of different development patterns in the Baileys Crossroads area. As such, no costs were estimated, nor were any property premiums mentioned that could be expected with the different development patterns.

The Synchro results for each of the analyzed scenarios are summarized here:

- Existing 2009. One intersection operates at LOS E, and no arterials are operating at an unacceptable LOS.
- 2030 Background with Existing Signal Timing. Two intersections and three arterials operate at an unacceptable LOS.
- 2030 Background with Optimized Signal Timing. Three intersections and one arterial operate at an unacceptable LOS.
- 2030 Preferred Concept with No Mitigation. Six intersections and three arterials operate at an unacceptable LOS.
- 2030 Preferred Concept with Mitigation. All intersections and arterials operate at an acceptable LOS.

Qualities of the Preferred Land Use Concept scenario at 100 percent build-out include:

- 1.1 million square feet of retail space
- 2 million square feet of office space
- 4,600 apartment/condo units
- 200+ townhomes
- 1 community center and arts center
- 1,400 additional AM peak hour trips over the base case, and 4,000 additional PM peak hour trips

Conclusions

As Baileys Crossroads redevelops, either under the plan currently accepted as the *Fairfax County Comprehensive Plan* or the *Preferred Concept Plan*, the future developments will incorporate mixed-uses at higher densities than what is currently in the area. These increased densities will result in higher traffic volumes that will induce lower levels of service both along arterials and at intersections. Improvements to the local road networks will need to be done in preparation for the higher traffic. The proposed Columbia Pike Streetcar line was included in the future scenarios analyzed for the Baileys Crossroads area, and the induced development in the immediate vicinity of the stop along South Jefferson Street is assumed to be the densest, consistent with traditional TODs.

The current conditions show that the Baileys Crossroads area has only one location with an unacceptable LOS, but the conditions in 2030, both with and without signal optimization, have increased traffic due to the new developments and increased densities. The increased levels of development induced by the *Preferred Concept Plan* will increase traffic congestion, resulting in the need for signal modifications and street improvements to ensure that travel speeds and LOS maintain acceptable.

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