

Route 1



Multimodal Alternatives Analysis

APPENDIX D

Land Use and Economic Development Report

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Route 1



Multimodal Alternatives Analysis

ROUTE 1 MULTIMODAL ALTERNATIVES ANALYSIS

LAND USE AND ECONOMIC DEVELOPMENT REPORT

Revised: November 11, 2014

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Overview

The purpose of the land use analysis is to explore a range of land use configurations and densities for the Route 1 corridor and evaluate the role of land use in supporting the multimodal transportation alternatives under consideration. This information contributes to the screening and evaluation of transportation alternatives and informs selection of a Locally Preferred Alternative (LPA). Additionally, Land Use and Economic Development Effectiveness are key criteria for the Federal Transit Administration (FTA) Capital Investment Program (Section 5309) New Starts/Small Starts rating process. In Section 3, this memo provides an initial evaluation of existing land use policies and plans, and presents recommendations for improving a future FTA New Starts/Small Starts funding application.

The study culminates in a recommendation for a program of multimodal transportation investments. The following transit alternatives were evaluated in detail:

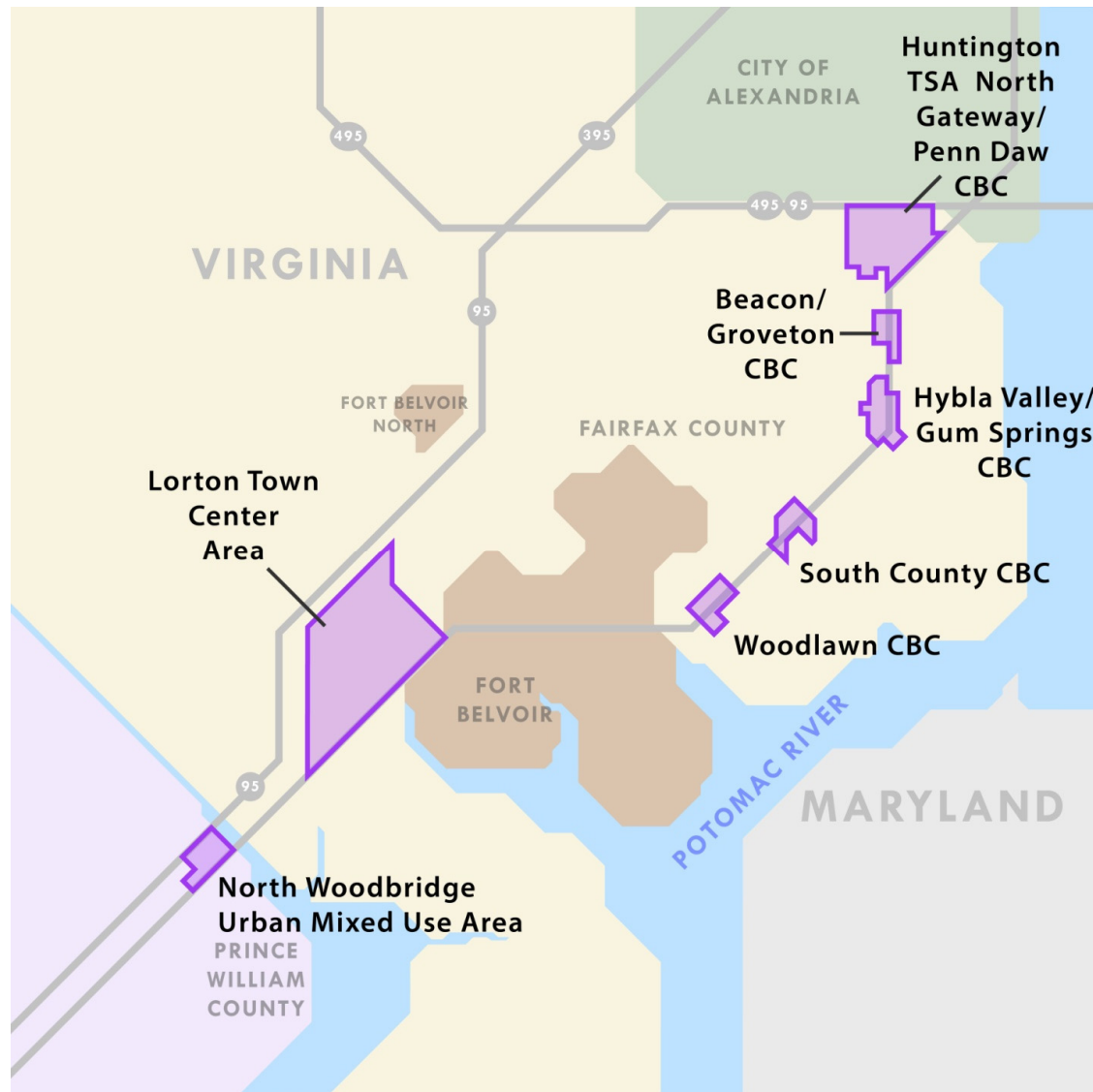
- Curb running bus rapid transit
- Median running bus rapid transit
- Light rail transit
- Bus rapid transit/Metrorail hybrid (Metrorail extension from Huntington to Hybla Valley)

Each alternative includes the following roadway, pedestrian, and bicycle elements:

- Construction of additional travel and turn lanes along portions of Route 1 to achieve a consistent 6-lane cross-section for vehicular traffic
- Continuous sidewalks and multi-use path along Route 1 to accommodate pedestrians and bicyclists (note: implementation and special treatments will vary along the corridor)
- Signals and infrastructure to improve pedestrian crossings of Route 1

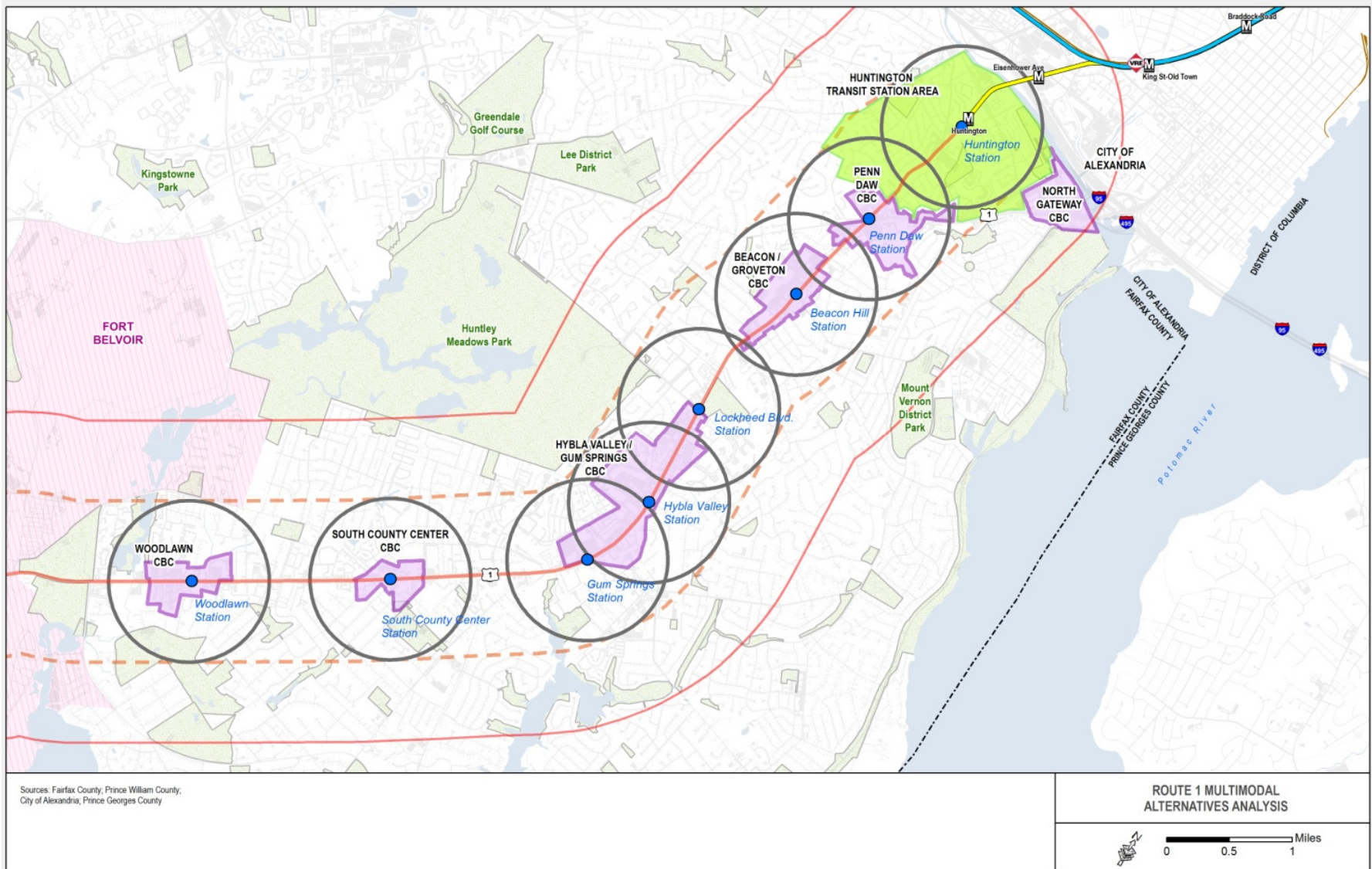
The regional strategy for directing growth is the Activity Centers concept, advanced by the Region Forward Coalition and member organizations, including the Metropolitan Washington Council of Governments (MWCOC). Activity Centers are focal areas for population density and employment, and are the cornerstone of a linked land use-transportation concept for directing strategic growth and investment across the region. The Regional Activity Centers within the study area include Huntington/Penn Daw, Beacon/Groveton, Hybla Valley/Gum Springs, Fort Belvoir, and North Woodbridge. Fairfax and Prince William Counties use a very similar concept in their Comprehensive Plans, which generally correspond with the Activity Centers defined by the Region Forward Coalition. These are described as Community Business Centers in the Fairfax Comprehensive Plan and as Urban Mixed Use Areas in the Prince William Comprehensive Plan. In addition, Fairfax County has defined a Lorton-South Route 1 Suburban Town Center within the larger Lorton South Route 1 Suburban Center. (see **Overview Figure 1**).

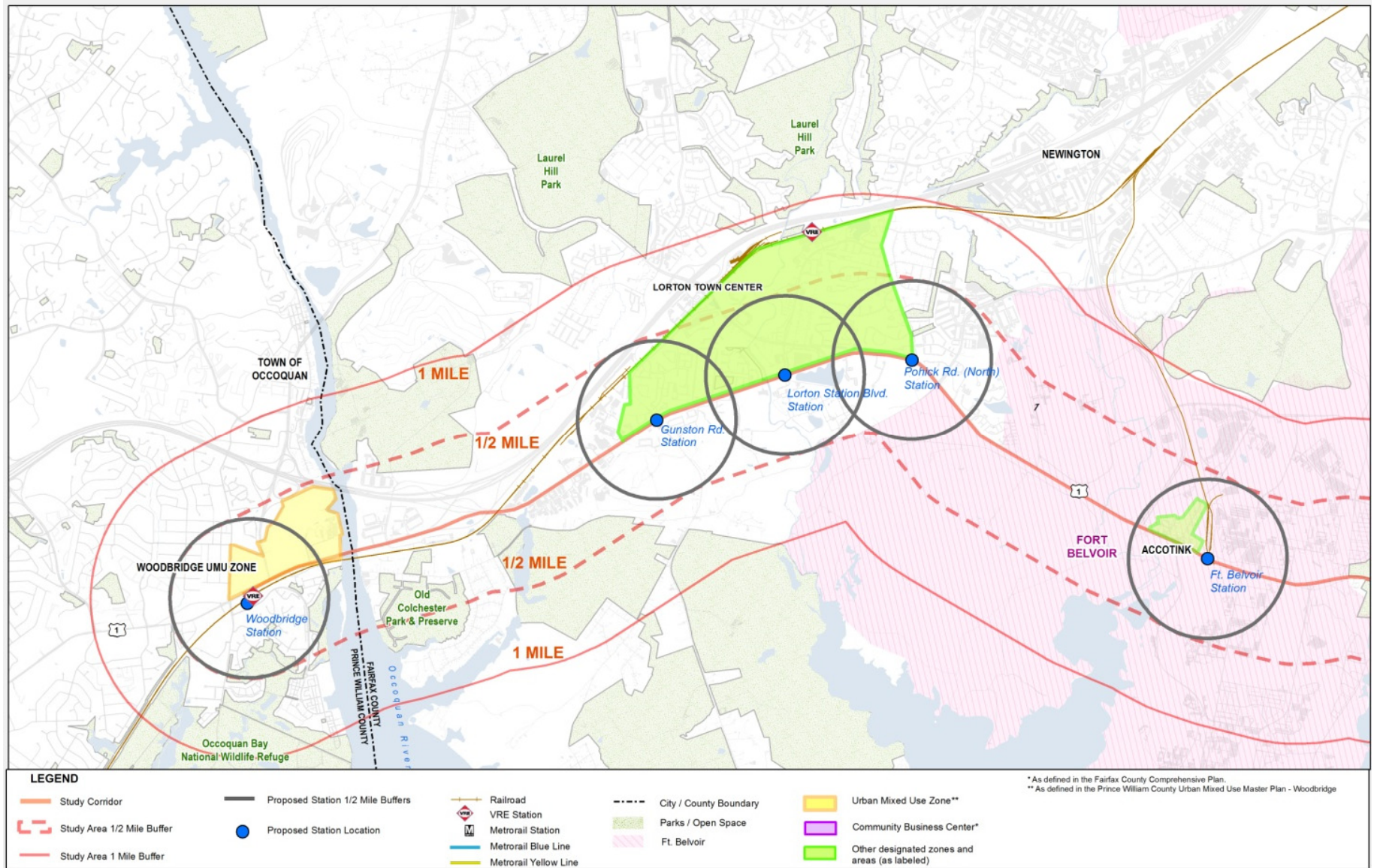
Overview Figure 1: Community Business Centers, Lorton Town Center, and Urban Mixed Use Area



This study has defined thirteen potential transit stations on the Route 1 corridor, which apply to all of the multimodal alternatives. The station locations are shown, along with the CBC, UMU, and other key land use designations, in **Overview Figure 2**. The half-mile radius around each station refers to the area used for the land use analysis. The half mile radius was used because it represents a typical walking distance for transit riders, and therefore a generally appropriate location for transit-oriented development. It is also the area of analysis for many of the FTA criteria relating to land use and economic development.

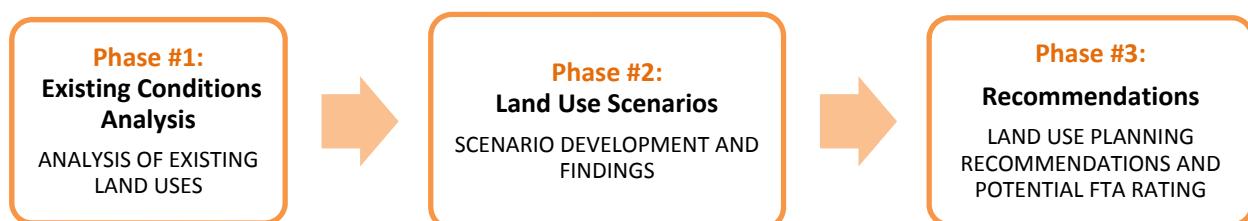
Overview Figure 2: Huntington Transit Station Area, Community Business Centers, Lorton Town Center, Woodbridge Urban Mixed Use Area, and Proposed Station Locations





The land use analysis has been carried out in three phases as shown in **Overview Figure 3**. Phase #1 examines corridor-wide conditions pertaining to land use, development conditions, and accommodation for growth. Data tables for various land use factors are provided as a means to compare proposed station areas in terms of transit-supportive potential. The proposed station areas include one Metrorail station (Huntington), five Fairfax Community Business Centers (Penn Daw, Beacon, Hybla Valley, South County & Woodlawn), two additional Fairfax Activity Centers (Fort Belvoir and Pohick/Lorton/Gunston Road in the Lorton Suburban Center) and one Urban Mixed Use Area in Prince William County (Woodbridge).

Overview Figure 3: Flow Chart for Land Use Evaluation



Phase #2 examines the extent and type of development needed to achieve the goals and objectives for the multimodal transportation alternatives under study. Factors under consideration include the development densities, desired mix of uses, and contributing street network and pedestrian and bicycle connectivity. Three land use scenarios have been developed, reflecting different land use scenarios, as a way to understand the types of multimodal alternatives that can potentially be supported on the corridor. Scenario One is the land use development that can be expected under forecasted population and employment growth, using MWCOC 8.2 forecast models for 2035.¹ Scenarios Two and Three use different land use mixes, reflecting increased growth assumptions and development densities for the purpose of demonstrating the economic, transit ridership, and livability impacts of selected multimodal alternatives. (The economic impacts of Scenarios Two and Three are discussed in Chapter 4 of this memo.)

Phase #2 also describes the three land use scenarios developed and evaluates the proposed station areas under each scenario using the Multimodal Center Types as defined in the Department of Rail and Public Transportation (DRPT) *Multimodal System Design Guidelines*.² These Multimodal Center Types provide an indication of the transit options that can likely be supported based on the development densities illustrated in each of the scenarios. Overview Table 1 presents a table from the DRPT

¹Metropolitan Washington Council of Governments, 2013.

²Virginia Department of Rail & Public Transportation (DRPT). *Multimodal System Design Guidelines, Final Report October, 2013*.

Multimodal System Design Guidelines that relates activity density to specific transit modes, and defines the associated Multimodal Center Type.

Overview Table 1: Multimodal Center Types and Corresponding Transit Investment

	Multimodal Center Type	Activity Density (Jobs + People/ Acre)	Supported Transit Investment
P-6	Urban Core	70.0 or more	LRT/Rail
P-5	Urban Center	33.75 to 70.0	BRT/LRT
P-4	Large Town or Suburban Center	13.75 to 33.75	Express Bus
P-3	Medium Town or Suburban Center	6.63 to 13.75	Fixed Route Bus
P-2	Small Town or Suburban Center	2.13 to 6.63	Demand Response
P-1	Rural or Village Center	2.13 or less	Demand Response
SP	Special Purpose Center	Varies	Varies

Source: DRPT Multimodal System Design Guidelines, 2013

Phase #3 focuses on recommendations for promoting transit-oriented development around the proposed station locations. This includes urban design concepts and land use plans for three specific locations on the corridor – Beacon Groveton (Beacon Hill), Hybla Valley and Woodbridge. These urban design concepts highlight the key elements for creating transit supportive communities and are illustrated with graphics that include land use plans, connectivity diagrams, and massing models that correspond to the three land use scenarios described in Phase #2.

Phase #3 also provides an assessment of transit-supportive development prospects under current land use and zoning policies, with reference to FTA New Starts/Small Starts Land Use and Economic Development criteria. This includes recommendations for how project sponsors may improve Land Use and Economic Development ratings under the FTA New Starts/Small Starts project justification criteria.

Many of the land use analyses for this study emphasize the half mile radius around each proposed station. The intent is to focus on the area that will most likely support transit-oriented, mixed-use development at a walkable distance. However, as the counties progress with specific small area plans for each station, these station area boundaries will be refined to reflect the specific needs and realities of that neighborhood. For example, the Fairfax Comprehensive Plan shows a boundary for the Huntington Metro Station Area that is larger than a half mile radius around the station, while the Beacon Groveton and Hybla Valley CBC's are smaller than this radius. The small areas for the CBC's are intended to focus commercial and mixed use development while protecting established neighborhoods.

1.0 Land Use Analysis

To determine the most appropriate strategy for transitioning the Route 1 corridor from its current land use configurations to a form that can better support transit service, it is critical to first understand the existing patterns of development. This process includes identifying the key features that should be maintained and protected, as well as the elements that can change over time in order to promote transit use, and pedestrian and bicycle activity.

The following section will examine existing land use conditions with regard to how these inform the alternatives analysis process.

1.1 Existing Land Use Conditions

The land use analysis for this study includes a detailed review of land use conditions, plans, and policies in Fairfax and Prince William Counties as they relate to the Route 1 corridor. This analysis includes:

- Existing land use character
- Historic resources
- Environmental constraints
- Population and employment (current and future)
- Other key demographic data (current and future)
- Land use policies and plans (including allowable density, mix of uses, etc.)
- Zoning
- Affordable housing policies

Sections describing existing land use character, historic resources and environmental constraints can be found in **Appendices D1-D11**. The sections included below provide a baseline of conditions that will be pertinent to a future FTA Capital Investment Program (“New Starts”) funding application.

1.1.1 Population and Employment Centers

The population and employment figures for the Route 1 corridor, defined as the number of persons living or working within a half-mile of the Route 1 roadway centerline, was obtained through county and MWCOC demographic data. Boundaries of the Community Business Centers in Fairfax County and the Urban Mixed Use Area in Prince William County, as shown on the maps, are the basis for the Activity Center boundaries used for scenario development in Phases #2 and #3. See **Appendix D8, Population & Employment Per Acre - 2010 Map**.

Under scenario development, the Activity Centers have been further refined as station areas, which are inclusive of the current Community Business Centers, Lorton area and Fort Belvoir in Fairfax County and the Urban Mixed Use Area in Prince William County. In terms of future TOD development, the counties will need to make substantial efforts to increase density and jobs within the corridor and around station areas in particular, if an FTA funding application is to be successful.

Table 1-1: 2010 Population and Employment by Station Area

(Analysis within half-mile radius of each station)

Proposed Station Area	2010 Population	2010 Employment	2010 Activity Density (population + employment) /acre)
Huntington*	7,714	1,289	17.9
Penn Daw	4,661	2,272	13.8
Beacon Hill	3,736	2,809	13.0
Lockheed Blvd.	7,728	1,802	18.9
Hybla Valley	5,010	2,387	14.7
Gum Springs	6,483	2,306	17.5
South County	5,169	1,399	13.1
Woodlawn	4,508	1,576	12.1
Fort Belvoir	539	2,794	6.6
Pohick Rd. (North)	2,479	1,181	7.3
Lorton Station Blvd.	3,462	609	8.1
Gunston Road	2,752	981	7.4
Woodbridge**	2,793	1,632	9.1

Source: MWCOG 8.2 Land Use

*Existing Metrorail Station

**Existing Virginia Railway Express (VRE) Station

1.1.2 Existing development by station area

The Comprehensive Plans for Fairfax and Prince William Counties have detailed descriptions of existing and future land uses along the Route 1 corridor. The Fairfax County Comprehensive Plan describes current and intended future land uses for each Community Business Center (CBC) and the Lorton area. Mixed-use development, with street frontage retail and mid-to-high-rise residential above, is the preferred development type for the CBC areas. The Huntington Transit Station Area and Community Business Centers of North Gateway, Penn Daw, and Beacon Groveton, and the Fort Belvoir/Accotink area all have mixed-use developments on the ground or plans for these in the approvals stage, as of spring 2014.

Huntington: The core of this area is the Huntington Metro station, serving approximately 9,000 transit patrons on a typical weekday. Huntington is developing at higher densities than the surrounding area, with rezoning up to an intensity of 3.0 floor area ratio (FAR) for a recent mixed-use project.

Penn Daw: This proposed station is located at the Penn Daw CBC. Located less than a mile from the Huntington Metro station, the Penn Dawn CBC (totaling 112 acres) is transitioning from a highway-oriented retail area to a hub of urban mixed-use activity. New mixed-use developments are planned, as a response to the 2012 Penn Daw Comprehensive Plan Amendment which permits denser development in this CBC.

Beacon Hill: This proposed station is located at the Beacon Groveton CBC, which is at one of the highest points in the D.C metropolitan area, with views of Alexandria, Tysons Corner and the Washington Monument. Beacon Mall, home to several national retailers, is sited at the former Beacon Airfield site. The 290 unit mixed-use Beacon of Groveton development opened in summer 2012 and represents the first urban scale mixed-use development built on Route 1.

Lockheed/Hybla Valley/Gum Springs: These three proposed station locations are located in the Hybla Valley/Gum Springs CBC. Mount Vernon Plaza is the focal point of this large (239 acres) CBC. This recently renovated shopping center provides over 560,000 square feet of retail space and includes large national retailers. Surrounding the Mount Vernon Plaza are areas of retail, dining, and service businesses. Costco opened adjacent to Mount Vernon Plaza in 2013. Gum Springs, a historic black community of mainly single family houses with some affordable multi-family housing, is at the southern end of this CBC on the east side of Richmond Highway. Hybla Valley/Gum Springs has the highest percentage of public and affordable housing within the project corridor, an important factor in FTA scoring of New Starts projects.

South County: This proposed station is located at the South County CBC. The central feature of this area is the South County Center, a human service center operated by Fairfax County government. Active residential neighborhoods surround this area, and about 500 new residential units are planned between the intersections of Buckman Road and Janna Lee Avenue. The area is connected to residential neighborhoods to the east via Mount Vernon Memorial Highway (Route 235).

Woodlawn: This proposed station is located at the Woodlawn CBC. The Woodlawn CBC abuts Fort Belvoir and is expected to absorb some new residential development related to the Base Realignment and Closure (BRAC) activity at the base. The intersection of Richmond Highway and Mount Vernon Memorial Highway is the gateway to many historical attractions such as Woodlawn Plantation, George Washington's Mount Vernon Estate and Grist Mill, and Frank Lloyd Wright's Pope-Leighey House.

Fort Belvoir: This proposed station is located at Fort Belvoir, near the Accotink Village. Under the currently implemented BRAC plan, Fort Belvoir is transitioning from a traditional military base to an employment center expected to provide 48,000 jobs to the region³. The centerpiece of the BRAC development, Fort Belvoir Community Hospital, was completed in 2012, providing 3,100 jobs. As of August 2013, Fort Belvoir housed 26,000 employees and 7,000 residents⁴. The planned National Army Museum will be located two miles south of Woodlawn, within the northern section of Fort Belvoir on the Fairfax County Parkway. Approximately one million visitors are expected annually.⁵ Fort Belvoir's 2014 Real Property Master Plan is expected to be released in June 2014.

³ Draft *Fort Belvoir Real Property Master Plan, Long Range Component*, December 2009. Fort Belvoir New Vision prepared for the U.S. Army Corps of Engineers

⁴ *Fort Belvoir*, Southeast Fairfax Development Corporation website, <http://www.sfdc.org/visit-shop/ft-belvoir/>

⁵ National Museum, United States Army website: <http://thenmusa.org/about-the-museum.php> (accessed 5/16/14)

The Village of Accotink is a historic community of homes and businesses along Backlick Road, completely surrounded by Fort Belvoir. Several sites, including the Accotink United Methodist Church, are protected by the county. A 283-unit mixed use development is planned for this area.

Pohick Road (North)/ Lorton Station Blvd/Gunston Road: These three proposed stations are located in the Lorton area. According to the Fairfax Comprehensive Plan, Lorton is planned as a Suburban Center rather than as a CBC. The Lorton Town Center lies between Interstate 95 and Route 1, with an Amtrak/Virginia Railway Express (VRE) rail station, and draws heavy commuter use. Mixed use development exists near the VRE station.

Woodbridge: This proposed station is located in North Woodbridge, adjacent to the existing VRE station. The North Woodbridge Urban Mixed Use Zoning Plan envisions the area surrounding Route 1 and Virginia Route 123 as a significant mixed use development, proposed for 3,300 housing units and over one million square feet of office and retail development.⁶ The area is located in Prince William County close to the scenic Occoquan River and is undergoing rapid housing development between Route 1 and the Potomac River.

1.2 Existing and Planned Development

1.2.1 Parcel Analysis

The success of any transit investment depends, to some extent, on the development pattern around the stations. A high-quality transit investment, such as bus rapid transit, light rail, or Metrorail, will benefit from pedestrian-oriented, mixed-use development on adjacent parcels. An analysis of parcel sizes by station area was performed as part of assessing readiness for potential mixed-use developments. Although there is no one particular parcel size for infill mixed-use development, a desirable size to accommodate strong street access and sufficient area for buildings, internal alleys and open space would be four to five acres or more. Within the Route 1 corridor, few parcels are greater than five acres, the exceptions being shopping centers such as Beacon Mall and Mt. Vernon Plaza. The implication for future land use is that extensive parcel consolidation will likely be necessary to develop significant mixed use projects associated with some of the transit stations. **Table 1-2** presents the parcel sizes within half-mile radius of each station. A set of maps shows the location of large parcels (over five acres) throughout the corridor and the proximity of these to the designated Community Business Centers or Urban Mixed Use area. See **Appendix D-11, Parcel Acreage Map**.

⁶ *Urban Mixed Use Master Zoning Plan for North Woodbridge, 2005.*

Table 1-2: Parcel Sizes by Station

(analysis of all parcels that fall within a half-mile radius of each station)

Station	Total Number of Parcels	Number of Parcels			
		0-0.5 Acres	0.5-5 Acres	5-10 Acres	> 10 Acres
Huntington	3750	2314	1426	6	4
Penn Daw	1375	1257	101	5	12
Beacon Hill	1215	1088	113	5	9
Lockheed Blvd.	938	849	74	7	8
Hybla Valley	1200	1014	170	9	7
Gum Springs	1290	1009	263	10	8
South County	1704	1579	109	11	5
Woodlawn	1556	1324	217	5	10
Fort Belvoir	45	27	16	1	1
Pohick (North)	1131	1036	77	7	11
Lorton Station Blvd.	845	734	93	7	11
Gunston Rd.	1400	1236	66	24	14
Woodbridge	928	801	95	12	20

Source: Fairfax and Prince William County GIS

1.2.2 Approved Mixed-Use Development

As of February 2014, the far north end of the project corridor (within one mile of Huntington Metro Station) is experiencing significant new housing and mixed-use development, with five new housing projects totaling 1,487 housing units currently in the development pipeline.⁷ The rest of the corridor continues to redevelop with primarily low density commercial properties, but mixed-use projects are beginning to be proposed further south as well. **Table 1-3** shows a summary of newly planned or rezoned housing and mixed-use development in the study area. Overall, there is approximately 748 million square feet of existing development in the study corridor.

⁷Status of Projects and Issues, February 2014. Southeast Fairfax Development Corporation.
<http://www.sfdc.org/develop/documents/>

Table 1-3: Approved / Proposed Mixed-Use Development & High Density Housing

Activity Area	Projects	Status as of May 2014	Residential units	Non-residential GSF
Huntington	The Parker at Huntington Station	Zoning approved	360	210,000
	Huntington Biscayne	Zoning approved	141	3,500
	Huntington Club Condominiums	Comprehensive Plan Amendment approved	1,200	727,000
Penn Daw	The Shelby	Zoning approved	240	0
	Penn Daw Plaza	Comprehensive Plan Amendment approved	471	45,000
	The Grande at Huntington	Zoning approved	275	25,000
Beacon/Groveton	Beacon of Groveton Phase II	Zoning approved	0	50,000
Hybla Valley/Gum Springs	No mixed-use development			
South County	Mount Vernon Gateway at Buckman Road	Comprehensive Plan Amendment approved	500	0
Woodlawn	No mixed-use development			
Fort Belvoir Accotink Village	Bainbridge Accotink Village	Zoning proposed	283	24,000
Lorton	No planned or approved mixed-use development			
Woodbridge	No planned or approved mixed-use development			
	Total (pending final plans)		3,470	1,084,500

Source: Southeast Fairfax Development Corporation website, March 2014 and Review by Fairfax DPZ staff

1.2.3 Future Development Conditions Within Corridor as per Adopted County Comprehensive Plan

Although the Route 1 corridor does not have large parcels of land available for development, it is reasonable that a number of currently developed parcels could undergo redevelopment as market demand for housing grows. The Fairfax County Comprehensive Plan anticipates 11.3 million gross square feet (GSF) of non-residential development and 12,300 residential units. In 2014, approximately 5.3 million GSF of non-residential use and 5,000 dwellings exist, not including the Huntington Transit Station Area and the Lorton Suburban Center. Within this smaller portion of the Route 1 corridor, almost 500 new residential units have been approved through the zoning process. The projects are occurring on land previously developed for other uses. **Table 1-3** indicates that around 3,470 new residential units are being proposed for the corridor in the near future, an amount that would achieve about a third of the anticipated new housing for the corridor before 2020.

Through the Urban Mixed Use Master Zoning Plan for North Woodbridge, Prince William County has projected development of 3,300 residential units and 1.03 gross square feet of non-residential development for the area along Route 123, adjacent to southbound Route 1. The projected density is 1.65 FAR at plan build out. See **Appendix D-13, Allowable FAR within half-mile Buffer Map**.

1.3 Review of existing county zoning and land use policies

The majority of the zoning along the Route 1 corridor is commercial, typified by low-density shopping centers fronting on parking lots throughout the north section of the project. South of Fort Belvoir, residential zoning is prevalent, with pockets of commercial land at Lorton and Woodbridge. The area just north of the I-95 interchange near Lorton is primarily industrial and includes a wastewater treatment plant owned and operated by Fairfax County. **Table 1-4** outlines the primary Fairfax and Prince William land use documents that direct future growth and development in the corridor. These documents are used in the land use analysis to understand the current land use conditions and the vision for each segment of the corridor, as defined by the Counties and Fort Belvoir in their plans and studies. **Table 1-4** lists relevant county plans and policies, organized by county, area scale and date. Plans not county-adopted are listed at the end.

The Fairfax County Comprehensive Plan directs growth to specific employment centers – such as Community Business Centers and Suburban Centers - that can potentially become station areas with transit-supportive development densities. Prince William County has created an Urban Mixed Use plan for North Woodbridge that envisions a high-density, mixed use area surrounding the Woodbridge Virginia Railway Express (VRE) station. Housing affordability is addressed in the counties' five-year consolidated housing plans, which call for a percentage of affordable housing for new market-rate development. Both counties are in the process of revisiting their requirements for affordable housing in targeted growth areas.

Policies relating to urban design, street design, parking and multimodal transportation vary throughout the counties and in the study area. The Fairfax County Comprehensive Plan provides guidance pertaining to streetscape, parking, landscape, and the scale and siting of new buildings for the area extending south of I-495 to Fort Belvoir. Policies relating to multimodal transportation should be developed if one of the alternatives is adopted by the Board of Supervisors. Prince William County has recently developed a set of urban design guidelines for the Route 1 corridor in North Woodbridge, emphasizing building interface, street connectivity and a vibrant pedestrian community. This policy could be considered a model for developing transit-supportive urban and street guidelines for other station areas.

Table 1-4: Land Use Resources

Document	Year	Summary	Key Finding/Relevant Recommendations
Fairfax County Comprehensive Plan AREA IV Mount Vernon Planning District, 2013 edition with amendments 2014 (Section for MV1 Huntington Community Planning Sector) Fairfax County VA	2014	Identifies land use conditions for Huntington Transit Development Area	Maximum gross square feet of development, number of dwelling units and building height limits specified for Huntington Transit Development Area. Parking reductions & bicycle amenities and other transportation demand management techniques can be used to achieve traffic mitigation requirements.
Fairfax County Comprehensive Plan - AREA IV Mount Vernon Planning District, 2013 edition with amendments 2014 (Sections for Planning Sectors MV2-MV8) Fairfax County VA	2014	Guiding document for county future land use and transportation.	Envisions six Community Business Centers (CBC) along the Rt 1 Corridor: North Gateway, Penn Daw, Beacon/Groveton, Hybla Valley/Gum Springs, South County Center and Woodlawn.
Fairfax County Comprehensive Plan - AREA IV Lower Potomac Planning District, 2013 edition with amendments 2014 Fairfax County VA	2014	Lower Potomac District extends from Fort Belvoir/Lorton to PW County line.	Transportation objectives identical to Mount Vernon, including widening of Rt. 1 between PW County line & Fort Belvoir.
Fairfax County Zoning Ordinance Part 8 2-800 Affordable Dwelling Unit Program Fairfax County VA	2014	Regulates development location, type and character for county	Provides potential density bonuses up to 20%, based on housing type. ADU requirements range from 6.25% for 4+ story buildings to 12.5% for 3 story or less
Fairfax County Five-Year Consolidated Plan, 2011 – 2015 Fairfax County VA	2011	HUD-required five-year affordable housing plan for Fairfax County, updated annually.	The County's affordable housing ordinance calls for a 5% goal for affordable housing, 12% workforce housing goal within all new development.
Fairfax County Policy Plan 2013 Edition with amendments 2014 Fairfax County VA	2014	Broad statement of policy that gives direction to Area Plans and TOD planning	Emphasizes the need for a balanced transportation system that reduces dependence on the automobile. Also encourages protection of established neighborhoods while strategically promoting efficient patterns of mixed-use development that support an interconnected, multimodal system (transit, sidewalks, trails, bicycle facilities, and roadways).

Document	Year	Summary	Key Finding/Relevant Recommendations
Mount Vernon District Visioning Task Force Fairfax County VA	2010	25 year vision for District with recommendations for Richmond Highway, focus on Smart Growth guiding principles	Desire for livable corridor articulated, with entertainment, cultural destinations, walkability along Rt 1 and nearby streets.
Prince William County 2008 Comprehensive Plan – Land Use Component Prince William County, VA	2008	County plan for land use, economic growth, livability & transportation, updated at five-year intervals	Concentrate growth in town centers / TOD with supportive mixed use zoning, density bonuses, and lower parking requirements. Includes the North Woodbridge Urban Mixed use Master Plan (with additions since 2005).
Potomac Communities Design Guidelines Prince William County, VA	2014	Proposes design guidelines for buildings, sites, streets and landscape for projects in the Route 1 Corridor of Prince William County	Establishes standards for urban development in North Woodbridge / Route 1, promoting pedestrian environment and vibrant mixed use.
Prince William County Housing Affordability Market Analysis, December 2012 Prince William County, VA	2012	An analysis of affordable housing needs in the County.	Significant need for housing for families at or below 30% AMI (Area Median Income). Need for work force rental units for families 30% AMI-120% AMI.
Prince William County Strategic Plan, 2004-2008 Prince William County, VA	2012	An adopted plan to meet the goals and principles of guiding future growth of the county.	Implement the Urban Mixed Use Master Zoning Plan in north Woodbridge. Implement Streetscape and Utility Plan for Route 1.
Prince William County Redevelopment Overlay – Woodbridge Prince William County, VA	2011	Redevelopment overlay districts are established by the Board of County Supervisors to encourage economic redevelopment of lands in proximity to major thoroughfares.	Route 1 corridor through Woodbridge is within Redevelopment Overlay; parcels eligible for financial incentives to redevelop in manner consistent with Comprehensive Plan.
Urban Mixed Use Zoning Master Plan – North Woodbridge Prince William County, VA	Dec. 2005	Provides a mixed use land use strategy for the redevelopment of 164 acres of land along Route One, across from the VRE Station at Woodbridge.	Proposes medium-high density residential and office uses.

Document	Year	Summary	Key Finding/Relevant Recommendations
Fort Belvoir Real Property Master Plan, Long Range Component Department of Defense, US Army Corps of Engineers	2010	Master plan addressing proposed land use changes as a result of 2005 Base Realignment and Closure (BRAC)	Assumes 48,000 total employment by 2030 concentrated on several base activity centers. Transit connectivity to region is a key goal.
Urban Land Institute Study of Richmond Highway Corridor	2005	Study intent was to develop strategies to revitalize the corridor and determine potential for commercial office market	Development along Richmond Hwy should be focused on CBCs and activity nodes. Called for increased FAR in key locations.

1.4 Amount of Approved Affordable Housing Within Corridor

The Route 1 corridor contains a significant amount of affordable housing directed at low-to-moderate and moderate-to-middle income residents. In 2009 there were approximately 10,045 legally binding affordability-restricted housing units in Fairfax County; of these, 2149 or 21percent are located in the Route 1 corridor study area.⁸ The Mount Vernon Planning District and the Route 1 corridor have much higher percentages of publicly assisted housing than the county as a whole.⁹

Each new development in Fairfax County is encouraged to provide at least 12 percent affordable and/or workforce housing. **Table 1-5** provides a list of the affordable housing units within the Route 1 study corridor. This is an initial list demonstrating the large number of affordable housing units on the Route 1 corridor; however it will require further research and updates prior to an FTA application. The existing affordable housing units are shown on a map in **Appendix A.12, Existing Affordable Housing map**.

⁸ *Housing Fundamentals: How Affordable Housing is provided in Fairfax County*. Board of Supervisors Housing Committee, Powerpoint presentation, June 2009.

Correspondence with Fairfax County Department of Housing and Community Development, September 2013.

⁹ *Fairfax County Comprehensive Plan 2013 edition, amended through 1-28-2014* - Area IV Mount Vernon Planning District, Richmond Highway Corridor Area.

Table 1-5: Legally Binding Affordability Restricted Housing in the Route 1 Corridor¹⁰

Nearby Activity Center	Housing	Type	Number of Affordable Units	Legally Binding	Meets 60% AMI ¹¹ criteria
Penn Daw	Pen Daw Plaza (approved, unbuilt)	Affordable Dwelling Unit	21	yes	yes
Beacon – Groveton	The Atrium	FCHRA owned rental housing	37	yes	yes
Beacon – Groveton	Tavenner Lane	FCHRA owned rental housing	24	yes	yes
Beacon – Groveton	Lafayette Apartments (aka Groveton Gardens)	Low Income Housing Tax Credit	340	yes	yes
Beacon – Groveton	Woodley Hills Estates	Manufactured Housing	115	yes	yes
Hybla Valley	Audubon Apartments	Public Housing	46	yes	yes
Hybla Valley	West Ford I	Public Housing	24	yes	yes
Hybla Valley	West Ford II	Public Housing	22	yes	yes
Hybla Valley	West Ford III	Public Housing	59	yes	yes
Hybla Valley	Murrygate Village	FCHRA owned rental housing	198	yes	yes
Hybla Valley	Gum Springs Glen	FCHRA owned rental housing	60	yes	yes
Hybla Valley	Colchester Towne	Public Housing	8	yes	yes
		FCHRA owned rental housing	24		
Hybla Valley	Spring Gardens	Federally assisted rental units	207	yes	yes
Hybla Valley	Hunting Creek Townhomes	LIHTC/Federally assisted rental	35	yes	yes
Hybla Valley	Stony Brook Apartments	LIHTC/Federally assisted rental	204	yes	yes
Hybla Valley	Mount Vernon House	FCHRA owned rental housing	130	yes	yes
Hybla Valley	Janna Lee I & II	LIHTC/Federally assisted rental	300	yes	yes
South County	Old Mill Gardens	Public Housing	48	yes	yes
Lorton	Armistead I & II	Low Income Housing (LIHTC)	248	yes	yes
Woodbridge	None planned at this time				

Source: Fairfax County Comprehensive Plan, Prince William County Office of Housing & Community Development (as of September 2013)

¹⁰ Table last updated May 2014 with proffers information obtained from Fairfax County Zoning Approvals¹¹ Area Median Income (AMI) is the midpoint in the family-income range for a metropolitan statistical area or for the non-metro parts of a state. The figure often is used as a basis to stratify incomes into low, moderate and upper ranges. (Source: Freddie Mac, 2013)

2.0 Land Use Scenarios

Three land use scenarios were developed as part of the Route 1 Multimodal Alternatives Analysis. These scenarios are intended to demonstrate the relationships between population and employment growth, multimodal transportation demand, economic development, and high quality public investments. In this way, the land use scenarios inform the evaluation of multimodal transportation alternatives.

The three land use scenarios represent a range of potential development scales. The approach for each scenario is described below:

Scenario One: The Scenario One land use analysis is based on the 2035 Metropolitan Washington Council of Governments (MWCOC) version 8.2 projections for the half-mile radius around each proposed station location. 2035 Traffic Analysis Zone (TAZ) data were used to analyze the population and employment currently projected for the station locations. Scenario One represents “current trends for growth” under the 2035 population and employment projections, with a concentration of population and employment within the half-mile station core area.

For this and subsequent scenarios, the principles outlined in the Fairfax County Comprehensive Plan’s Guidelines for Transit-Oriented Development are used as a framework for proposing station area plans to support a transit investment. This includes establishing a street grid, defining appropriate building massing and frontage, providing a mix of uses, creating plaza and park spaces, and designing pedestrian-oriented streetscapes around the station areas.

Scenario Two: The Scenario Two land use analysis reflects a “reasonable increment of growth” above the 2035 MWCOC projections. The “reasonable increment of growth” is assumed to result from:

- (1) New development that can be attributed to a high quality transit investment, and
- (2) New development that can be attributed to a change in county policies that promotes transit-oriented development.

The growth increment for each station area has been estimated to range from 15 to 25 percent, depending on the station location, and input provided by Fairfax and Prince William County staff members. The percentages are further informed by national experience with transit-oriented development and associated policies. For this scenario, population and employment is concentrated within the half-mile station core, at greater densities than Scenario One.

Scenario Three: The Scenario Three land use analysis reflects the amount of population and employment needed to achieve development densities typically associated with:

- Metrorail stations at the Huntington, Beacon Hill, and Hybla Valley locations, and
- BRT stations at all other station locations on the corridor.

These population and employment thresholds were determined using the DRPT Multimodal System Design Guidelines, and analysis of existing Metrorail station area development patterns in the DC region and BRT/LRT stations in the Commonwealth. Population and employment is concentrated within the

half-mile core, but may also be distributed locally as needed to achieve the requisite activity density for Metrorail.

2.1 Scenario One

The Scenario One land use analysis is based on the 2035 MWCOG (version 8.2) projections for the half-mile radius around each proposed station location. 2035 TAZ data were used to analyze the population and employment currently projected for the station locations.

Table 2-1 presents the 2010 MWCOG and 2035 MWCOG projections by station. In some cases, the stations are clustered for the analysis because there was significant overlap of the half-mile radii around each station. Table 2.1 also presents the anticipated activity density and associated Multimodal Center Type for each station and station cluster. The activity density calculation is a way to standardize and compare the various station areas. Activity density is calculated by adding together population and employment, then dividing by the station area acreage. Multimodal Center Type is a concept for understanding the relationship between activity density and corresponding level of transit investment. Generally higher development densities can support higher levels of transit investments. **Table 2-2** presents a table from the *DRPT Multimodal System Design Guidelines* that relates activity density to specific transit modes, and defines the Multimodal Center Types. The activity levels are based on a sampling of several hundred communities in Virginia, grouped within ranges that support different types of transit.

Table 2-1: MWCOG 2010 and Scenario One (MWCOG 2035) Analysis

Station or Station Cluster	Acreage	2010 Pop + Emp	2010 Activity Density	Multimodal Center Type (MWCOG 2010)	2035 Pop + Emp (Scenario One)	2035 Activity Density (Scenario One)	Multimodal Center Type (Scenario One)
Huntington, Penn Daw, Beacon Hill	1,340	19,686	14.7	P-4	34,926	26.1	P-4
Lockheed Blvd, Hybla Valley, Gum Springs	1,209	20,320	16.8	P-4	24,433	20.2	P-4
South County	503	6,569	13.1	P-3	9,276	18.4	P-4
Woodlawn	503	6,084	12.1	P-3	8,388	16.7	P-4
Fort Belvoir	503	3,333	6.6	P-3	4,425	8.8	P-3
Pohick Rd. (North), Lorton Station Blvd., Gunston Rd.	1,426	10,797	7.6	P-3	15,803	11.1	P-3
Woodbridge	503	4,569	9.1	P-3	11,646	23.2	P-4
Total	5,987	71,356			108,897		
Average		10,194	11	P-3	15,557	18	P-4

Notes:

- 2010 and 2035 Data Source: MWCOG 8.2 Forecast
- All data analyzed within half-mile of the station/station cluster locations

- Activity Density = (Population + Employment)/Acre
- Source for Multimodal Center Type: DRPT Multimodal Design Guidelines, 2013

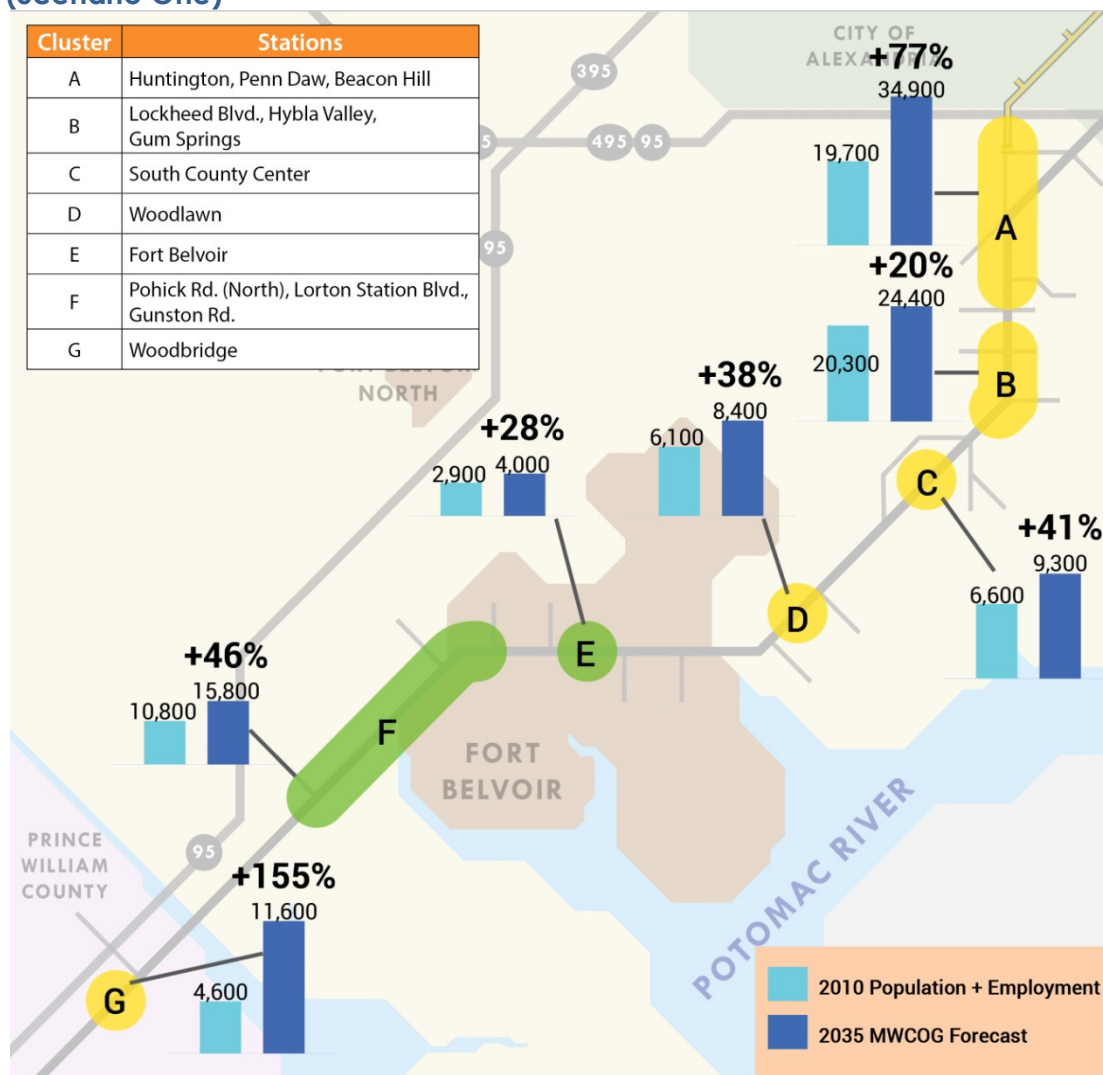
Table 2-2: Multimodal Center Types and Corresponding Transit Investment

	Multimodal Center Type	Activity Density (Jobs + People/ Acre)	Supported Transit Investment
P-6	Urban Core	70.0 or more	LRT/Rail
P-5	Urban Center	33.75 to 70.0	BRT/LRT
P-4	Large Town or Suburban Center	13.75 to 33.75	Express Bus
P-3	Medium Town or Suburban Center	6.63 to 13.75	Fixed Route Bus
P-2	Small Town or Suburban Center	2.13 to 6.63	Demand Response
P-1	Rural or Village Center	2.13 or less	Demand Response
SP	Special Purpose Center	Varies	Varies

Source: DRPT Multimodal System Design Guidelines, 2013

Figure 2-1 presents Scenario One (MWCOG 2035 projections), the growth percentage from 2010 to 2035, and the Scenario One Multimodal Center Types by station and station cluster. The northern portion of the corridor (north of Fort Belvoir) and the southern end of the corridor (Woodbridge) have growth projections consistent with the large town/suburban center (P-4) Multimodal Center Type. This level of development is generally associated with an express bus type transit service. The middle segment of the corridor (Fort Belvoir and Lorton areas) has development expectations consistent with the medium town/suburban center (P-3) Multimodal Center Type. This level of development is generally associated with a fixed route bus type transit service.

Figure 2-1: MWCOG Projections by Station and Station Cluster: 2010 and 2035 (Scenario One)



Supported Transit Technologies by Multimodal Center Type

Multimodal Center Intensity		
Center Type	Activity Density (Jobs + people/acre)	Typical Supported Transit Technology
● P-6 Urban Core	70.0 or more	LRT/Rail
● P-5 Urban Center	33.75 to 70.0	BRT/LRT
● P-4 Large Town or Suburban Center	13.75 to 33.75	Express Bus
● P-3 Medium Town or Suburban Center	6.63 to 13.75	Fixed Route Bus

Source for Multimodal Center Types: DRPT Multimodal System Design Guidelines, 2013

2.2 Scenario Two

The Scenario Two land use analysis reflects a “reasonable increment of growth” above the 2035 MWCOG projections. The “reasonable increment of growth” is assumed to result from:

- (1) New development that can be attributed to a high quality transit investment, and
- (2) New development that can be attributed to a change in county policies that promotes transit-oriented development.

This growth increment for each station area ranges from 15 to 25 percent, depending on the station location, and input provided by Fairfax and Prince William County staff members. The percentages are informed by national experience with transit-oriented development and associated policies.

Table 2-3 presents Scenario One (MWCOG 2035) and Scenario Two population and employment by station and station cluster. It also presents the percentage increase applied to each station (Scenario One to Scenario Two), the activity density for each station, and the associated Multimodal Center Type.

Table 2-3: Scenario One and Scenario Two Analysis

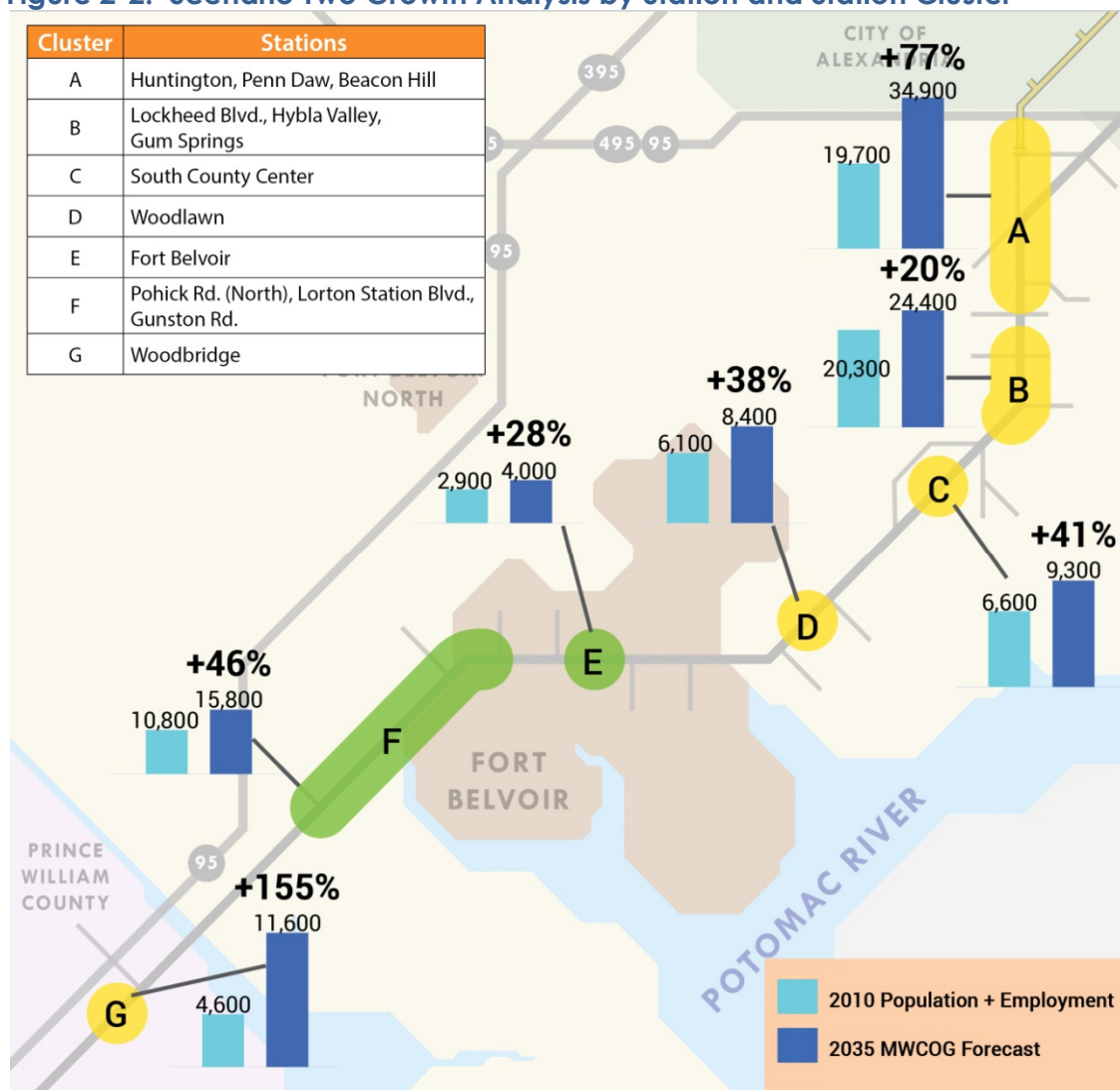
Station or Station Cluster	Acre-age	2035 Pop + Emp (Scenario One)	2035 Activity Density (Scenario One)	Multi-modal Center Type (Scenario One)	Percent Increase Sc. 1 to Sc. 2	Scenario Two Pop + Emp	Scenario Two Activity Density	Multi-modal Center Type (Scenario Two)
Huntington, Penn Daw, Beacon Hill	1,340	34,926	26.1	P-4	25%	43,658	32.6	P-4
Lockheed Blvd, Hybla Valley, Gum Springs	1,209	24,433	20.2	P-4	25%	30,541	25.3	P-4
South County	503	9,276	18.4	P-4	15%	10,667	21.2	P-4
Woodlawn	503	8,388	16.7	P-4	15%	9,646	19.2	P-4
Fort Belvoir	503	4,425	8.8	P-3	15%	5,088	10.1	P-3
Pohick Rd. (North), Lorton Station Blvd., Gunston Rd.	1426	15,803	11.1	P-3	15%	18,174	12.7	P-3
Woodbridge	503	11,646	23.2	P-4	25%	14,558	28.9	P-4
Total	5,987	108,897				132,332		
Average		15,557	18	P-4		18,905	21.4	P-4

Notes:

- 2035 Data Source: MWCOG 8.2 Forecast
- All data analyzed within half-mile of the station/station cluster locations
- Activity Density = (Population + Employment)/Acre
- Source for Multimodal Center Type: DRPT Multimodal Design Guidelines, 2013

Figure 2-2 presents Scenario Two, the growth percentage increase from 2010 to Scenario Two, and the Scenario Two Multimodal Center Types by station and station cluster. The northern-most segment of the corridor (Huntington to Beacon Hill) and the southern end of the corridor (Woodbridge) have Scenario Two growth consistent with the large town/suburban center Multimodal Center Type (P-4), approaching the urban core Multimodal Center Type (P-5). This level of development is generally associated with express bus and BRT/LRT type transit services. The middle segment of the corridor south of Beacon Hill (Lockheed Blvd. to Woodlawn) has Scenario Two growth also consistent with the large town/suburban center (P-4) Multimodal Center Type. This level of development is generally associated with express bus type transit service. The Fort Belvoir and Lorton areas have Scenario Two growth consistent with the medium town/suburban center (P-3) Multimodal Center Type. This level of development is generally associated with a fixed route bus type transit service.

Figure 2-2: Scenario Two Growth Analysis by Station and Station Cluster



Supported Transit Technologies by Multimodal Center Type

Multimodal Center Intensity		
Center Type	Activity Density (Jobs + people/acre)	Typical Supported Transit Technology
● P-6 Urban Core	70.0 or more	LRT/Rail
● P-5 Urban Center	33.75 to 70.0	BRT/LRT
● P-4 Large Town or Suburban Center	13.75 to 33.75	Express Bus
● P-3 Medium Town or Suburban Center	6.63 to 13.75	Fixed Route Bus

Source for Multimodal Center Types: DRPT Multimodal System Design Guidelines, 2013

2.3 Scenario Three

The Scenario Three land use analysis reflects the amount of population and employment needed to achieve Metrorail supportive development densities at the northern station locations (Huntington, Beacon Hill, and Hybla Valley) and BRT supportive development densities at all other station locations on the corridor. This corresponds with transportation Alternative 4. The DRPT Multimodal System Design Guidelines and analysis of existing Metrorail station area development patterns and BRT/LRT stations in the Commonwealth served as the foundation for determining the densities required to support Metrorail and BRT on the corridor. As shown in **Table 2.2**, Metrorail service is generally associated with station area activity densities of 70 or more (jobs + population)/acre. BRT service is generally associated with station area activity densities of 37 or more.

Table 2-4 presents Scenario Two and Scenario Three population and employment by station and station cluster. It also presents the activity density for each station, and the associated Multimodal Center Type.

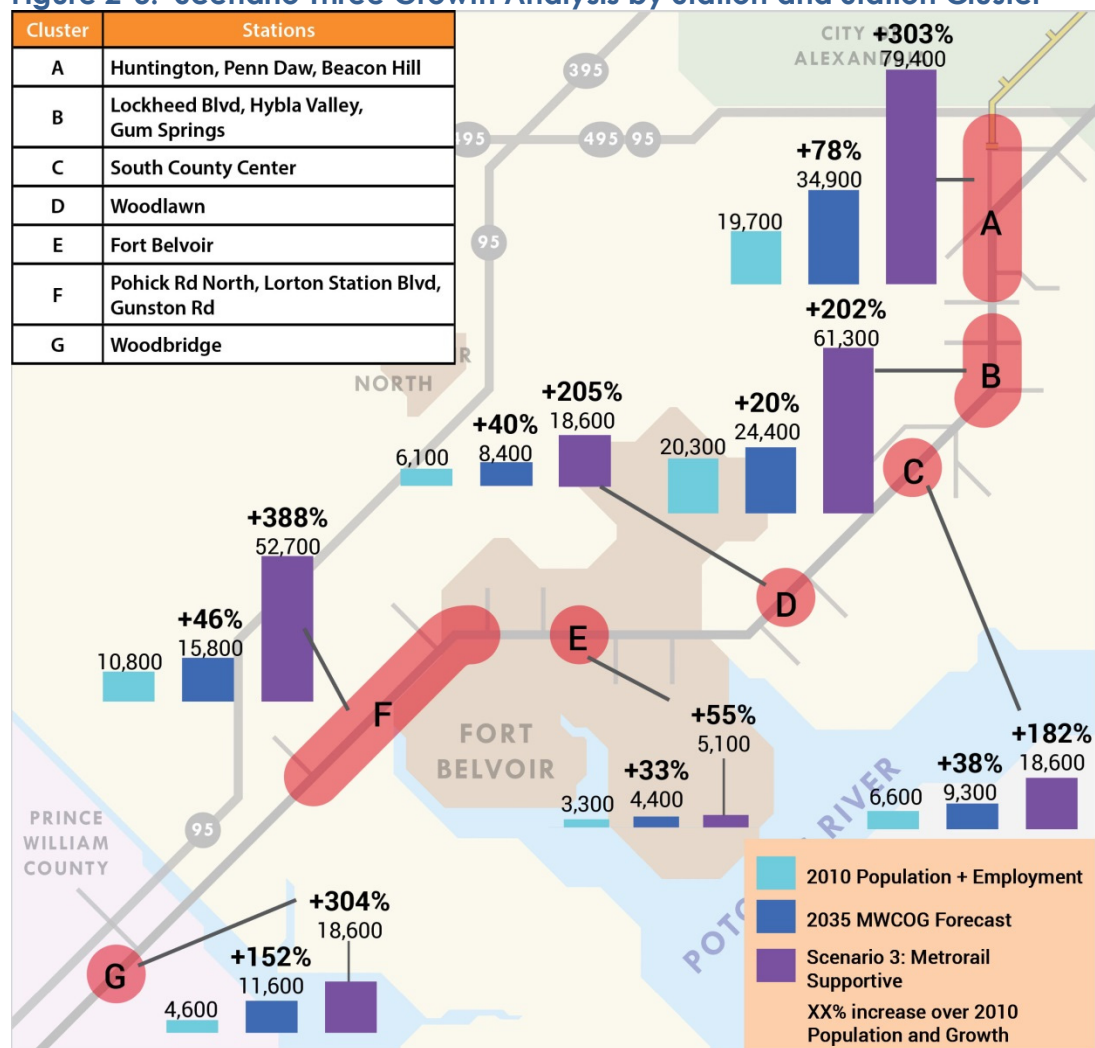
Table 2-4: Scenario Two and Scenario Three Analysis

Station or Station Cluster	Acreage	Scenario Two Pop + Emp	Scenario Two Activity Density	Multimodal Center Type (Scenario Two)	Scenario Three Pop + Emp	Scenario Three Activity Density
Huntington, Penn Daw, Beacon Hill	1.340	43,658	32.6	P-4	79,437	70.0 at Huntington and Beacon Hill; 37.0 at Penn Daw
Lockheed Blvd, Hybla Valley, Gum Springs	1.209	30,541	25.3	P-4	61,332	70.0 at Hybla Valley; 37.0 at Lockheed and Gum Springs
South County	503	10,667	21.2	P-4	18,611	37.0
Woodlawn	503	9,646	19.2	P-4	18,611	37.0
Fort Belvoir	503	5,088	10.1	P-3	5,088	10.1
Pohick Rd. (North), Lorton Station Blvd., Gunston Rd.	1426	18,174	12.7	P-3	52,749	37.0
Woodbridge	503	14,558	28.9	P-4	18,611	37.0
Total	5,987	132,332			267,963	
Average		18,905	21.4	P-4	38,280	

Notes:

- All data analyzed within half-mile of the station/station cluster locations
- Activity Density = (Population + Employment)/Acre
- Source for Multimodal Center Type: DRPT Multimodal Design Guidelines, 2013

Figure 2-3 presents Scenario Three, the growth percentage increase from 2010 to Scenario One, and the growth increase from 2010 to Scenario Three. The Scenario Three Multimodal Center Types all show the same activity density level (P-6). This development density is typically supportive of a Metrorail investment.

Figure 2-3: Scenario Three Growth Analysis by Station and Station Cluster**Supported Transit Technologies by Multimodal Center Type**

Multimodal Center Intensity		
Center Type	Activity Density (Jobs + people/acre)	Typical Supported Transit Technology
● P-6 Urban Core	70.0 or more	LRT/Rail
● P-5 Urban Center	33.75 to 70.0	BRT/LRT
● P-4 Large Town or Suburban Center	13.75 to 33.75	Express Bus
● P-3 Medium Town or Suburban Center	6.63 to 13.75	Fixed Route Bus

Source for Multimodal Center Types: DRPT Multimodal System Design Guidelines, 2013

3.0 Land Use Recommendations

Section Three provides recommendations for land use planning on the Route 1 corridor in three ways:

1. Presentation of transit-oriented urban design concepts for three station locations.
2. Evaluation of current land uses using quantitative measures.
3. Evaluation of county land use planning policies using qualitative and quantitative measures.

The Fairfax County Comprehensive Plan offers a useful framework for evaluating station area plans for their ability to support transit-oriented development (TOD). These are the “Guidelines for Transit-Oriented Development”¹² and include the following principles:

1. **Transit Proximity and Station Area Boundaries** (focus highest densities around the station)
2. **Station-specific Flexibility** (examine the unique character of particular stations)
3. **Pedestrian and Bicycle Access**
4. **Mix of Land Uses**
5. **Housing Affordability**
6. **Urban Design** (excellence in site planning, streetscape and building design)
7. **Street Design** (grid of safe, attractive, connected streets)
8. **Parking** (encourage use of transit and maximize available parking)
9. **Transportation and Traffic** (promote a balance between TOD intensity and multimodal transportation infrastructure)

In Sections 3.1 through 3.3, the Fairfax County Guidelines for TOD are used (where applicable) to create transit-oriented urban design concepts for three station locations - Beacon Hill Station, Hybla Valley Station Area Cluster (including Lockheed Blvd. Station, Hybla Valley Station, and Gum Springs Station), and the Woodbridge Station. The three locations were selected to represent sites in each county that were also of a sufficient size to demonstrate all three scenarios. The scenarios are intended to depict the components of a strong transit-oriented development (TOD) concept for each station area, and graphically present the differences between the three land use scenarios.

An important note is that the scenario graphics are illustrative, shown here for visualization purposes, and not conceptual station area plans that are being proposed for local adoption. The concepts simply depict examples of potential development patterns that could be used to accommodate the growth assumptions associated with each alternative. Each concept reflects several key principles for transit-oriented development described in the Fairfax County Comprehensive Plan Guidelines for TOD, specifically:

- Transit proximity and higher density development
- Pedestrian-oriented street design with bicycle access
- A vertical mix of uses (housing, jobs, and services)

¹² Fairfax County Comprehensive Plan, 2007 Edition, Policy Plan, Land Use Appendix II, Amended Through 9-22-2008, Page 33.

- Street design and connectivity

The graphics depicting Scenario One and Scenario Two remain within the defined CBC areas in Fairfax County, and generally within the UMU area in Prince William County, based on county direction). However, the Scenario Three massing diagrams extend slightly outside of the CBC areas, recognizing that growth at this scale would likely extend the area for growth. The massing diagrams are conceptual in order to understand the scale of development for the three scenarios. They are not intended as refined plans for development.

Sections 3.4 through 3.6 focus on the criteria used by FTA to evaluate projects for potential funding. Evaluation of current land uses using quantitative measures is presented using land use data summarized by county and corridor. The focus for this assessment is population density, number of households and total employment. For the qualitative assessment, county land use policies are evaluated using criteria under the current FTA ratings system for existing Land Use and Economic Effectiveness. The tables are organized according to the required criteria. Ratings breakpoints, likely ratings, and recommendations for potentially improving the ratings are supplied under each criterion. This documentation can be used as a starting place for an eventual FTA Capital Investment Program application, but does not represent a complete set of submittal documentation.

Section 3.7 discusses current transit projects that are underway in the FTA New Starts/Small Starts funding pipeline, as a basis of comparison for Route 1.

3.1 Beacon Hill Station Area Analysis

The Beacon Hill Station Area is one of three station areas that were studied in further detail for the land use analysis. **Figure 3-1** shows the location of the Beacon Hill Station in relation to the other stations on the corridor. **Table 3-1** summarizes the 2010, Scenario One, Scenario Two, Comprehensive Plan, and Scenario Three numbers for this station area.

Figure 3-1: Beacon Hill Station Location



Table 3-1: Beacon Hill Station Scenarios Summary

	Population + Employment	Activity Density	Multimodal Center Type (and potentially supported transit investment)	FAR (within CBC)	Pop/Jobs Ratio
MWCOG 2010	6,545	13.0	P-3 (Fixed Route Bus)	0.07	6.2
MWCOG 2035 (Scenario One)	13,669	27.2	P-4 (Express Bus)	1.3	4.3
Scenario Two (25% increase on Sc. 1)	17,086	34.0	P-5 (BRT/LRT)	1.9	3.0
Comprehensive Plan	19,413	38.6	P-5 (BRT/LRT)	2.2	3.0
Scenario Three	35,210	70.0	P-6 (LRT/Rail)	3.4	3.0

Notes:

- All data analyzed within half-mile of the station/station cluster locations (except the FAR, which is calculated within the new development area, which is generally the CBC)
- Activity Density = (Population + Employment)/Acre
- Source for Multimodal Center Type and Potentially Supported Transit Investment: DRPT Multimodal Design Guidelines, 2013

- Pop/Jobs Ratio for Scenarios Two and Three are based on the Comprehensive Plan distributions

County Land Use Plan vs. Scenarios

The 2014 County Comprehensive Plan for the Beacon Community Business Center proposes an alternative use with redevelopment for the current Beacon Mall parcel, tied to meeting certain conditions rather than a specific intensity. Remaining parcels fronting Richmond Highway are proposed for mixed office, retail and/or higher density residential. The Beacon Hill scenarios shown in this memo propose mixed-use development for the entire mall parcel and the lots which front on Richmond Highway across from the mall parcel. The Comprehensive Plan allows slightly higher building density in the core area closest to the transit station than is shown in Scenario Two. Densities are similar at the edges of the half-mile area.

Unique Features

This Community Business Center is focused on a potential single station— Beacon Hill Station. The existing street grid offers multiple opportunities to connect to existing neighborhoods on both the east and west sides of Richmond Highway (Route 1). A more refined grid of blocks could be created within the CBC with redevelopment.

Scenario Land Uses

In the proposed land use plan, non-residential uses (office, retail and hotel) are clustered around the station. For the most part, residential uses are shown a minimum of a half block back from Route 1. In the southern part of the Community Business Center, some residential uses are proposed along Route 1, although courtyards at the front of the buildings attempt to create a buffer and some separation from Route 1. All scenarios accommodate both multifamily buildings and townhouses.

Open Space

A large town square is proposed one block west of Beacon Hill Station and is linked to Route 1 via a boulevard with a wide median. The land use plan shows several other open spaces, including both linear and pocket parks, as well as boulevards with wide medians throughout the Community Business Center.

Scenario Comparisons

The target quantities for Scenario Three are such that proposed development is shown beyond the current Community Business Center boundaries. In this instance development might also occur on land west of South Kings Highway.

Figure 3-2 shows existing land use conditions at the potential Beacon Hill Station area.

Figure 3-3 presents conceptual “bird’s eye views” of the potential Beacon Hill Station area, based on Scenario Two and Scenario Three land use densities. It should be noted that this view has been created solely for illustrative purposes, in order to demonstrate examples of how the proposed densities for

these scenarios might be implemented. Scenario Two is similar to the build out assumed under the current Comprehensive Plan.

Figure 3-2: Existing Conditions View of Beacon Hill Area



Figure 3-3: Beacon Hill Station Bird's Eye View, Scenarios Two and Three



Scenario Two Bird's Eye View

**Scenario Three Bird's Eye View**

Figure 3-4 presents a potential illustrative plan for the Beacon Hill Station area, to show the land use pattern, including buildings and open spaces, along with connecting streets in greater detail. **Figure 3-5** is a conceptual land use plan, showing the types of land uses, location and approximate sizes that might surround the potential transit station under a transit-supportive scenario.

Figure 3-4: Beacon Hill Station Illustrative Plan, Scenario Two**BEACON HILL STATION ILLUSTRATIVE PLAN**

Figure 3-5: Beacon Hill Station Land Use Plan, Scenario Two

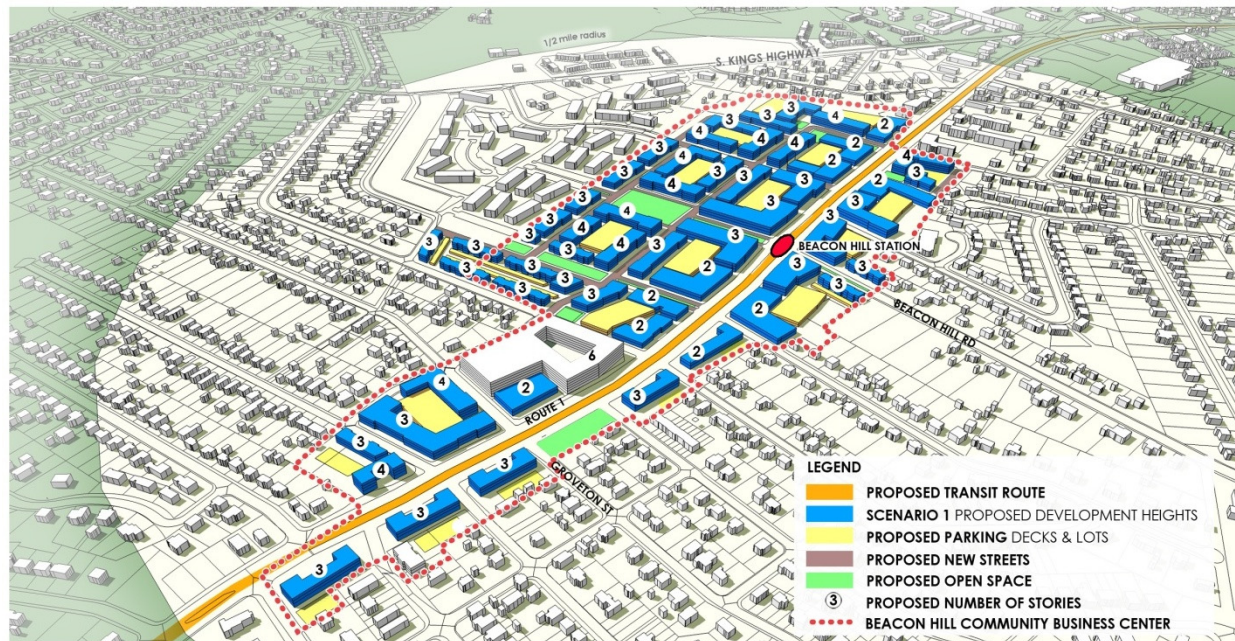


BEACON HILL STATION LAND USE PLAN

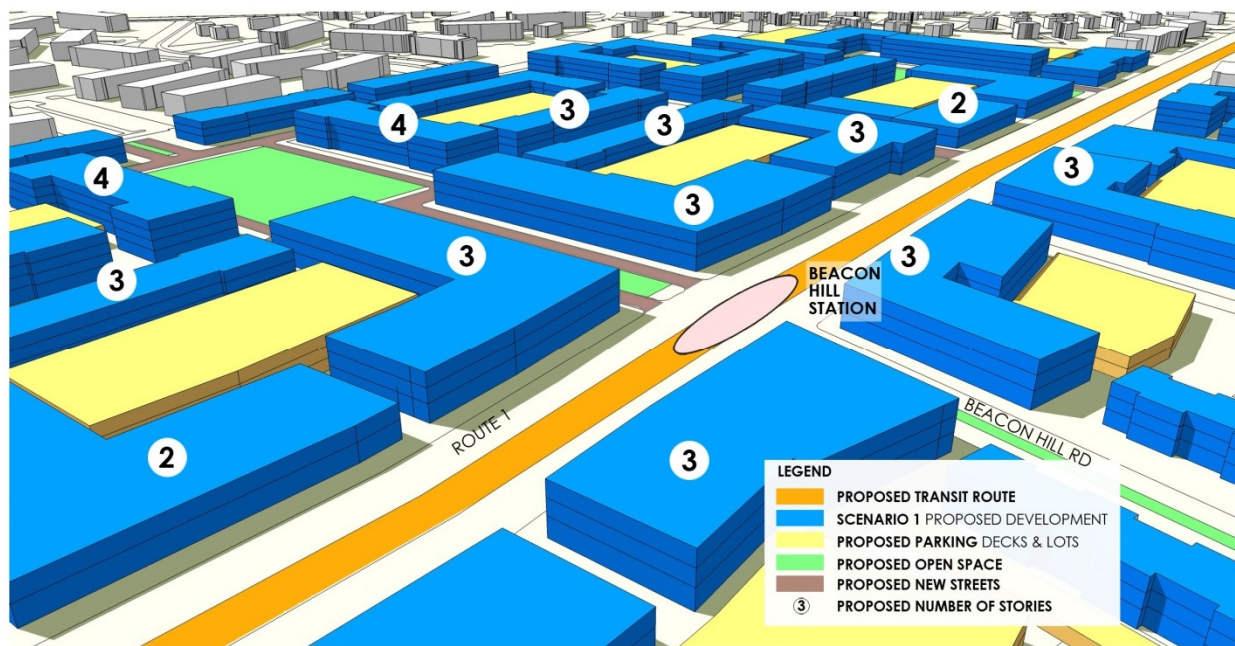
Figure 3-6 (multiple illustrations) demonstrates the potential development massing differences between Scenarios One, Two, and Three at Beacon Hill Station. The massing diagrams also include the amount of potential development based on the Fairfax County Comprehensive Plan as a benchmark for comparison. Several key principles for transit-oriented development are reflected in the land use and urban design plans for Beacon Hill Station:

- Higher density development, with buildings highest near station and stepping back to neighborhoods (Scenarios One and Two)
- A vertical mix of uses, including office, retail and residential
- Street configurations that allow for wide sidewalks, street trees and furniture, and on-street parking, all of which promote pedestrian activity
- Street connectivity internally and to adjacent neighborhoods where possible

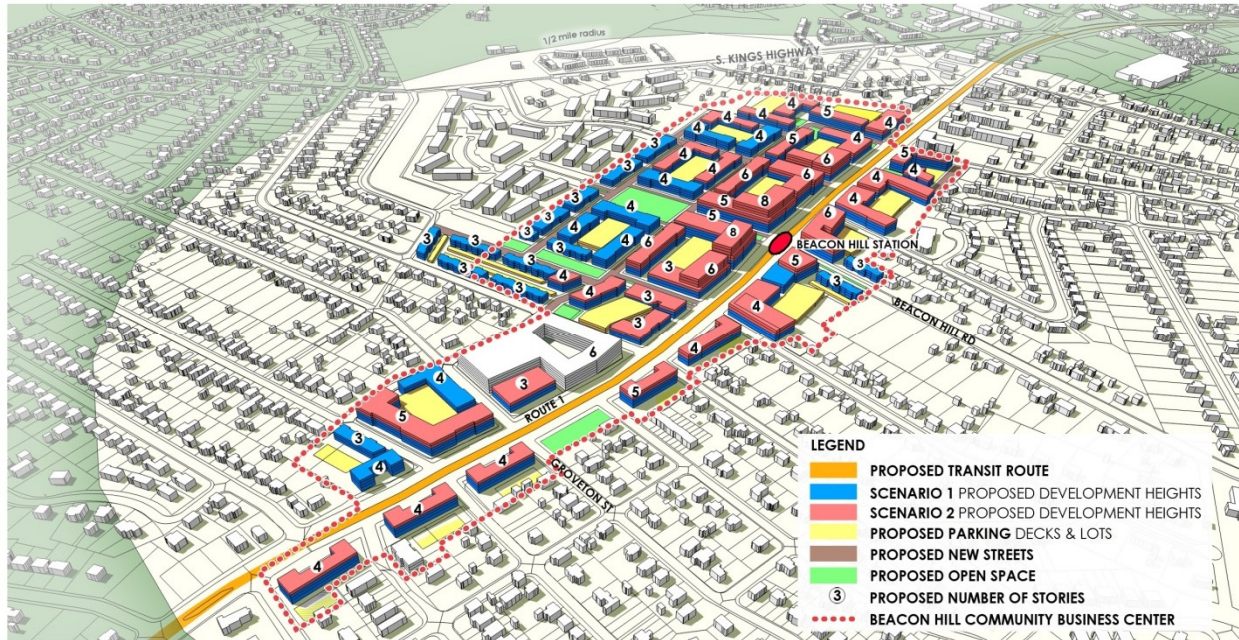
Figure 3-6: Beacon Hill Station Massing Diagrams: Scenarios One and Two, Comprehensive Plan, and Scenario Three



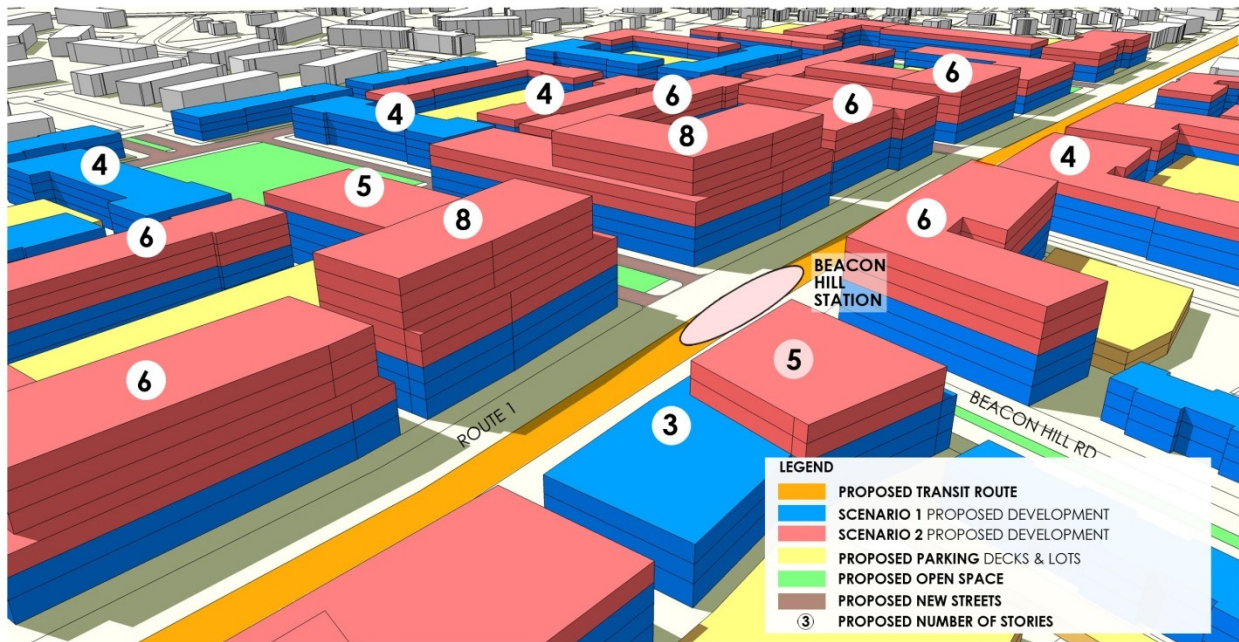
BEACON HILL STATION SCENARIO 1



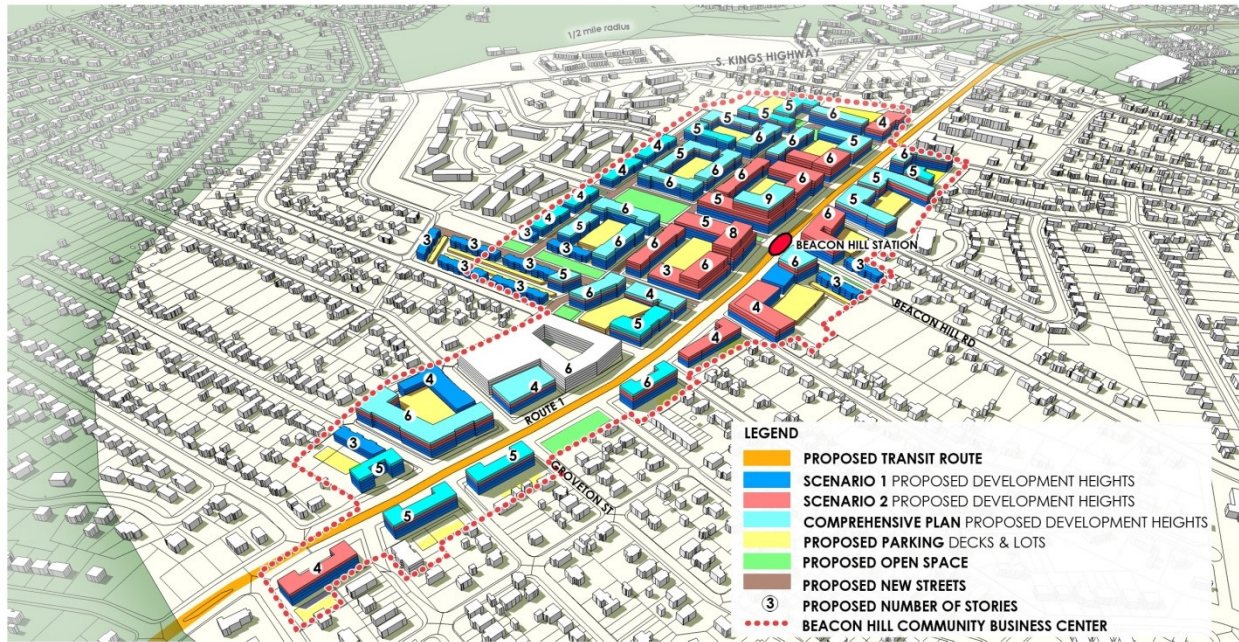
BEACON HILL STATION SCENARIO 1



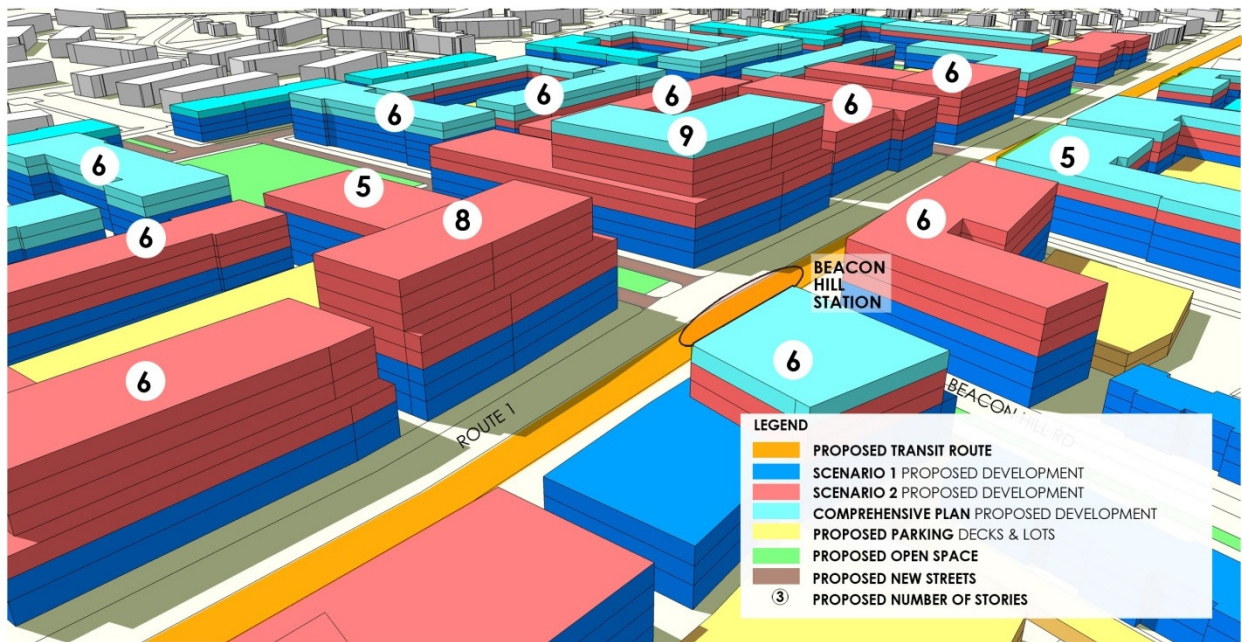
BEACON HILL STATION SCENARIO 2



BEACON HILL STATION SCENARIO 2



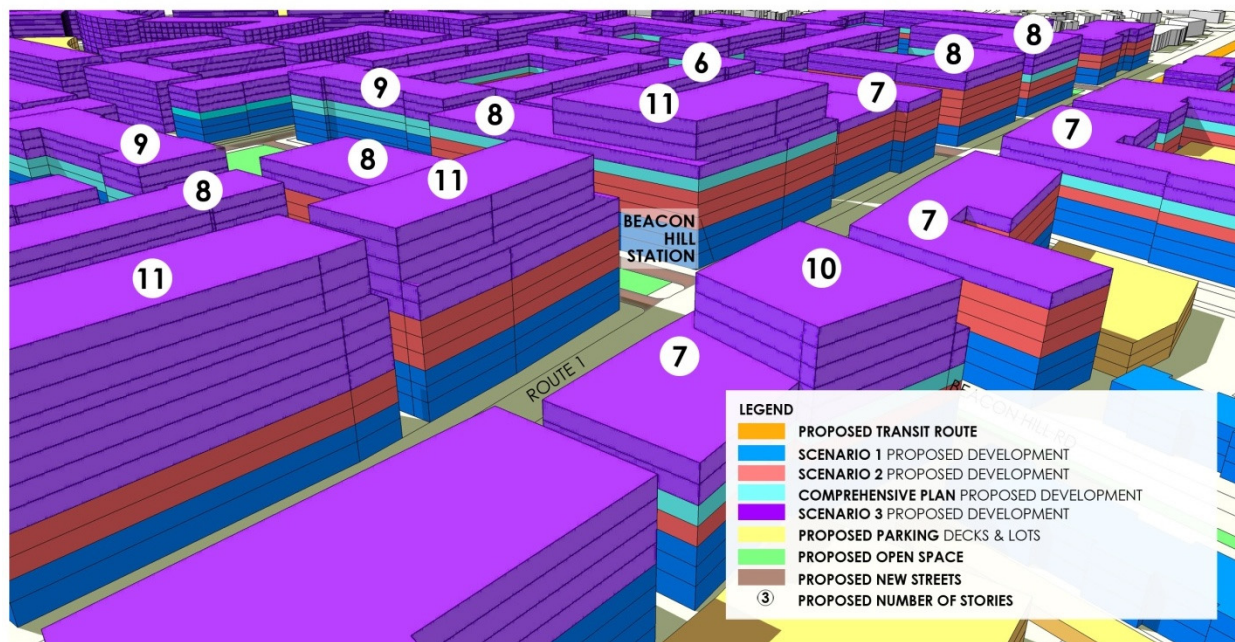
BEACON HILL STATION SCENARIO COMPREHENSIVE PLAN



BEACON HILL STATION SCENARIO COMPREHENSIVE PLAN



BEACON HILL STATION SCENARIO 3



BEACON HILL STATION SCENARIO 3

Figure 3-7 demonstrates the proposed improvements to the street network as shown in the urban design concepts. At the proposed Beacon Hill Station, a new grid of streets is shown on the existing “megablock” that currently supports the Beacon Mall Shopping Center and parking lot. This new grid of streets increases the “nodes” or street intersections from 92 nodes within the half-mile radius to 111 nodes within that same area.

Figure 3-7: Beacon Hill Station Existing and Conceptual Street Network



3.2 Hybla Valley Station Area Analysis

The Hybla Valley Station Area Cluster is the second of three station areas that were studied in further detail for the land use analysis. **Figure 3-8** shows the location of the Hybla Valley Station Area Cluster in relation to the other stations on the corridor. **Table 3-2** summarizes the 2010, Scenario One, Scenario Two, Comprehensive Plan, and Scenario Three numbers for this station area cluster.

Figure 3-8: Hybla Valley Station Cluster Location



Table 3.2: Hybla Valley Station Cluster Scenarios Summary

	Population + Employment	Activity Density	Multimodal Center Type (and Potentially Supported Transit Investment)	FAR (within CBC)	Pop/Jobs Ratio
MWCOG 2010	20,320	16.8	P-4 (Express Bus)	0.15	3.3
MWCOG 2035 (Scenario One)	24,433	20.2	P-4 (Express Bus)	0.6	2.9
Scenario Two (25% increase on Sc. 1)	30,541	25.3	P-4 (Express Bus)	1.4	1.3
Comprehensive Plan	27,324	22.6	P-4 (Express Bus)	1.2	1.3
Scenario Three	84,630	70.0	P-6 (LRT/Rail)	5.2	1.3

Notes:

- All data analyzed within half-mile of the station/station cluster locations (except the FAR, which is calculated within the new development area, which is generally the CBC)
- Activity Density = (Population + Employment)/Acre
- Source for Multimodal Center Type and Potentially Supported Transit Investment: DRPT Multimodal Design Guidelines, 2013
- Pop/Jobs Ratio for Scenarios Two and Three are based on the Comprehensive Plan distributions

County Land Use Plan vs. Scenarios

The Fairfax County Comprehensive Plan anticipates a lower level of development density for Hybla Valley than the Beacon Hill Station Area. For Hybla Valley, the county hopes to achieve active, mixed-use neighborhoods and better pedestrian circulation through development of low- to mid-rise offices, townhomes and street oriented retail. The Scenario Two and Three concepts show density patterns that are generally greater than those anticipated in the Comprehensive Plan, particularly in the mixed-use areas closest to the three transit stations.

Unique Features

The Hybla Valley/Gum Springs Community Business Center includes three proposed stations within its boundaries – Lockheed Boulevard Station, Hybla Valley Station and Gum Springs Station. The CBC boundaries focus future development on the west side of Richmond Highway (Route 1). The Gum Springs Conservation Area is located on the east side of Route 1 and will limit development in this location. Fairfax County is currently considering a Bus Transfer Center on the Route 1 corridor. The Hybla Valley/Gum Springs Community Business Center is one of several possible locations. The land use concepts show a potential location for the bus transfer center and related recreational facilities in this area. An existing Resource Protection Area (RPA), part of the Huntley Meadows Park wetland system, bisects the Community Business Center. All new development is shown to avoid this environmentally sensitive area.

Scenario Land Uses

In the proposed scenario land use plans, non-residential uses (office, retail, hotel) are clustered around each of the three station areas. Wherever possible, residential uses are shown at least a half block back from Route 1. Where that is not possible, residential uses are separated from Route 1 by open space, such as residential courtyards. A potential Route 1 Bus Transfer Center is shown conceptually on the land use graphic.

Open Space

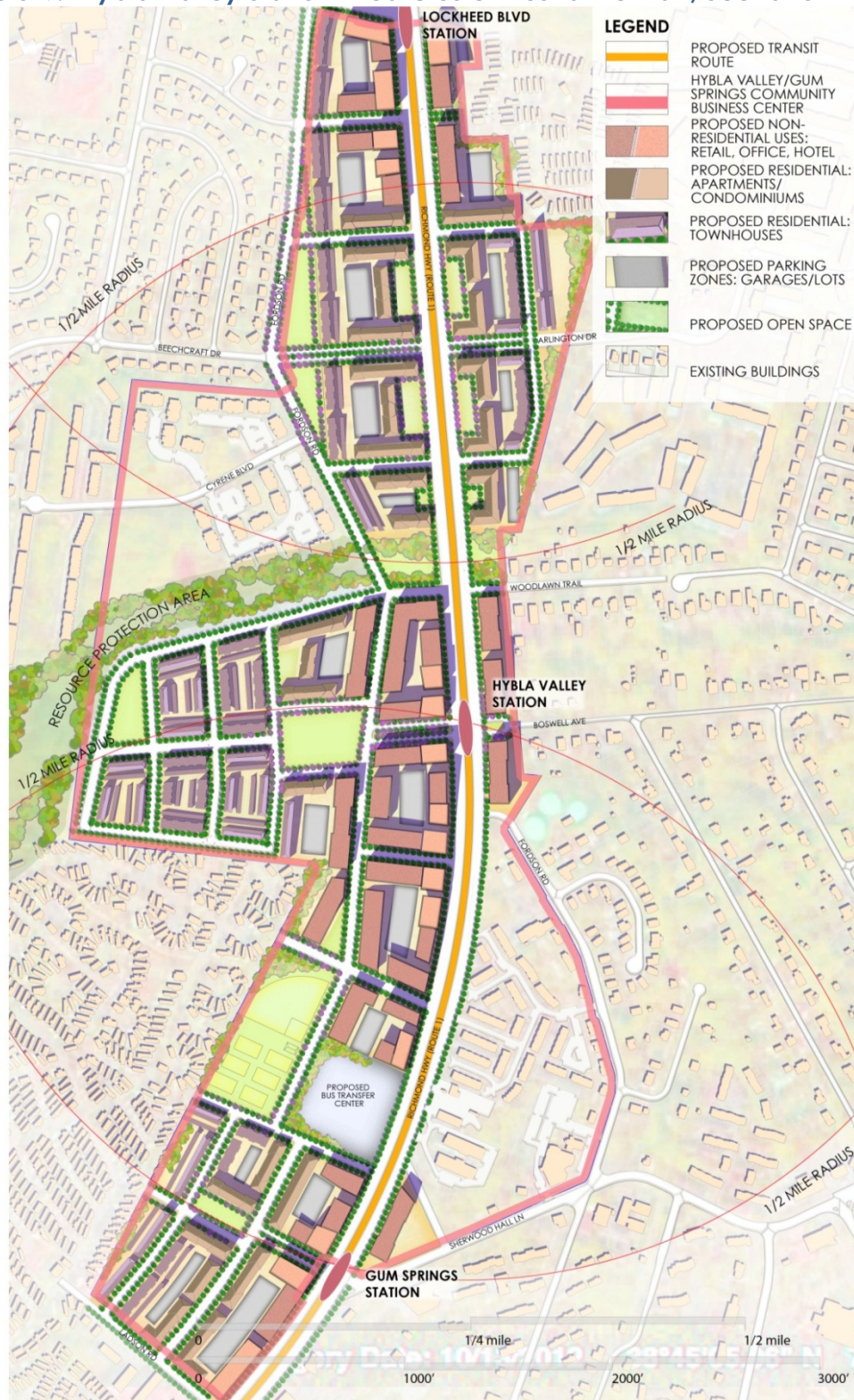
All scenario plans offer significant open spaces, such as town squares, parks, courtyards and boulevards with wide medians. The Resource Protection Area (RPA) could also become a recreational community asset. The recreation facilities associated with the proposed Fairfax County Bus Transfer Center are shown immediately behind the Transfer Center, a block away from Route 1.

Scenario Comparisons

Scenario One (reflecting the MWCOG 2035 forecasts) includes low quantities of residential development. As a result, all residential development could be designed in the form of townhouses. There is a significant difference between the target quantities for both residential and non-residential uses in Scenario One versus Scenario Three. Residential uses in Scenario Three would, for the most part, be accommodated in high-rise apartment buildings. Scenario Three target quantities suggest that development would need to occur beyond the current Community Business Center boundaries.

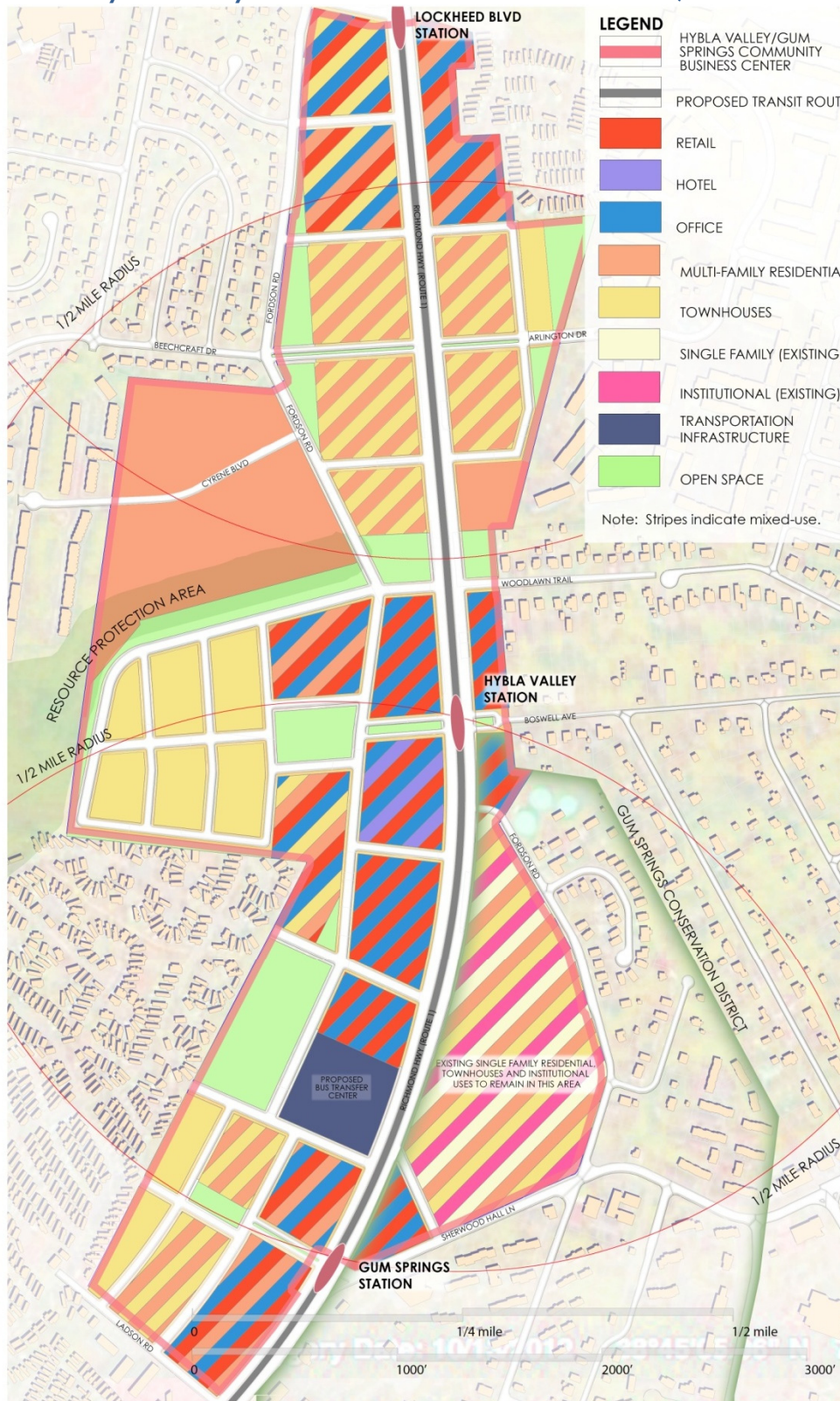
Figures 3-9 and 3-10 present an illustrative plan and a land use plan for the Hybla Valley Station Area Cluster. The illustrative plan shows placement of buildings, location of open spaces and street configuration. The plan illustrates how the new mixed use development relates to the existing multi-family development to the west and the lower-density residential neighborhoods to the east and south. Importantly, both the illustrative and land use plans show preservation of the Gum Springs Conservation District as well as the Resource Protection Area wetland system.

Figure 3-9: Hybla Valley Station Area Cluster Illustrative Plan, Scenario Two



HYBLA VALLEY/GUM SPRINGS ILLUSTRATIVE PLAN

Figure 3-10: Hybla Valley Station Area Cluster Land Use Plan, Scenario Two



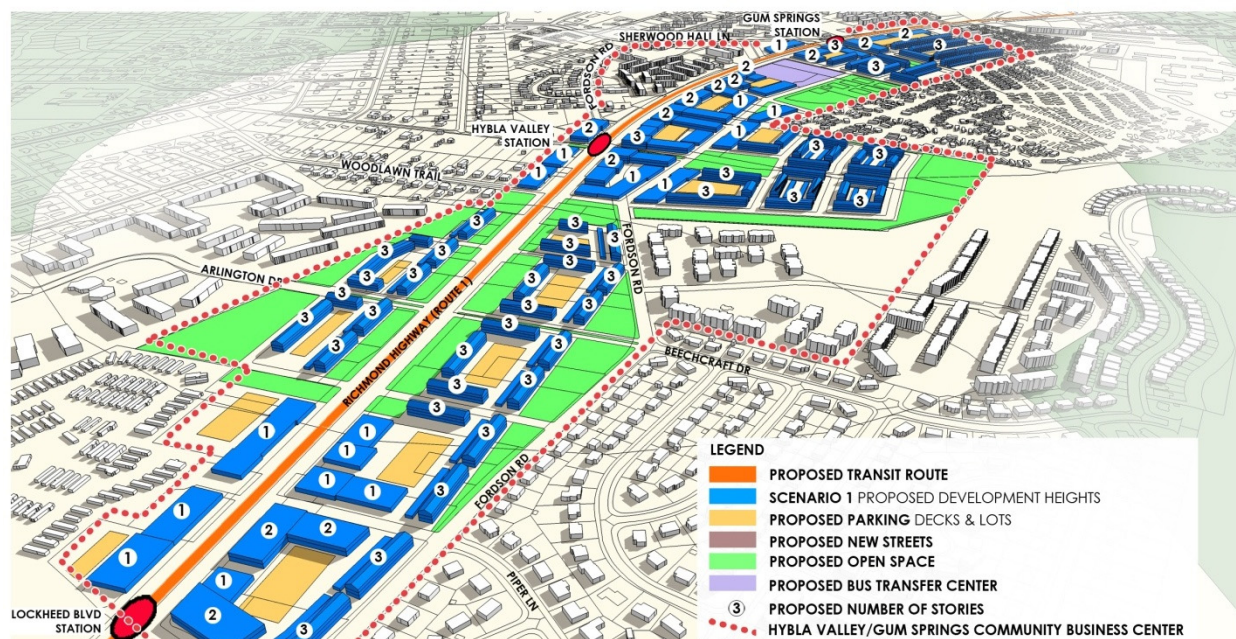
HYBLA VALLEY/GUM SPRINGS LAND USE PLAN

Figure 3-11 demonstrates the potential development massing for Scenarios One, Two, and Three at Hybla Valley. The massing diagrams also include the Fairfax County Comprehensive Plan allowable development potential as a benchmark for comparison.

Several key principles for transit-oriented development are reflected in the land use and urban design plans for the Hybla Valley Station Area Cluster:

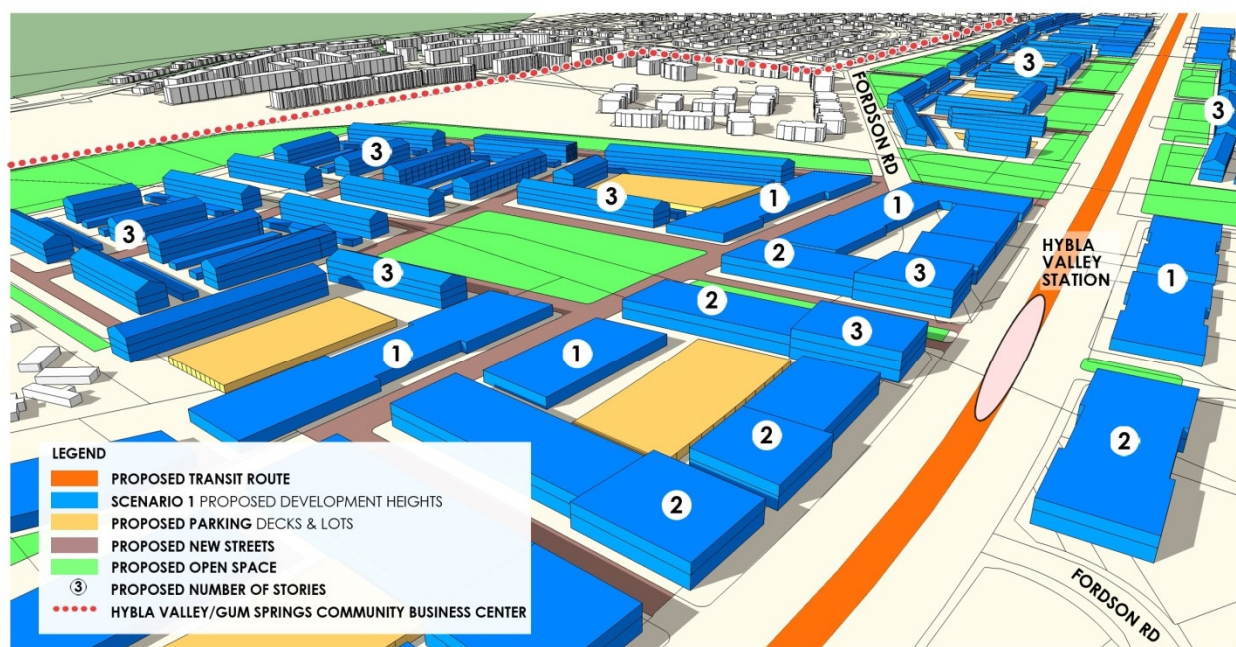
- Higher density development, with buildings highest near station and stepping back to neighborhoods
- A vertical mix of uses, including office, retail and residential
- Pedestrian-oriented street design
- Street connectivity internally and to neighborhoods where possible

Figure 3-11: Hybla Valley Station Area Cluster Massing Diagrams: Scenario One, Comprehensive Plan, and Scenarios Two and Three



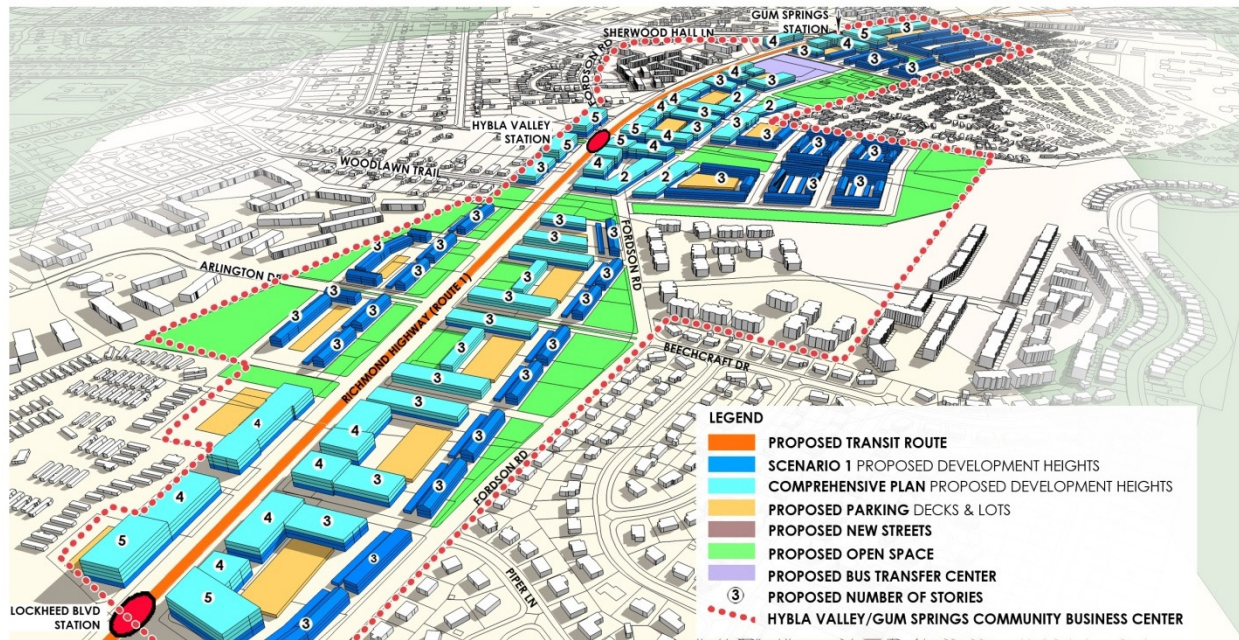
HYBLA VALLEY/GUM SPRINGS SCENARIO 1

VIEW LOOKS SOUTH



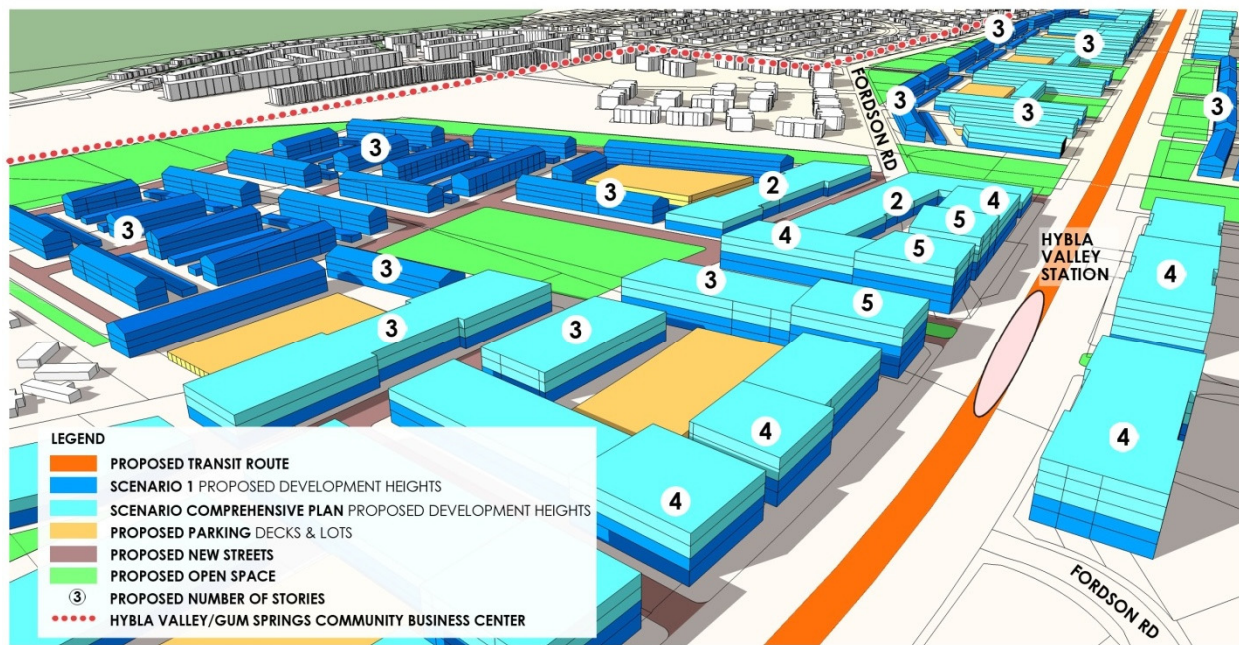
HYBLA VALLEY/GUM SPRINGS SCENARIO 1

VIEW LOOKS NORTH-WEST



HYBLA VALLEY/GUM SPRINGS SCENARIO COMPREHENSIVE PLAN

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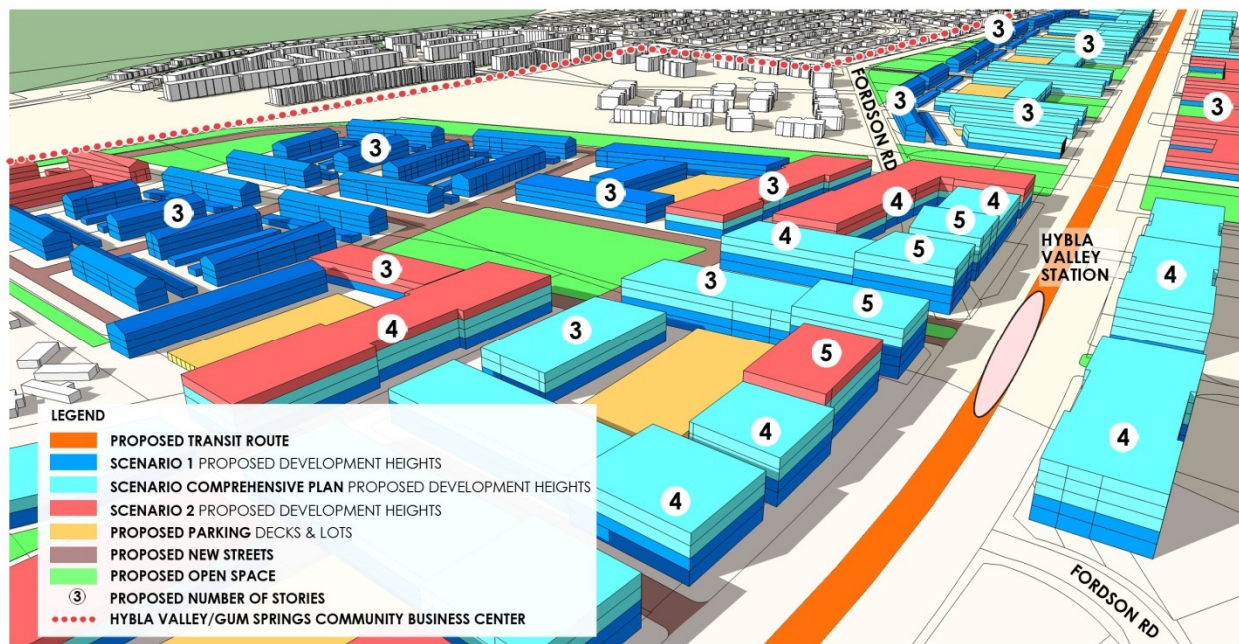
HYBLA VALLEY/GUM SPRINGS SCENARIO COMPREHENSIVE PLAN

VIEW LOOKS NORTH-WEST



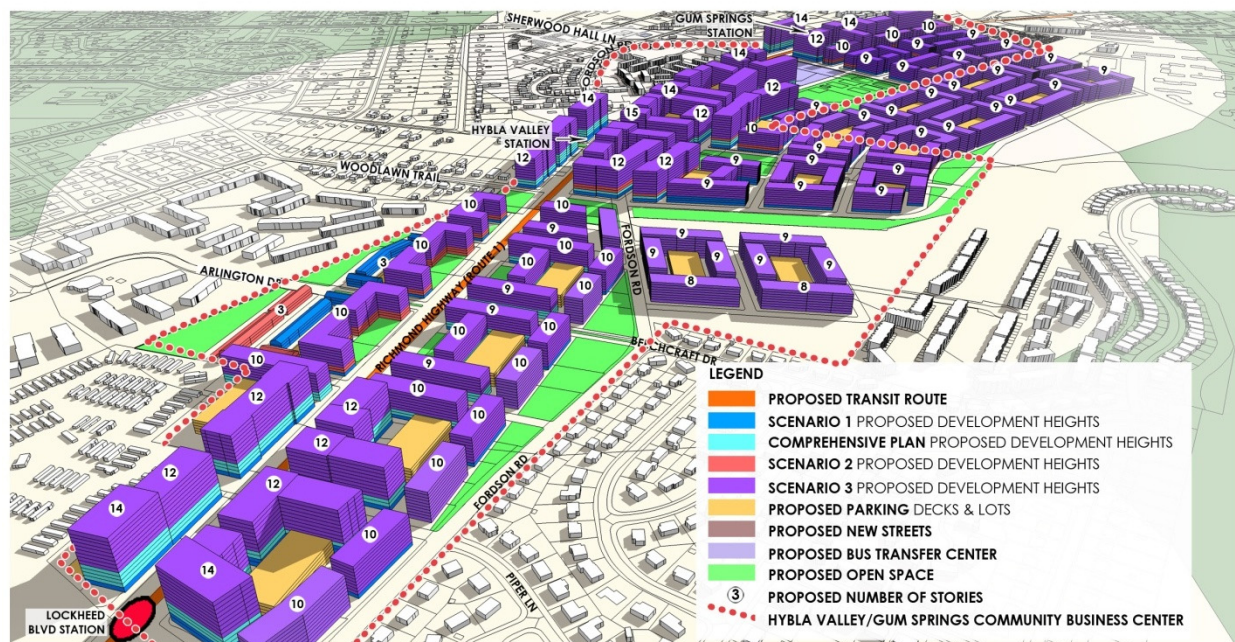
HYBLA VALLEY/GUM SPRINGS SCENARIO 2

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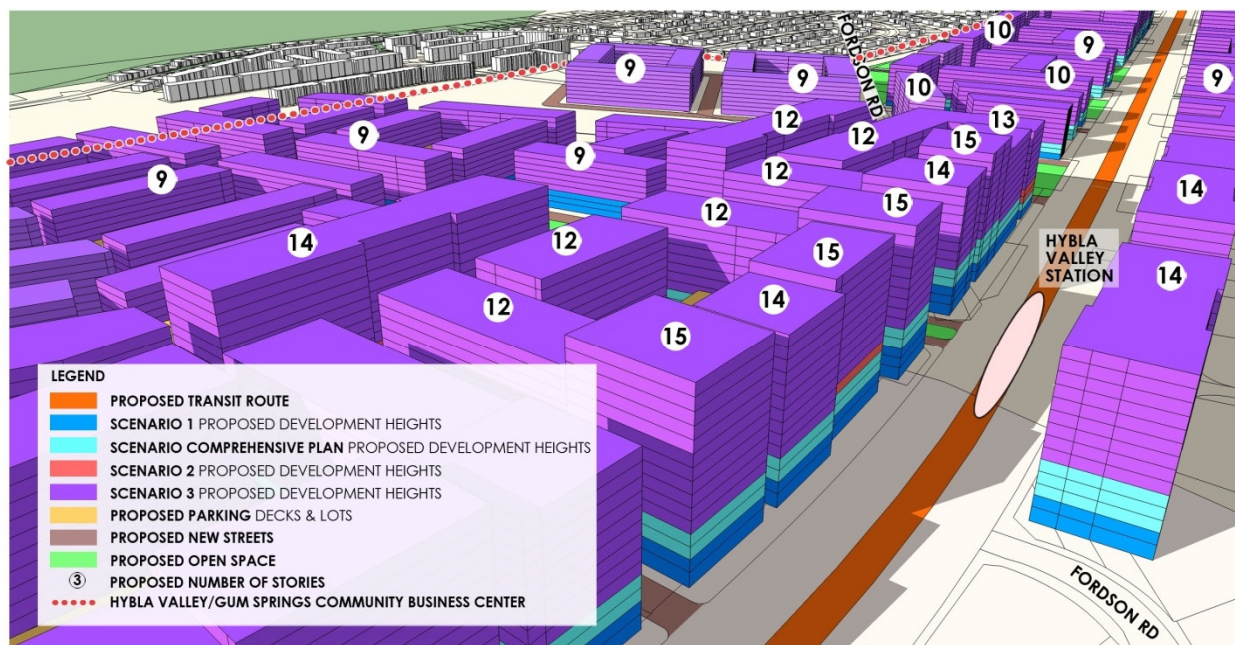
HYBLA VALLEY/GUM SPRINGS SCENARIO 2

VIEW LOOKS NORTH-WEST



HYBLA VALLEY/GUM SPRINGS SCENARIO 3

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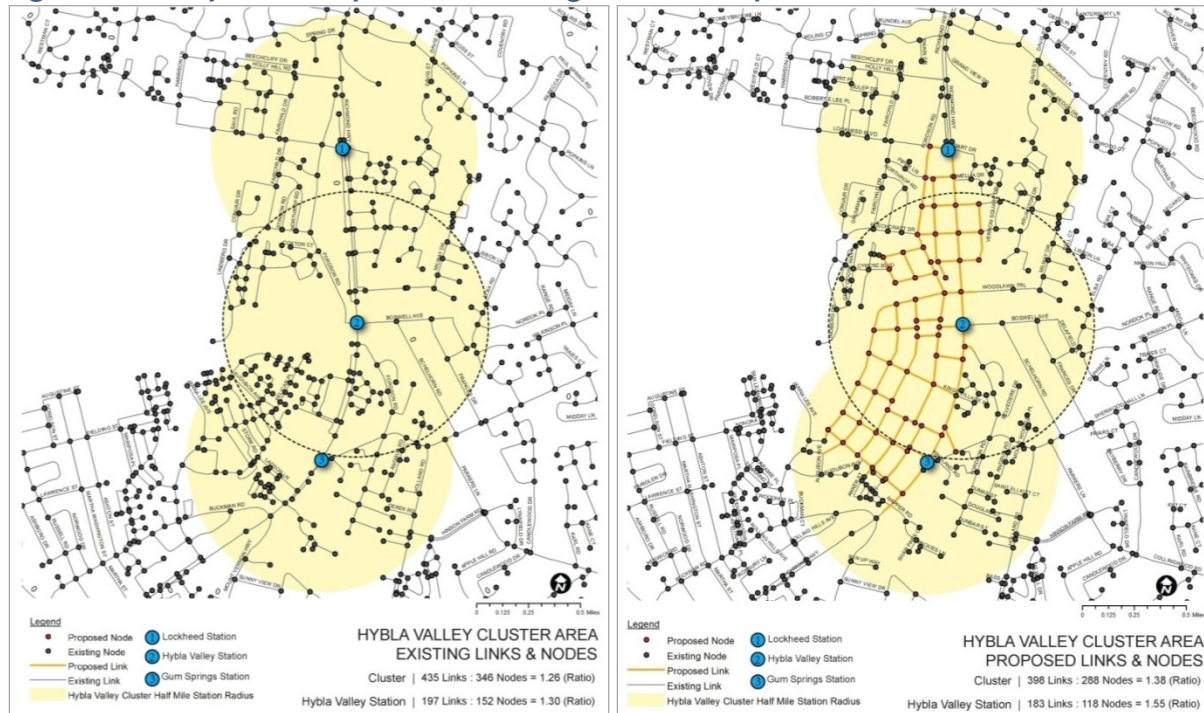


HYBLA VALLEY/GUM SPRINGS SCENARIO 3

VIEW LOOKS NORTH-WEST

Figure 3-12 demonstrates the proposed improvements to the street network as shown in the urban design concept. In the Hybla Valley Station Area, a new grid of streets is shown in the area currently occupied by Mount Vernon Plaza and the associated parking lot. This new grid of streets improves the link (street section) to node (intersection or dead end) ratio from 1.30 to 1.55.

Figure 3-12: Hybla Valley Station Existing and Conceptual Street Network



3.3 Woodbridge Station Area Analysis

The Woodbridge Station Area is the third of three station areas that were studied in further detail for the land use analysis. **Figure 3.13** shows the location of the Woodbridge Station in relation to the other stations on the corridor. **Table 3.3** summarizes the 2010, Scenario One, Scenario Two, Comprehensive Plan, and Scenario Three numbers for this station area.

Figure 3-13: Woodbridge Station Location



Table 3-3: Woodbridge Station Area Scenarios Summary

	Population + Employment	Activity Density	Multimodal Center Type (and Potentially Supported Transit Investment)	FAR (within UMU)	Pop/Jobs Ratio
MWCOG 2010	4,569	9.1	P-3 (Fixed Route Bus)	0.08	1.7
MWCOG 2035 (Scenario One)	11,646	23.2	P-4 (Express Bus)	1.4	2.5
Scenario Two (25% increase on Sc. 1)	14,558	28.9	P-4 (Express Bus)	1.8	1.6
Comprehensive Plan	9,745	19.4	P-4 (Express Bus)	1.3	1.6
Scenario Three	18,611	37.0	P-5 (BRT)	2.0	1.6

Notes:

- All data analyzed within half-mile of the station/station cluster locations (except the FAR, which is calculated within the new development area, which is generally the UMU)
- Activity Density = (Population + Employment)/Acre
- Source for Multimodal Center Type and Potentially Supported Transit Investment: DRPT Multimodal Design Guidelines, 2013
- Pop/Jobs Ratio for Scenarios Two and Three are based on the Comprehensive Plan distributions

County Land Use Plan vs. Scenarios

The Prince William Comprehensive Plan presents a vision for the North Woodbridge area in its Urban Mixed Use plan as a higher-density, mixed-use development area. The scenario plans are consistent with the county intent for future development, showing greater density, and transit supportive land uses with access to the proposed new transit station. This new transit station is proposed in the same location as the current VRE station in order to create a “transit hub” for North Woodbridge.

Unique Features

This station area differs from the other two locations in that the proposed transit station at Woodbridge is located on the southeast side of Route 1 and is connected to the proposed Urban Mixed Use Area and the Park and Ride garages via a pedestrian bridge. In the other two station locations, the station itself was located directly at the future station area development sites. For the Woodbridge site, a large 3,000 space park and ride garage is accommodated in all scenarios. The Virginia Department of Transportation’s (VDOT) proposed grade separated interchange at Route 1/Route 123 is also reflected in all scenarios.

Additionally this location includes a major natural feature, the Occoquan River, which runs along the northern boundary of the Urban Mixed Use Area.

Scenario Land Uses

In the proposed scenario plans, non-residential uses (office, retail and hotel) are generally shown close to the station area within the blocks contained by Gordon Boulevard (Route 123), Jefferson Davis Highway (Route 1), Occoquan Drive and Horner Road, creating a commercial core. Residential uses are predominantly proposed on the north side of Gordon Boulevard, extending toward the Occoquan River. Some limited neighborhood serving retail is shown within this largely residential area, which can also be accessed from Route 1.

Open Space

In the scenario plans, a large riverside community park is located between the river and residential areas to provide a recreational asset for residents and to avoid building in the floodplain. Additionally, a linear park is located between Route 1 and the residential areas; a large town square is shown within the commercial core adjacent to Route 123; and a boulevard with a median connects the town square in the commercial core to another secondary square nestled within the residential area and toward the river.

Scenario Comparisons

Scenario One is the only Woodbridge scenario that proposes residential uses above non-residential uses in the commercial core. This is due to the low quantities of commercial reflected in the MWCOG 2035 forecasts. In the other three scenarios, residential uses are generally located away from the heavily trafficked roads and the commercial core is dedicated to office, commercial, hotels and commuter parking.

Figures 3-14 and 3-15 present a proposed illustrative plan and a land use plan for the Woodbridge Station Area. The illustrative plan shows all development occurring west of Route 1, north and south of Gordon Boulevard. Both plans show park and ride garage areas opposite the Woodbridge VRE station. Preservation of protected floodplains is shown, and Route 1 is shown as a landscaped parkway through the area.

Figure 3-14: Woodbridge Station Illustrative Plan, Scenario Two



Figure 3-15: Woodbridge Station Land Use Plan, Scenario Two

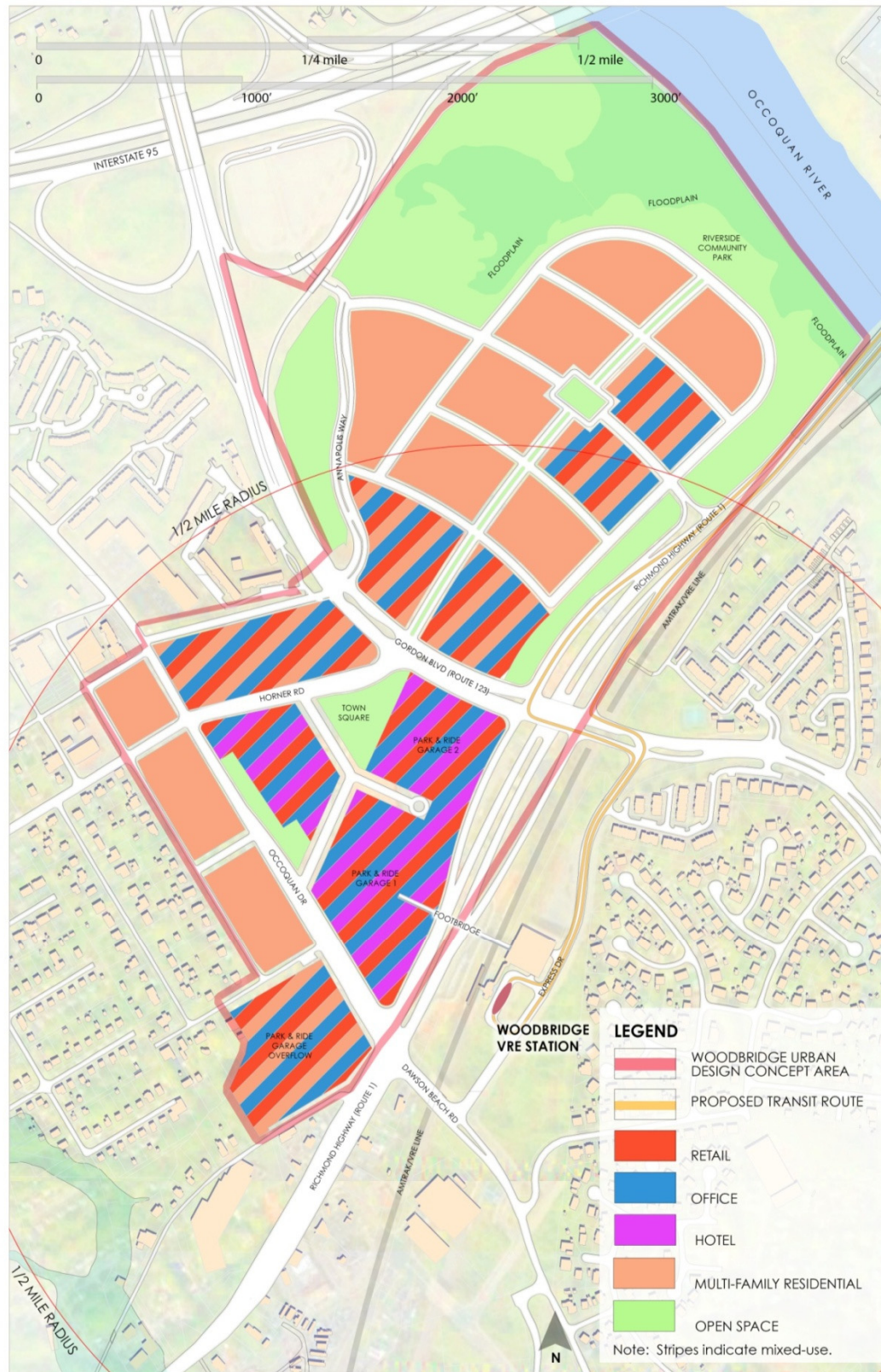
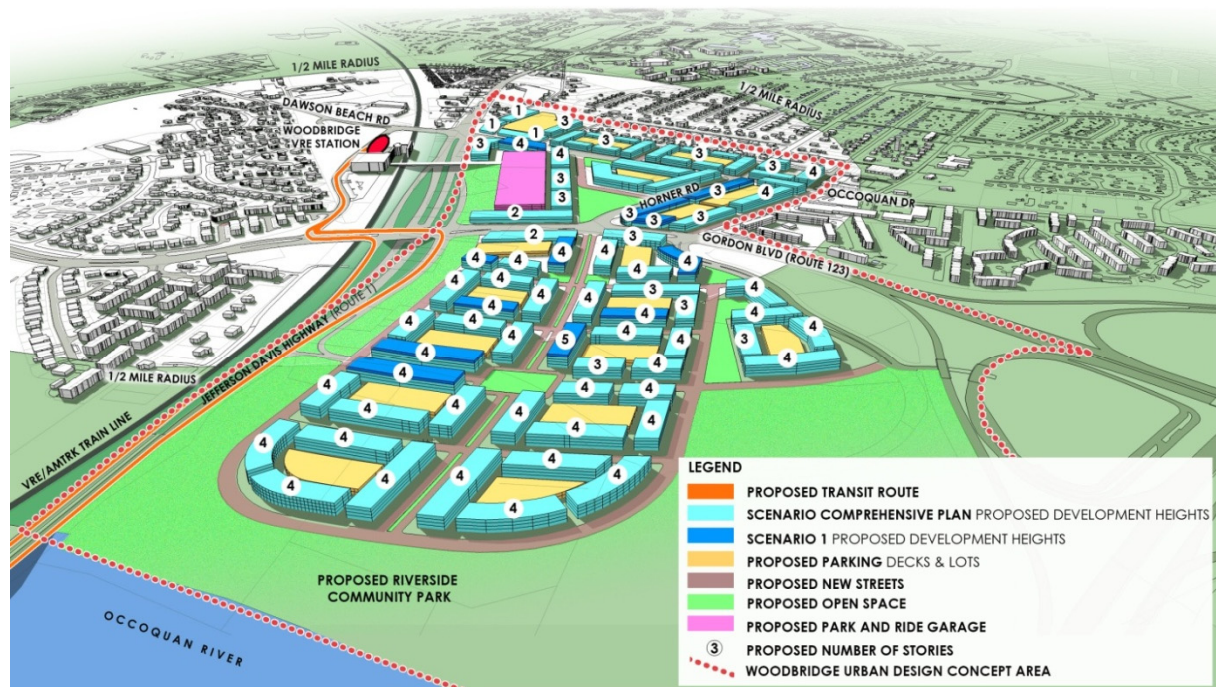


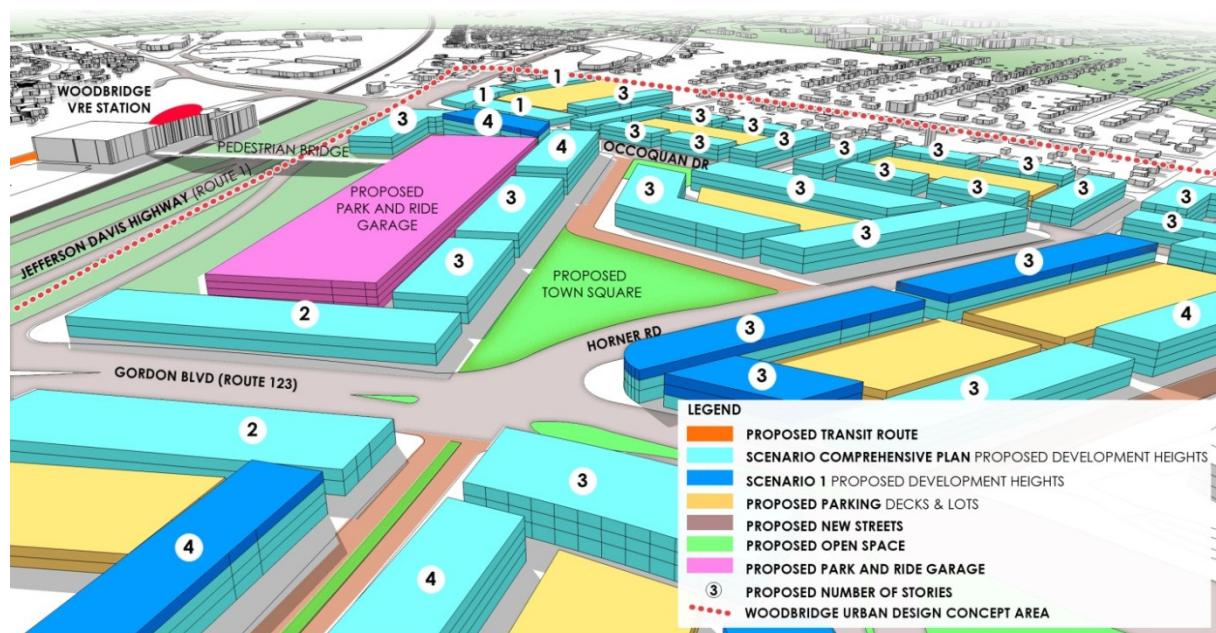
Figure 3-16 (multiple illustrations) demonstrates the potential development massing for Scenarios One and Two at Woodbridge. The massing diagrams also include the Prince William County Comprehensive Plan allowable development as a benchmark for comparison.

Figure 3-16: Woodbridge Station Massing Diagrams: Scenario One, Comprehensive Plan, and Scenarios Two and Three



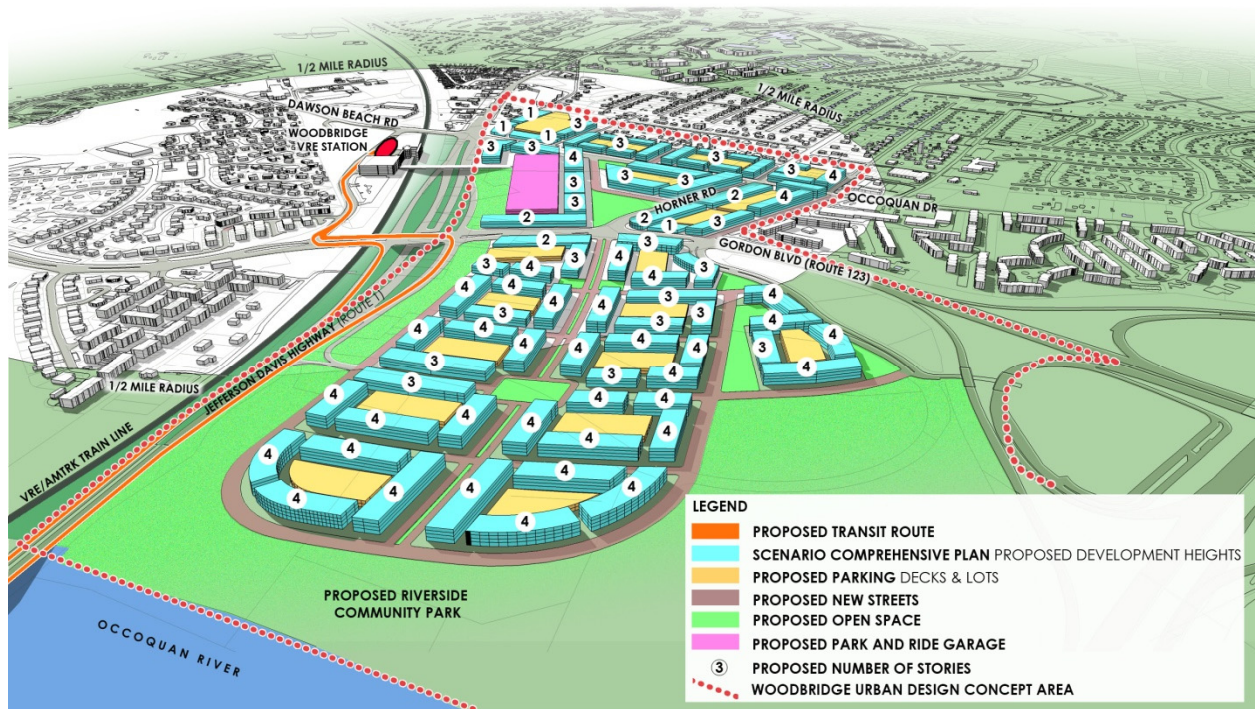
WOODBIDGE SCENARIO 1

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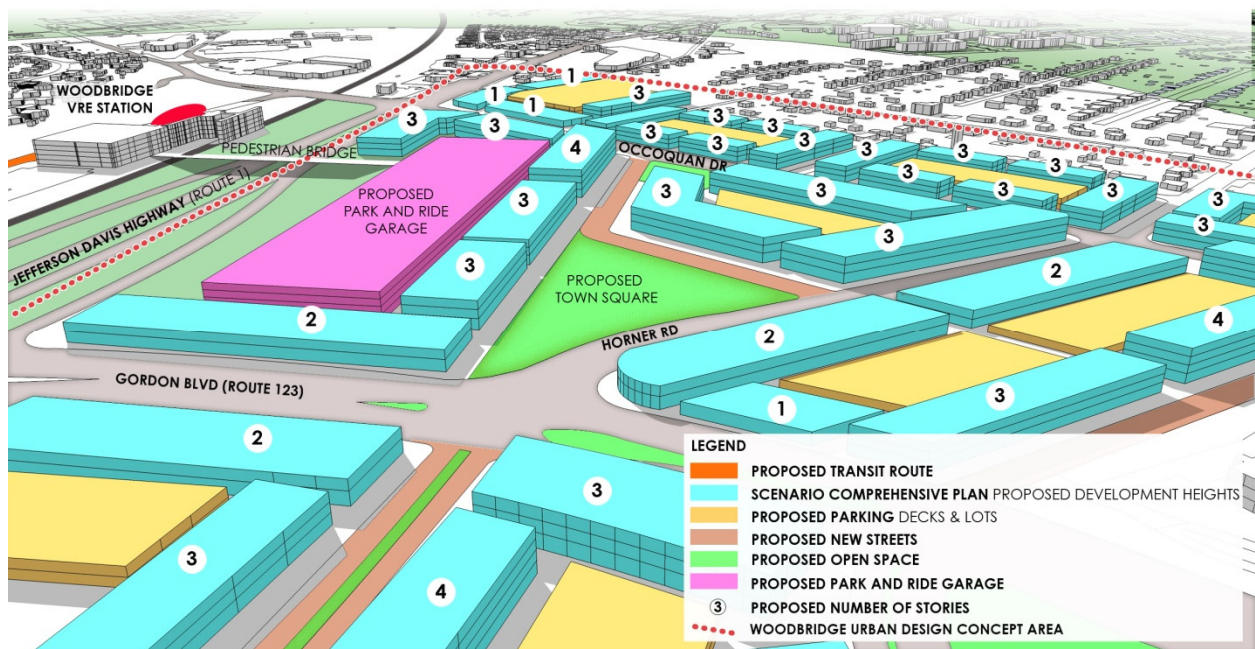
WOODBIDGE SCENARIO 1

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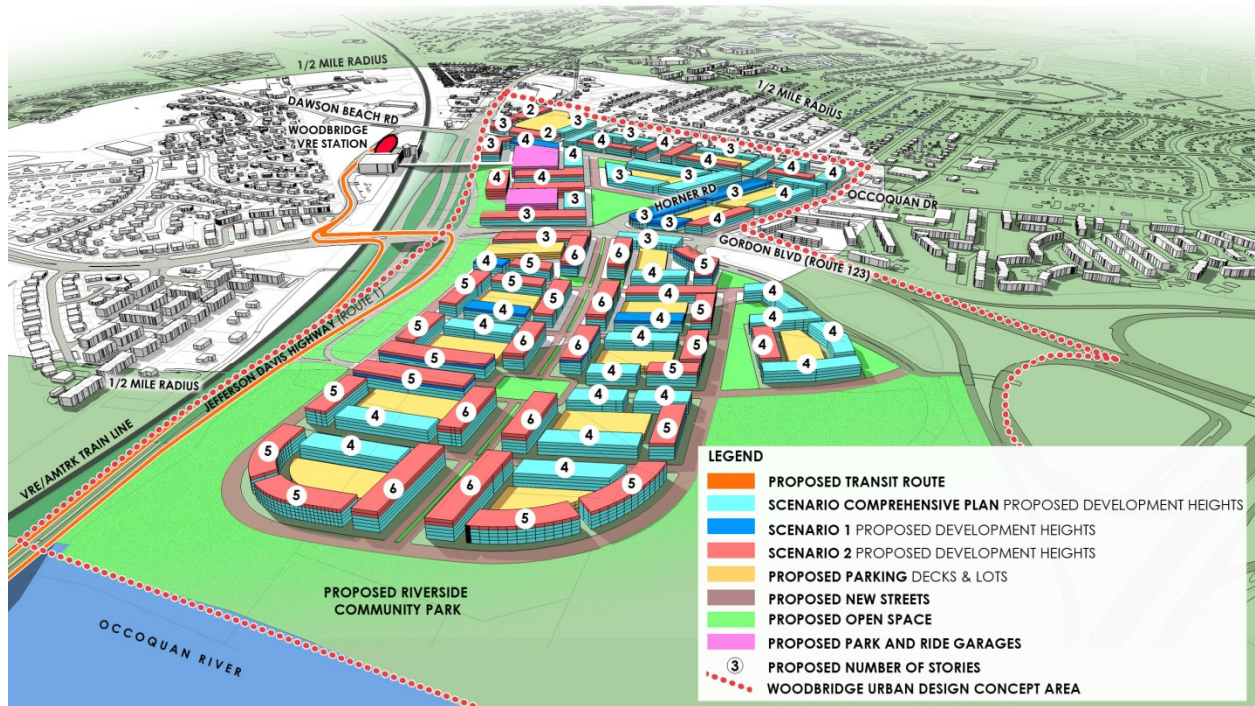
WOODBRIDGE SCENARIO COMPREHENSIVE PLAN

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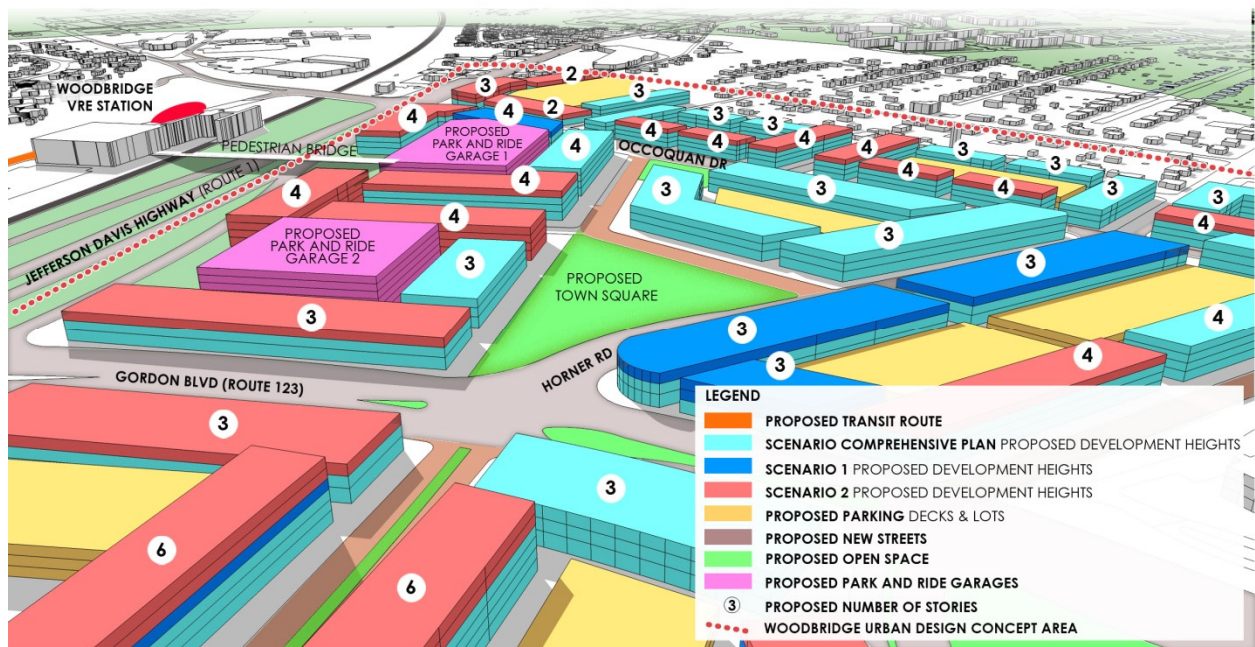
WOODBRIDGE SCENARIO COMPREHENSIVE PLAN

VIEW LOOKS SOUTH-WEST



WOODBIDGE SCENARIO 2

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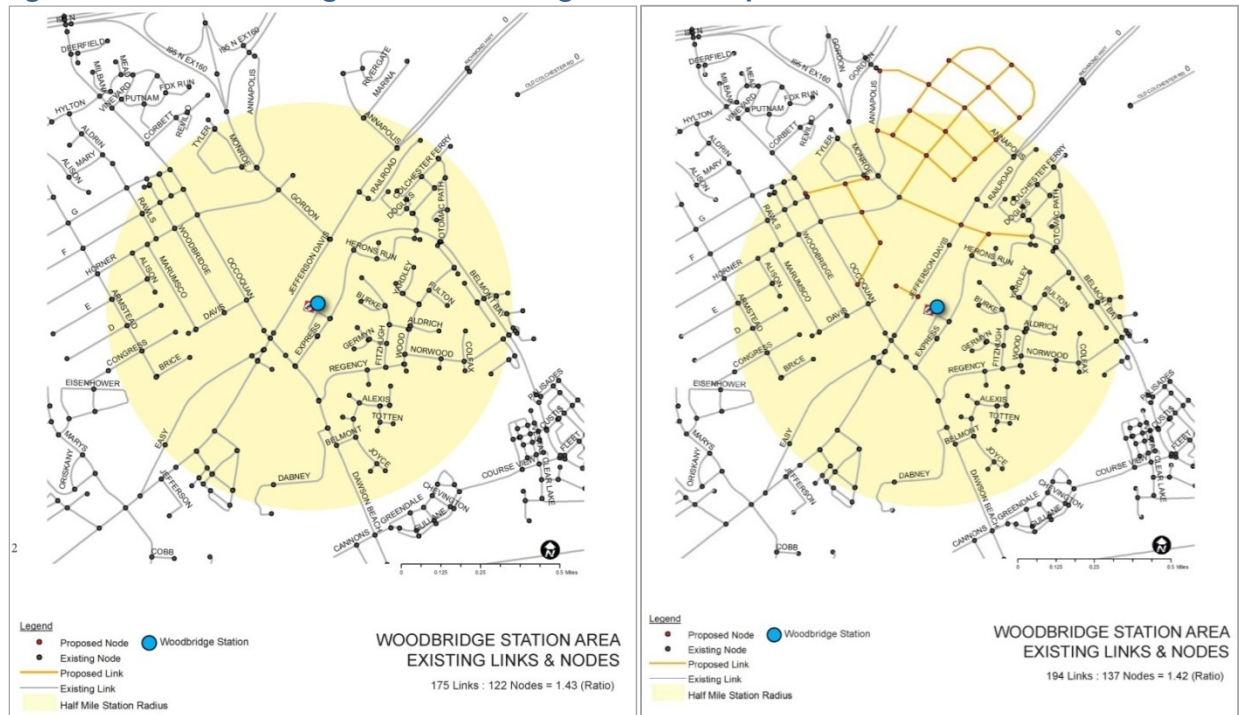


WOODBIDGE SCENARIO 2

VIEW LOOKS SOUTH-WEST

Figure 3-17 demonstrates the proposed improvements to the street network as shown in the urban design concepts. At Woodbridge a new grid of streets is shown on the existing “megablock” that is northwest of the Route1/Route 123 intersection. This new grid of streets increases the “nodes” or street intersections from 122 nodes within the half-mile radius to 137 nodes within that same area. This is a relatively small change because much of the new street grid is outside the half-mile radius of the station.

Figure 3-17: Woodbridge Station Existing and Conceptual Street Network



3.4 Existing Land Use Quantitative Information

This chapter evaluates current land uses using a baseline of quantitative data that allow comparison to other projects and transit corridors across the country. It also summarizes several items useful to a potential FTA funding application:

- Population density per square mile for each proposed station area and the corridor
- Total employment for each proposed station area and the corridor
- Housing density per square mile for each proposed station area

Even though the Route 1 transportation investments may not be funded through an FTA grant, the Capital Investment Program project justification criteria and guidance on local financial commitment represent “best practices” for transit investments and serve as good measures for appropriate scale and benefits of major capital projects.

Tables 3-4 and 3-5 are provided as baseline information on population, employment and housing within the Route 1 corridor. This data would be required as part of a future FTA New Starts funding application.

Table 3-4: Fairfax and Prince William Counties Land Use Data

County Demographic	County - 2010	All Station Areas within half-mile buffer
Housing Units	522,412	19,275
Affordable Housing ¹³	15,199	2,170 ¹⁴

Table 3-5: Corridor-wide Land Use Data

Demographic	Countywide Total--2010 (Fairfax)	Countywide Total--2010 (Prince William)	Corridor – 2010 (with half-mile buffer)	All Station Areas within half-mile buffer
Corridor land area	406.3 sq. mi.	348.5 sq. mi.	15.7 square miles	9.3 square miles
Total population	1,081,726	402,002	67,038	51,306
Total employment	558,906	83,363	27,000	19,891
Population density	2,766.8 persons/sq. mi.	1195.0 persons/sq. mi.	4,280.5 persons per sq.mi.	5,496.6 persons per sq. mi.
Employment density	1375.8 persons/sq. mi.	239.2 persons/sq. mi.	1,724.0 persons per sq.mi.	2,130.2 persons per sq. mi.

Source: 2010 Census, 2010 County Business Patterns, and MWCOG 8.2

¹³ Affordable housing refers to legally-binding, affordability-restricted housing under the definition used by the FTA: “a lien, deed of trust or other legal instrument attached to a property and/or housing structure that restricts the cost of the housing units to be affordable to renters and/or owners with incomes below 60 percent of the area median income for a defined period of time. This definition includes, but is not limited to state or Federally supported public housing, and housing owned by organizations dedicated to providing affordable housing.”

¹⁴ Estimate requiring further research prior to official FTA application.

3.5 Existing Land Use Assessment

An assessment of existing land use, using both quantitative and qualitative data, is a necessary part of the documentation for an FTA New Starts funding application¹⁵. **Table 3-6** gives an abbreviated summary of the FTA ratings breakpoints and an assessment for each station area or a cluster/grouping of stations. Possible rating scores are provided based on the assessment of current 2010 data for population, employment, housing and land use conditions.

The possible overall rating for the Land Use criterion is **Low**, based on the low-medium density of population, low total employment within corridor, automobile-centric development patterns, and lack of pedestrian facilities and connections to transit locations. The ratio of corridor affordable housing to county-total affordable housing is the only criterion where the corridor is likely to achieve a rating of Medium or above.

Table 3-6: Existing Land Use

Information Requested	FTA Ratings Breakpoint	Station Cluster	Assessment	Possible Rating
Existing corridor and station area development	High: Avg. population density >15,000 persons per sq. mile; employment served by project >220,000	Huntington Metrorail station	Within half-mile radius of station area, population density in 2010 is 9,733. Total employment is 1,116.	Medium
		Penn Daw and Beacon	Within half-mile radius of station areas, population density in 2010 is 5,476. Total employment is 4,038.	Low-Medium
	Medium: Avg. population density 5,760-9,600 per sq. mile; employment served by project 70,000-139,999	Lockheed, Hybla Valley & Gum Springs	Within half-mile radius of station areas, population density in 2010 is 8,274. Total employment is 4,690.	Low-Medium
		South County, Woodlawn, Fort Belvoir	Within half-mile radius of station areas, population density in 2010 is 4,333. Total employment is 5,769.	Low
	Low: Avg. population density <2,560 per sq. mile; employment served by project <40,000	Pohick, Lorton Blvd. Gunston Rd	Within half-mile radius of station areas, population density in 2010 is 3,645. Total employment is 2,676.	Low
		Woodbridge	Within half-mile radius of station area, population density in 2010 is 3,576. Total employment is 1,632.	Low

¹⁵ *Guidelines for Land Use and Economic Development Effects for New Starts and Small Starts Projects*. US Department of Transportation, Federal Transit Administration Office of Planning, August 2013.

Information Requested	FTA Ratings Breakpoint	Station Cluster	Assessment	Possible Rating
Existing corridor and station area development character	High. Site and urban design scaled to pedestrian use, with fine-grained mix of uses conducive to foot traffic. Medium. Urban design a mix of auto-oriented and pedestrian scale; less conducive to foot traffic. Low. Corridor is primarily auto-oriented with large parking lots and absence of pedestrian facilities	Huntington	Current development is trending to more walkable; area still lacks fine grained mix of uses.	Medium
		Penn Daw, Beacon, Lockheed, Hybla Valley & Gum Springs	Extensive large areas of parking throughout this section serving commercial strip district. Walking is difficult and dangerous in some areas.	Low
		South County, Woodlawn, Fort Belvoir	South County has a town center character; Woodlawn and Fort Belvoir are suburban in character. Little foot traffic, highly auto-oriented.	Low
		Pohick, Lorton Blvd. Gunston Rd	Lorton has a town center character; Pohick and Gunston are suburban in character. Little foot traffic, highly auto-oriented.	Low
		Woodbridge	Extensive large areas of parking throughout this section serving commercial strip district. Walking is difficult due to lack of facilities.	Low
Existing station area pedestrian facilities, including access for persons with disabilities	High. Continuous sidewalks, well marked crosswalks, adequate lighting and ADA facilities throughout. Medium. Sidewalks may be discontinuous, with some crosswalks missing, lighting less than optimal. Low. Many sidewalks & crosswalks missing, lighting not adequate, ADA facilities not provided.	Huntington	Pedestrian facilities surrounding Huntington Metro station are adequate.	Medium
		Penn Daw, Beacon, Lockheed, Hybla Valley & Gum Springs	Pedestrian sidewalks missing along corridor and within the CBCs. Few crosswalks. Lighting is at level for automobiles, not pedestrians.	Low
		South County, Woodlawn, Fort Belvoir	Same as above.	Low
		Pohick, Lorton Blvd. Gunston Rd	Same as above.	Low
		Woodbridge	Same as above.	Low

Information Requested	FTA Ratings Breakpoint	Station Cluster	Assessment	Possible Rating
Existing corridor and station area parking supply	High. CBD cost >\$16/day; spaces per employee <0.2 Medium. CBD cost \$12-\$16/day; spaces per employee 0.3-0.4 Low. CBD cost <\$4/day; spaces per employee >0.5	Huntington	On-street parking is limited at the Huntington Metro station. Cost of parking within Washington DC CBD >\$16/day. Cost of parking at Huntington Metro Station is \$4.85 per day for 3,617 spaces.	Medium-High.
		Penn Daw, Beacon, Lockheed, Hybla Valley & Gum Springs	Parking is free and widely available within all CBC areas for employees and patrons of retail areas. Adequate parking for residents of multi-family units.	Low.
		South County, Woodlawn, Fort Belvoir, Pohick, Lorton Blvd. Gunston Rd	Parking is free and generally available within South County and Woodlawn CBCs. Limited area for parking at Fort Belvoir and Pohick station areas. Adequate parking for residents of multi-family units at all areas.	Low.
		Woodbridge	Parking is free and widely available within all CBC areas for employees and patrons of retail areas. Limited parking available at VRE station.	Low.
Proportion of existing legally binding affordability restricted housing in the corridor compared to the proportion of legally binding affordability restricted housing in the counties in which the project travels	High. Ratio of corridor affordable housing (as a share of total housing) to county total share is >2.5. Medium. Ratio of corridor affordable housing to county total is 1.50 to 2.24. Low. Ratio of corridor affordable housing to county total is <1.10.	Huntington	No quantitative measure available for legally binding affordability restricted housing in this area. Market rate affordable housing likely exists within a ½ mile of the station.	Medium.
		Penn Daw, Beacon, Lockheed, Hybla Valley & Gum Springs	Quantitative measure of existing legally binding affordable housing is > 2.50. Station areas have some of highest ratio of affordable housing within county.	High.
		South County, Woodlawn, Fort Belvoir, Pohick, Lorton Blvd. Gunston Rd	No quantitative measure available for legally binding affordability restricted housing in this area. Market rate affordable housing likely exists within a ½ mile of the station. .	Medium.
		Woodbridge	Housing is currently very limited within 1.2 miles of station area. No legally binding affordability restricted housing.	Low.

3.6 Economic Development Effects Assessment

3.6.1 Assessment of land use policies for transit supportive development

Transit-supportive plans and policies is an FTA rating criterion with multiple factors, including growth management, transit-supportive corridor policies, supportive zoning regulations near transit stations, and tools to implement transit supportive plans and policies. Relevant documentation for each of these factors is listed in **Tables 3-7** through **3-10**, below.

Fairfax County has taken steps to concentrate development around future station areas by allowing increased development densities at Huntington Station (3.0 FAR) and at Beacon (performance based development potential). Developers have begun to propose projects in line with the county's expectations for greater densities in the north end of the Route 1 corridor. The middle section of the corridor and the south corridor below Fort Belvoir within Fairfax County remain at relatively low densities; Fairfax County does not have plans to increase densities to transit-supportive levels at these future station areas. For Prince William County, the as-of-right development is low-density commercial; the county has adopted policies to increase density in the Woodbridge vicinity to an FAR of 1.65, which would support higher-capacity transit.

Fairfax County has also initiated, or participated in, planning processes to accelerate the development of high-capacity transit within the project corridor. In addition to the Route 1 Multimodal Alternatives Analysis, the county has undertaken a High-Quality Transit Network Concept Study, which included consideration of Route 1 as a corridor for increased transit options.¹⁶

The possible FTA rating for Economic Development Effects is **Low-Medium**. The tables below list recommendations that the counties could implement to attempt to improve potential ratings. Once the station areas have been formally defined and a locally-preferred transit alternative selected, this information would be updated as needed to support a potential FTA New Starts funding application.

¹⁶ *Proposed 2050 High Quality Transit Network Concept*, Fairfax County Department of Transportation. Website accessed March 2014. <http://www.fairfaxcounty.gov/fcdot/2050transitstudy/>

Table 3-7: Transit-Supportive Plans and Policies: Growth Management

Information Requested	FTA Ratings Breakpoint	Assessment	Possible Rating	Recommendations
Concentration of development around established activity centers and regional transit	High. Existing and planned densities & market trends strongly support transit. Medium. Incentive-based (voluntary) policies; densities moderately supportive. Low. Policies weak or limited; densities minimally supportive	Both counties have comprehensive plans in place to concentrate development around established activity centers. Fairfax County Comprehensive Plan envisions six Community Business Centers (CBC) along Rt 1 Corridor and one Transit Station Area: Huntington Transit Station Area, North Gateway CBC, Penn Daw CBC, Beacon/Groveton CBC, Hybla Valley/Gum Springs CBC, South County Center CBC and Woodlawn CBC. Prince William County Urban Mixed Use Area envisions a mixed use land use strategy for a proposed transit-related development near the VRE Station at Woodbridge. Stations in north end of corridor are beginning to see development densities that are supportive of transit.	Low-Medium. Both counties have created activity centers along corridor. However, development densities and market trends are not yet supportive of transit.	To potentially achieve medium-high rating, Fairfax County can consider allowing higher densities in the CBCs south of Beacon/Groveton, and creating plans for higher density, mixed-use development activity centers supportive of transit in the proposed station areas in Lorton and at Fort Belvoir. Prince William can consider allowing higher densities in its UMU at North Woodbridge. Both counties could adopt policies restricting infrastructure outside of designated growth areas, as well as smart-growth codes that specify pedestrian-friendly design for new developments.
Land conservation and management				

Table 3-8: Transit-Supportive Plans and Policies: Transit-Supportive Corridor Policies

Information Requested	FTA Ratings Breakpoint	Assessment	Possible Rating	Recommendations
Plans and policies to increase corridor and station area development	High. Conceptual plans for corridor & station area. Proposed development patterns in local comprehensive plans strongly support transit investment.	Prince William County has created a conceptual plan for North Woodbridge near the VRE station. Fairfax County is in the process of creating a conceptual plan for Huntington Station Area; conceptual plans for other station areas have not yet begun. Development patterns in the north end of the corridor, including Huntington Metro station and Penn Daw and Beacon station areas are beginning to see development patterns that are supportive of transit investment.	Low-Medium. Conceptual planning for station areas is in the early stages, with the exception of Huntington and Woodbridge. Development patterns are starting to be more transit-supportive.	To potentially achieve a Medium rating, the counties can develop conceptual station area plans and multimodal system plans for stations that do not have plans at present.
Plans and policies to enhance transit-friendly character of corridor and station area development	Medium. Conceptual plans for corridor & stations being developed. Development patterns moderately supportive of transit investment.	Fairfax County has a policy, Guidelines for Transit-Oriented Development, in the adopted Comprehensive Plan.	Pedestrian plans and guidelines are limited to the area around Huntington Metro station.	Fairfax County can ensure implementation and enforcement of the Guidelines for Transit-Oriented Development.
Plans to improve pedestrian facilities, including facilities for persons with disabilities	Low. Limited progress toward station area plans; development patterns marginally supportive of transit investment.	The policy identifies principles for TOD including higher density, mixed-use, pedestrian connectivity, affordable housing mix, economic development	Parking policies, such as parking maximums, shared parking and parking fee structures do not yet exist in the corridor.	The counties can also adopt urban design requirements for the station areas that ensure building placement and sidewalk/streetscape design that promotes pedestrian activity. Policies could also require street networks and a mix of uses in new development.
Parking policies				The counties may also consider developing parking policies that incorporate shared use parking and maximum parking requirements for new mixed-use developments.

Table 3-9: Transit-Supportive Plans and Policies: Supportive Zoning Regulations near Transit Stations

Information Requested	FTA Ratings Breakpoints	Assessment	Possible Rating	Recommendations
Existing and proposed zoning regulations that allow densities supportive of transit	High. Strong zoning regulations in most or all station areas. Incentives for increased development in station areas.	Fairfax and Prince William counties have begun to implement mixed-use zoning allowing for higher densities around proposed station areas, including Huntington, Beacon and Woodbridge stations. Lower-density commercial zoning still predominates in the remaining station areas, as well as portions of Beacon and Woodbridge. As-of-right low density zoning remains an issue in Prince William County.	Low-Medium. Both local jurisdictions are examining zoning to support transit; the effort is still in initial stages and has not yet begun to swing densities to transit-supportive levels except in Huntington.	To potentially achieve a Medium rating, the counties can continue to examine zoning around proposed station areas for higher densities (FTA Rating Guide uses an FAR = 6.0 in the CBD as the threshold for Medium.). Urban design guidelines, transit-supportive overlay districts and incentive structures for increasing density are part of a transit-supportive planning package.
Zoning ordinances that enhance transit oriented character of stations	Medium. Local jurisdictions are examining and changing zoning to support transit. Low. Initial efforts only to prepare station area plans and related zoning.	Reduced parking requirements are not yet used as a tool to increase development. Fairfax County allows bicycle facilities as a traffic mitigation strategy. Fairfax has implemented additional transportation demand strategies designed to reduce vehicle miles traveled (VMT) such as ridesharing, vanpools, and employer-subsidized transit passes.		
Zoning allowances for reduced parking and traffic mitigation	Existing zoning marginally or not transit supportive			

Table 3-10: Transit-Supportive Plans and Policies: Tools to Implement Land Use Policies

Information Requested	FTA Ratings Breakpoint	Assessment	Possible Rating	Recommendations
Outreach to government agencies and the community in support of transit-supportive planning	High. Agencies are working proactively to promote transit-supportive planning and station area development. Capital improvement programs support transit investment.	The counties and the state transit agency (DRPT) have begun preliminary outreach as part of this study and the Fairfax Countywide Transit Network Study. Current VDOT roadway improvements accommodate a median-running transit lane and a separated multi-use path. Fairfax County has an extensive program of public outreach through their land use approval process and would utilize this process in the consideration of future station areas. Revitalization and Incentive programs exist but a fuller range of tools is needed to attract transit-supportive development densities.	Low-Medium. The counties have not yet made transit supportive development a priority along the Route 1 corridor, with the result being that low density commercial centers continue to be developed.	To potentially achieve a Medium rating, counties should incorporate successful elements from their other transit focused land use studies into a corridor or station area planning process. The process should accommodate specific outreach to transit-dependent populations such as affordable housing residents and senior citizens. Building off the Comprehensive Plans, a more complete range of incentives designed to promote density at transit stations can be developed, including streamlined permits, reduced zoning requirements for traffic mitigation fees and land assembly programs.
Regulatory and financial incentives to promote transit-supportive development	Medium. Some outreach has been conducted; incentives to promote TOD are being investigated.			
Efforts to engage the development community in station area planning and transit-supportive development	Low. Limited effort has been made to promote transit planning; little or no effort to identify capital improvements.			

Performance and Impacts of Policies

Since this analysis is proposing station areas and a preferred alternative for future transit, it precedes development of station-specific policies of the sort needed to address the Performance and Impacts of Policies criterion described in the following tables. **Tables 3-11 and 3-12** should be completed as part of a future FTA funding application.

Table 3-11: Performance and Impacts of Policies: Performance of Transit-Supportive Plans and Policies

Information Requested	FTA Ratings Breakpoints	Assessment	Possible Rating	Recommendations
Demonstrated cases of developments affected by transit-supportive policies	High. Transit supportive housing and employment is occurring in the corridor. Significant amounts of TOD have occurred in the region.	Successful examples of transit-supportive development exist in the corridor, notably development near the Huntington Metro Station.	Medium. Station locations on this corridor have not yet been established, however transit supportive policies have been established in the region and their effects have been demonstrated through the presence of transit-supportive development patterns.	Study what has worked elsewhere in the region in order to reinforce policies for this corridor that will result in transit-supportive development.
Station area development proposals and status	Medium. Station locations have not been established, so TOD would not be expected. Low. Other transit corridors in the region lack examples of transit supportive housing and employment.			

Table 3-12: Performance and Impacts of Policies: Potential Impact of Transit Investment on Regional Development

Information Requested	FTA Ratings Breakpoints	Assessment	Possible Rating	Recommendations
Adaptability of station area land for development	<p>High. A significant amount of land in station areas is available for new development or redevelopment at transit-supportive densities. Local plans and market conditions strongly support this development.</p> <p>Medium. Moderate amount of land available; local plans & market conditions moderately support such development.</p> <p>Low. Modest amount of developable land; plans and local market provide marginal support for transit station development.</p>	Forecasted population and employment for the corridor shows reasonably strong growth in the north; less growth in the middle and south parts of the corridor. Available land for redevelopment exists as commercial centers age; however, the parcel analysis shows that there are relatively few large development sites, so parcel assembly would be required. As of yet, market impetus for mixed-use development is limited to station areas in the north – Huntington, Penn Daw and Beacon.	Low-Medium.	To determine if a medium or low rating is appropriate, the counties should conduct a market study that examines short- and long-term opportunities for different types of development in the corridor and station areas. An initial assessment of existing and potential development values around the stations is presented in Chapter 4, Economic Development Analysis.
Corridor economic environment				

3.6.2 Tools to Maintain or Increase Share of Affordable Housing in Corridor

Both Fairfax and Prince William Counties are in the process of preparing updated affordable housing plans. Fairfax is in the process of adopting more rigorous standards for its expected high-growth areas. These standards are likely to be adjusted for the Route 1 corridor, which already possesses a substantial proportion of the county's affordable housing. Fairfax has also moved to preserve the current stock of affordable housing in the corridor by adopting a mobile home retention policy and continuing to study the issue of affordable home ownership.

Table 3-13: Tools to maintain or increase share of affordable housing in corridor

Information Requested	FTA Ratings Breakpoints	Assessment	Likely Rating	Recommendations
Evaluation of corridor-specific affordable housing needs and supply	High. Plans and policies to address current and prospective affordable housing are in place along the corridor, together with robust financial incentives. Developers are actively working to secure affordable housing sites.	Prince William County has conducted a 2012 Housing Affordability study to engage economic partners around affordable housing preservation. Policies also focus on needs of very low-income households. Fairfax County Affordable Dwelling Unit program provides potential density bonuses up to 20% to new development, based on housing type. In addition, the Fairfax County Comprehensive Plan encourages at least 12% of all residential development to be affordable.	Medium-High. The current stock of affordable housing is plentiful; Fairfax plans to increase this with new development. Prince William County is identifying locations for affordable housing in the corridor, though not at North Woodbridge.	To obtain a higher rating, the counties should evaluate the best strategy for the corridor, which could focus on preservation of existing affordable housing ratios. Continue and expand programs for density bonuses and inclusion of affordable units in market rate development.
Adopted financing tools and strategies targeted to preserving and increasing affordable housing in the region and/or corridor	Medium. Affordable housing plans and development strategies are being prepared to preserve existing housing and address needs of very low income.			
Evidence of developer activity to preserve and increase affordable housing in the corridor	Low. Policies are not in place; financing not identified and strategies to preserve affordable housing does not exist.			

3.7 Project Comparison

Recent projects that have received FTA New Starts/Small Starts funding have also received at least a Medium rating under criteria for Land Use and Economic Development Effects. Several projects that recently received or are awaiting funding agreements from FTA are summarized here for comparison to Route 1. These projects have low or medium ratings for existing land use conditions, but were able to achieve a medium or medium-high economic development rating because of land use policies.

Table 3-14 offers a comparison of key elements of these selected projects with those same elements on the Route 1 corridor.

Table 3.14: Comparison - Selected Recent Projects under FTA New/Small Starts

Project	Miles/# stations	Service Type	Population Density (persons/sq. mile)	Employment (CBD or stations)	Overall FTA Rating	Current Project Phase
Route 1	14/12	Metro / BRT	4,280	27,000 (station areas)	TBD	Alternatives Analysis
National Capital Purple Line	16/21	LRT	9,200	154,000 (CBC)	Medium	New Starts Project Develop
West Eugene EmX extension	9/13	BRT	4,200	38,000 (CBC)	Medium	Small Starts Project Develop
South Sacramento LRT extension	4.3/4	LRT	5,100	105,000 (CBC)	Medium	Final Funding Agreement

National Capital Purple Line, MD (LRT)

Received “Medium” Land Use rating for New Starts

- Proposed 16 mile LRT line connecting Bethesda (Montgomery County, MD) and New Carrollton (Prince George’s County, MD) via Silver Spring and College Park
- Population density around proposed stations = 9,200 people per square mile
- Employment around proposed stations = 154,000 jobs
- Parking costs average \$10-\$15 per day in downtown Bethesda and \$8 per day in downtown Silver Spring
- Corridor includes stations dominated by strip commercial development, residential neighborhoods of single-family homes, townhouses, and intermittent high-rise apartment buildings
- Downtown Bethesda and Silver Spring are pedestrian-friendly; most other stations are automobile-oriented

Received “Medium-High” Economic Development rating

- Strong population and employment growth is projected in the corridor
- Montgomery County directs development to areas where public services are in place; Prince George’s County has designated the corridor for concentrated growth
- Zoning around downtown stations allows for dense transit-oriented development
- Land use policies have played a key role in redevelopment projects around Metrorail stations in Bethesda and Silver Spring

West Eugene EmX extension, Eugene OR (BRT)

Received “Low” Land Use rating for Small Starts

- Population density around proposed stations = 4,200 people per square mile
- Employment around proposed stations = 38,000 jobs
- Project will indirectly serve University of Oregon (20,000 students)
- Downtown Eugene is pedestrian-friendly and has street-fronting mixed-use buildings between two and four stories
- Rest of corridor includes mix of single-family homes and apartment complexes, big box commercial development, and industrial properties

Received “Medium” Economic Development rating

- Regional and municipal planning documents call for concentrated development in pedestrian-friendly “nodes”
- Planning specifically to support transit has not been conducted in the corridor outside of downtown
- Densities appear high for a small city; parking requirements outside downtown are low
- Limited evidence of development being shaped to support transit in the corridor

South Sacramento Extension (LRT)

Received “Low” Land Use rating for

- Extension of current LRT line from its current southern terminus through one of the fastest-growing areas of the Sacramento County
- Population density around proposed stations = 5,100 people per square mile
- Employment around proposed stations = 1,800 jobs
- Project provides direct connection to 105,000 jobs in the CBD
- Significant pockets of vacant land surround station areas
- Limited pedestrian connectivity to stations

Received “Medium” Economic Development rating

- Sacramento is beginning to implement policies to encourage infill development
- City zoning has provided for higher density development around stations
- Growth is occurring in the general vicinity of the existing South Sacramento Corridor line

4.0 Economic Development Analysis

4.1 Introduction

With increased rail transit or bus service along the Route 1 corridor, it will become increasingly possible for families and businesses to make location choices that minimize financial, environmental, and social costs. The stations will serve a variety of purposes, from daily commutes and regional business travel to occasional recreational trips. Over time, areas that are well served by transit will become nodes of residential and economic activity.

The purpose of this section is to assess the development impact of the economic activity that would be attracted to or newly built in the corridor under alternative growth scenarios. The work has several steps.

The first step is to assess the value of development already in place in the candidate station areas and the associated tax. The analysis relies on a careful evaluation of assessor's records collected from Fairfax and Prince William Counties.

The second step is to project the future economic development that would be in place according to adopted land use forecasts. This future state relies on MWCOG projections of anticipated growth in the corridor. These projections extrapolate existing trends into the future—thus they reflect the future economic development that would be anticipated even if transit investment were not made in the Route 1 corridor. The tax revenue associated with this commercial investment is calculated using current tax rates applied to the projected growth in development.

The third step projects the alternative development outcomes associated with significant transit investment in the corridor. Three scenarios (including the base case) were developed. The scenarios developed represent a range of potential development for the Route 1 corridor. Key outputs of the scenario analysis are the economic value associated with the development, and the associated change in tax revenues.

4.2 Current Economic Development Trends in the Route 1 Corridor

The total value of property in the Route 1 Corridor is about \$8.5 billion (\$2013), of which about three quarters or \$6.3 billion is taxable. This estimate is based on an analysis of assessed parcels located within a one-half mile radius of the thirteen station areas under consideration as part of the Route 1 alternatives analysis. The presence of Fort Belvoir in the corridor, which is an exempt property, accounts for the unusually large difference between the taxed and untaxed values.

The corridor has a heavy concentration of residential uses (comprised of multifamily and other residential types such as single family or townhouses, for example), consistent with its comparative

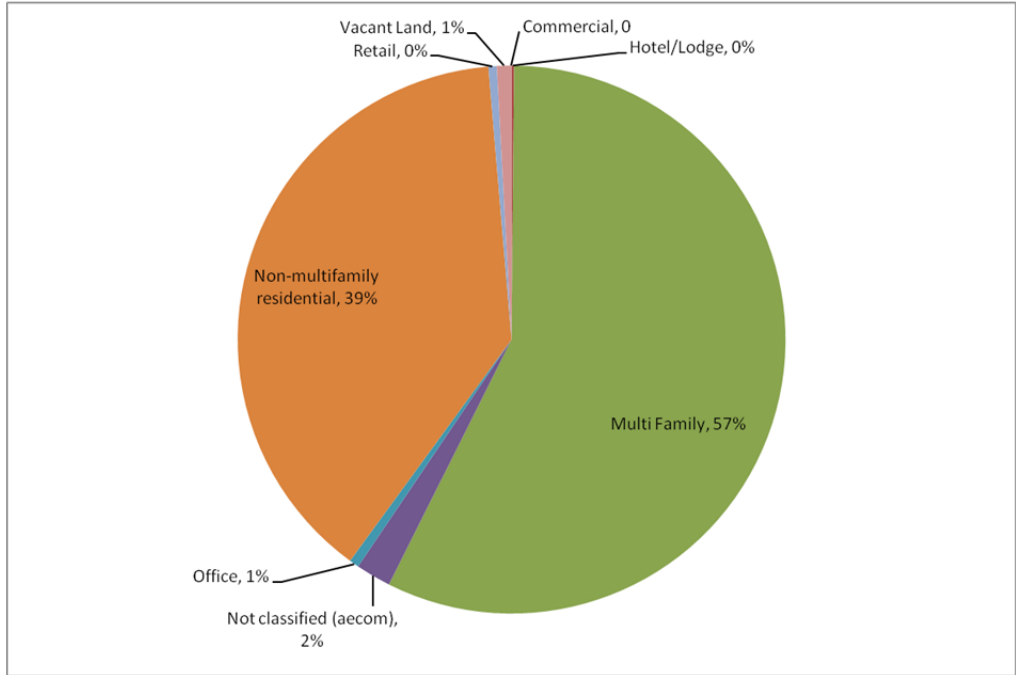
affordability within the larger Washington, DC metropolitan area¹⁷. Over 50% of taxable parcels are non-multifamily residential properties. Nearly 30% of taxable parcels are multifamily properties, comprising 60% of all residential properties. Offices (2%), retail (3%), and vacant land (1%) make up another 6% of taxable properties. Collectively, these uses account for over 86% of taxable properties in the corridor. The balance is made up of a diverse mix of hotel, entertainment, light industrial, and other taxable uses.

Taxable value varies significantly across station areas. The taxable value ranges from lows of \$28 million at Accotink Village, because of the presence of Fort Belvoir, to a high of over \$1 billion at Huntington. Penn Daw, Beacon, Mount Vernon, and South County Center all have taxable valuations between \$500 and \$600 million each.

The mix of uses varies across station areas too. For example, in the Huntington station area, 57% of taxable property is multifamily (see **Figure 4-1**). By contrast, in the Penn Daw station area, the dominant use is non-multifamily residential—accounting for 69% of taxable parcels (see **Figure 4-2**). There are also commercial parcels that account for 5% of the total parcels. None of the station areas has retail as the dominant use, but the Beacon area has a comparatively high 6% of its taxable properties in retail.

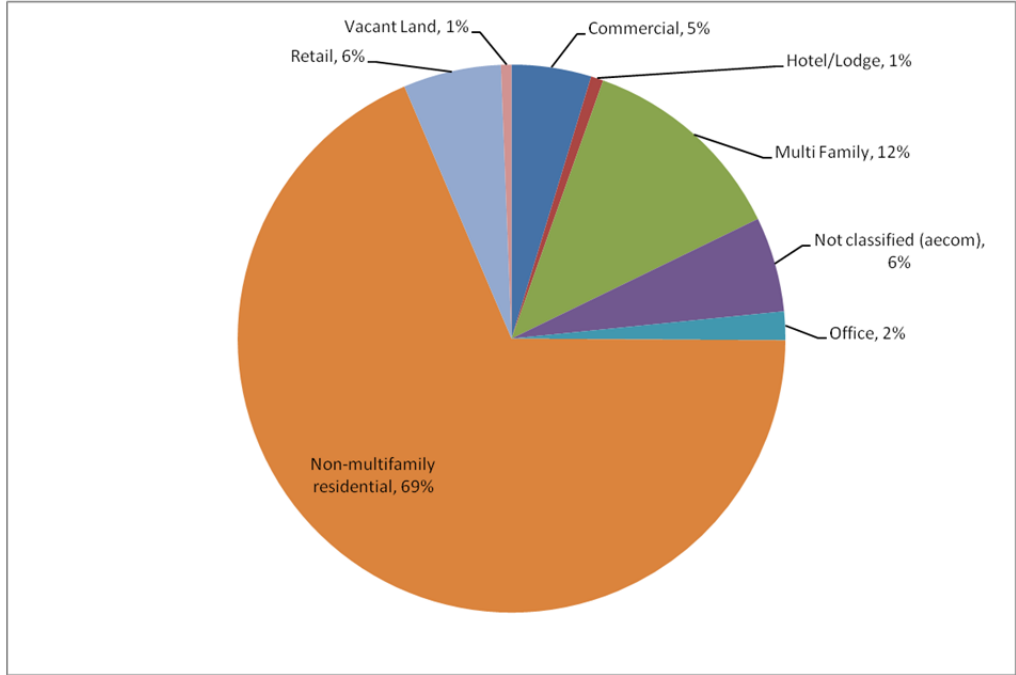
¹⁷ Residential housing comes in a variety of forms including single-family and townhomes (which may be owner occupied or rental) and multifamily for example. In the narrative, we have adopted the convention “multifamily and other residential types” to describe residential uses in order to distinguish between multifamily which is largely commercial real estate and other forms of residential (collectively described as non-multifamily residential) which are more heavily dominated by multiple owners and less commercial.

Figure 4-1: Share of Taxable Properties at Huntington Station



Source: AECOM Analysis

Figure 4-2: Share of Taxable Properties at Penn Daw Station



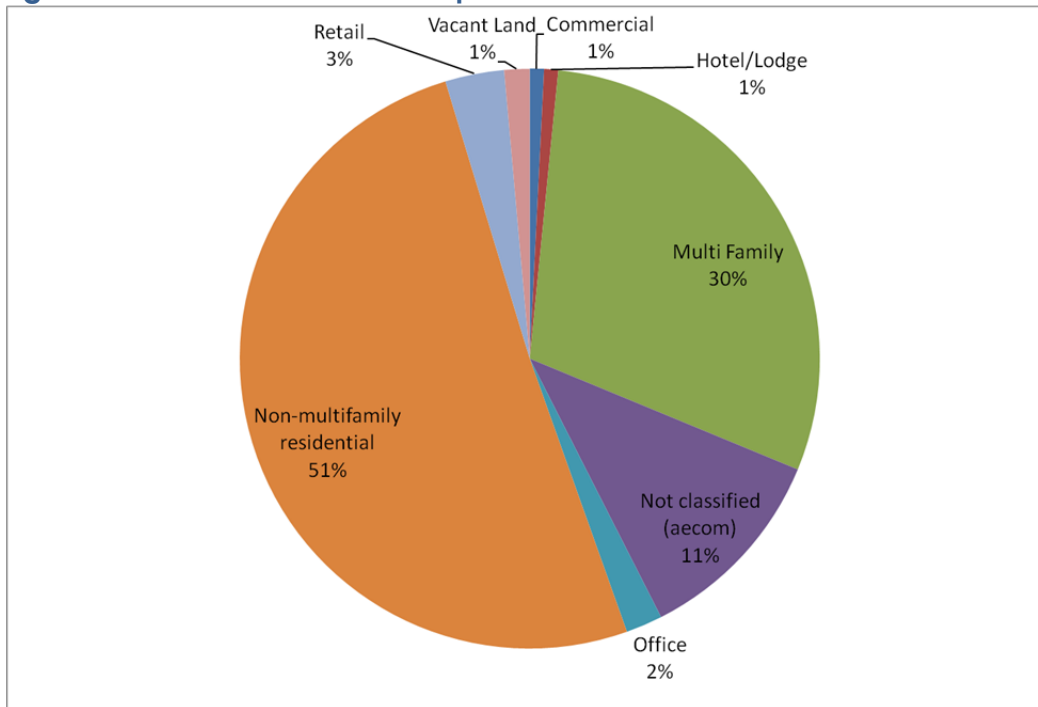
Source: AECOM Analysis

Figure 4-3 shows the share of all taxable properties across all 13 stations in the study area, and **Figure 4-4** shows the value of taxable properties. **Table 4-1** provides a summary of the 2013 parcel and assessment information for all the thirteen station areas combined. The summary table describes the land use, land value, improvement value, total value, square footage of the parcels by property type and by exempt and non-exempt tax status. Summaries for the individual station areas have been included at the end of the report. Where individual parcels fall within two overlapping station areas, the values associated with the overlapping parcels were divided evenly between the two overlapping station areas to ensure that there is no double counting in the valuation. The data are tabulations based on 2013 assessors' records collected from Fairfax and Prince William Counties. The high percentage of non-classified exempt properties in the table is due to the presence of Fort Belvoir, which is exempt and falls under the Accotink Village station buffer.

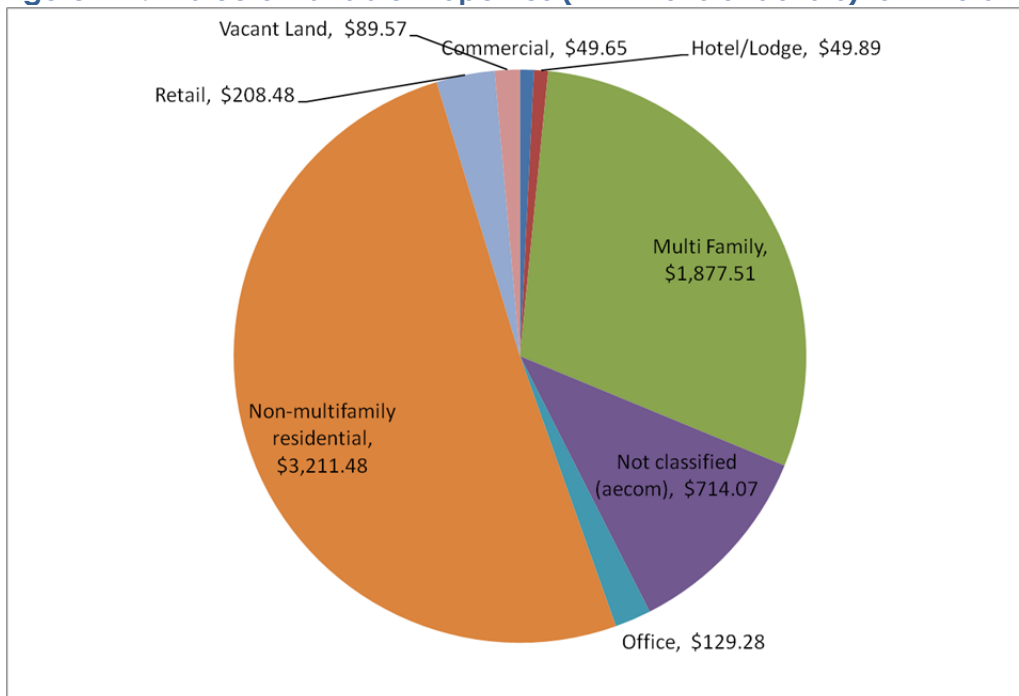
Table 4-1: Property Value and Square Footage Summary for all stations

Property Type	Tax Status	2013 Land Value	2013 Improvement Value	2013 Total Value	Area (Sq-Ft)	% of Sq-Ft
Commercial	non-exempt	20,101,790	29,546,720	49,648,510	1,179,691	0.16
Hotel/Lodge	non-exempt	17,239,370	32,651,790	49,891,160	1,281,398	0.17
Multi Family	exempt	4,167,000	11,149,240	15,316,240	688,451	0.09
Multi Family	non-exempt	415,663,040	1,461,850,090	1,877,513,130	90,523,909	12.10
Not classified	exempt	945,180,010	1,087,244,920	2,032,424,930	480,904,578	64.29
Not classified	non-exempt	273,740,530	440,333,050	714,073,580	46,399,383	6.20
Office	exempt	8,048,680	41,262,690	49,311,370	524,674	0.07
Office	non-exempt	42,266,440	87,012,740	129,279,180	3,933,857	0.53
Non-multifamily residential	exempt	9,643,850	18,697,120	28,340,970	1,012,406	0.14
Non-multifamily residential	non-exempt	1,140,776,480	2,070,707,100	3,211,483,580	71,159,063	9.51
Retail	exempt	654,480	423,730	1,078,210	40,844	0.01
Retail	non-exempt	112,107,530	96,372,210	208,479,740	7,305,111	0.98
Vacant Land	exempt	26,292,190	28,700	26,320,890	13,275,107	1.77
Vacant Land	non-exempt	89,098,450	469,560	89,568,010	29,780,437	3.98
Total (All)	exempt + non-exempt	3,104,979,840	5,377,749,660	8,482,729,500	748,008,909	100
Total (Taxable)	non-exempt	2,110,993,630	4,218,943,260	6,329,936,890	251,562,850	34

Source: AECOM Analysis

Figure 4-3: Share of Taxable Properties for All stations

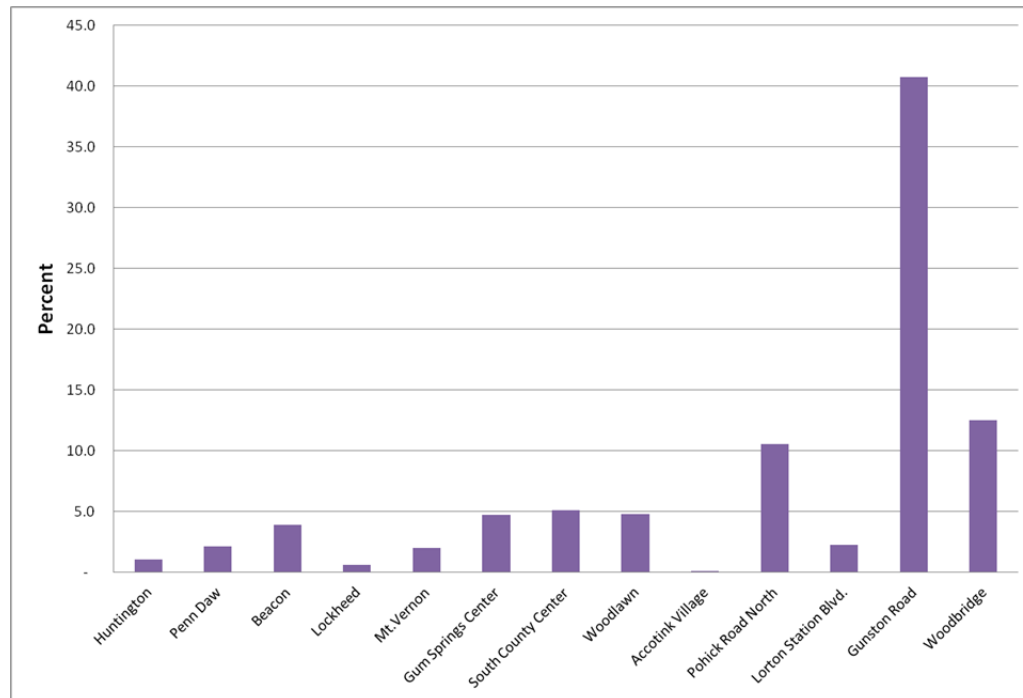
Source: AECOM Analysis

Figure 4-4: Value of Taxable Properties (in millions of dollars) for All Stations

Source: AECOM Analysis

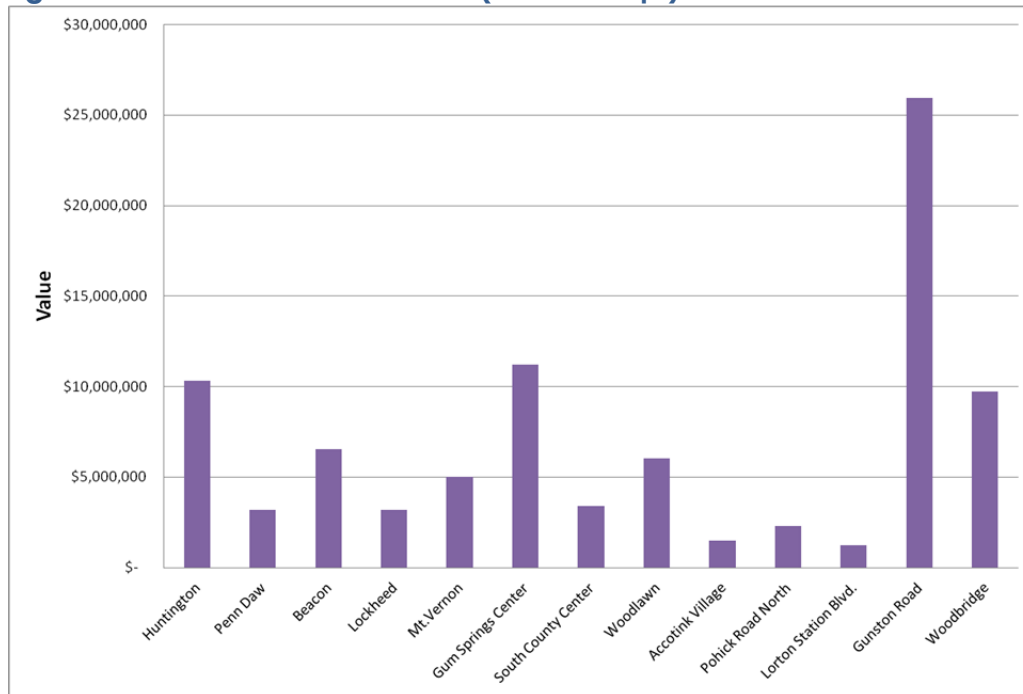
Figure 4-5 depicts the distribution of vacant land (non-exempt) by square footage across the station areas in the Route 1 corridor. About 40% of the square footage in the Gunston Road station area is vacant land (non-exempt)¹⁸. For Woodbridge and Pohick Road station areas, which have the next highest shares of vacant land (non-exempt), the percentages are 12.5% and 10.5% respectively. **Figure 4.6** shows the value of vacant land (non-exempt) across the station areas. The large quantity of vacant land influences the value of the tax base currently in place and also suggests that there may be greater ease of development or land assembly in these locations. Zoning and county plans, however, play a large role in the timing and ultimate shape of the development that occurs in the corridor.

Figure 4-5: Percentage of Square Feet of Vacant Land (Non-Exempt) Across Station Areas



Source: AECOM Analysis

¹⁸ The percentage of vacant land is an important initial screening factor in understanding development potential, but additional analysis is required to obtain the complete picture. For example, available vacant land can be offset by environmental constraints, unwillingness of owners to sell for redevelopment, or issues of topography, for example. In the case of the Gunston Road Station area, landfill and environmentally sensitive land contribute to the large share of vacant land, but would not foster development.

Figure 4.6: Value of Vacant Land (Non-Exempt) Across Station Areas

Source: AECOM Analysis

4.3 Methodology for Projecting Alternative Economic Development Outcomes

Based on the three land use scenarios developed for the Route 1 corridor, the value of anticipated development and the tax revenue for years between 2013 and 2035 were assessed. In order to predict land use impacts and related economic development impacts due to transit investment, a half-mile radius around potential station locations along the corridor was used for the analysis. The half-mile radius around a transit station largely represents the distance people are willing to walk to transit, and thus where significant transit-focused development is likely to occur.

Assessing the value of anticipated development associated with the land use scenarios, as well as the tax revenue for years between 2013 and 2035 involved the following steps.

Step 1 –Developing the Square Footage Projections

In this step, the anticipated square footage by property category for years between 2013 and 2035 was developed for the station areas along Route 1 corridor. Property types were aggregated into four categories: Total residential (includes single family, multifamily, and other forms of residential property), Office, Retail, and Other (includes commercial property as well as hotels and lodging). Both tax exempt and non-exempt properties within each of the above categories were included.

2013 Square Footage by Property Category

Square footage for the property categories corresponding to year 2013 was derived based on current parcel and assessment data from Fairfax County and Prince William County. This served as the starting point for the future year interpolations. **Table 4.2** shows the total square footage across all stations by property category for 2013.

Table 4.2: Total Square Footage by Property Type in 2013

Property Type	Square Footage
Total Residential(Single Family, Multifamily, and other forms of residential)	163,383,829
Office	4,458,531
Retail	7,345,955
Other (Commercial, Hotel& Lodging)	2,461,089

Source: AECOM Analysis

2035 Square Footage by Property Category

Square footage by property category corresponding to future year 2035 was developed based on the population and employment forecasts. The land use analysis provided the 2035 population and employment forecasts by station areas for each of the land use scenarios. The land use analysis also provided the 2010 population and employment estimates by station areas¹⁹. The growth in population and employment numbers between 2010 and 2035 was computed by station area for each of the land use scenarios.

Any growth in population within the station areas was translated to an increase in residential property square footage. Conversion of the growth in population to growth in property square footage was performed by using an assumed value for square footage per person corresponding to residential property. For this analysis, the square footage per person for residential property was assumed as 800²⁰.

¹⁹ 2010 Population and Employment estimates are based on 2010 COG 8.2 forecasts.

²⁰ Based on the median square footage per person corresponding to Residential property from the 2009 American Housing Survey (AHS), National Association of Home Builders (NAHB) Tabulations;

Similarly, any growth in employment within the station areas was translated to an increase in square footage for Office, Retail and Other property categories. Conversion of the growth in employment to growth in property square footage was performed by using an assumed value for square footage per worker corresponding to Office, Retail and Other property categories. The square footage per worker²¹ was assumed to be 250 for Office, 500 for Retail, and 1000 for Other.

By applying the aforementioned factors to the population and employment growth, estimates on growth in square footage by property category within each station area were derived. Square footage by property category corresponding to future year 2035, was computed by adding the derived growth in square footage to the 2013 square footage.

Interpolating Square Footage for Years between 2013 and 2035

The 2013 square footage and 2035 square footage served as the start and end points respectively for the intermediate year interpolations. The year-to-year interpolations between 2013 and 2035 were calculated with the assumption of linear growth between the starting year 2013 and the forecast year 2035.

Step 2 –Developing the Valuations

Value per square foot for each property category within the study area was derived based on 2013 assessment information. The 2013 Total Value (Land Value + Improvement Value) was divided by the 2013 square footage for each property category. Out of the thirteen station areas in consideration, twelve station areas fall within Fairfax County and one station area falls within Prince William County. An average value per square foot by property category was calculated based on data corresponding to station areas within Fairfax County. Value per square foot for the Woodbridge station area was calculated separately. This was done to aid in tax revenue calculations, as Woodbridge is the only station in Prince William County and thus has a different tax rate in comparison to station areas in Fairfax County. For the purpose of this analysis, the value per square foot was held constant over time, and does not account for inflation. In other words, the analysis results are not adjusted for inflation, and simply presented in 2013 dollars. This gives flexibility to the user of the analysis of value capture, allowing the user to scale the results according to their own assumptions on inflation rates. The projection in value reflects the change in total building stock constructed in the corridor. This is a conservative assumption as it is likely that at least some new construction in the corridor would be constructed in a higher valued manner over time. The working assumption is that this “upscaling” would likely happen over time but also unevenly across station locations. To the degree that this would take place, it represents a “high” scenario relative to the baseline growth projections developed here.

Source: <http://www.nahb.org/generic.aspx?genericContentID=171558&channelID=311>

²¹ Factors based on information on building area per employee by business type from various sources including Institute of Transportation Engineers, U.S. Department of Energy, and San Diego Association of Governments, Source: <http://www.usgbc.org/Docs/Archive/General/Docs4111.pdf>.

The square footage projections by property type within each station area between years 2013 and 2035 (from Step 1) were multiplied with the value per square foot to estimate the Total Valuations for 2013 – 2035.

Step 3 – Calculating Tax Yields

The tax yield for each year between 2013 and 2035 was calculated by multiplying the total value for the given year by the tax rate for each property type. For station areas in Fairfax County, a tax rate of 1.121²² (per \$100) was applied for residential property. A tax rate of 1.246²³ (per \$100) was applied for Office, Retail, and Other properties.

For station areas in Prince William County, tax rate of 1.2562²⁴ (per \$100) was applied to all property types. No transportation tax levy associated with the Prince William Parkway Transportation Improvement District was included in the tax yield calculations, as fiscal year 2015 may be the final year the district is needed before the general fund is fully reimbursed²⁵.

Steps 1, 2 and 3 described above were implemented for each of the three land use scenarios, resulting in assessed value of anticipated development, as well as the tax revenue for years between 2013 and 2035.

Validating Results

In order to validate the calculations and results, several checks were put in place. A ratio between total value for Scenario Two to the total value of Scenario One was calculated for each year (between 2013 and 2035), for each of the four property categories, as well as all categories put together. This allowed for a better understanding in the outcomes of Scenario Two in comparison to Scenario One. To ensure that the tax yield was calculated properly, total tax revenue was divided by the total value to obtain the tax rate, and the results were checked against the tax rates that were applied in these calculations.

4.4 Results/Findings

Scenario One showed a growth in overall property values from \$5.6 billion in 2013 to about \$6.4 billion in 2035. During that period, value for residential property grew from \$5.1 billion to \$5.78 billion. Office property value grew from \$178.6 million to \$265 million. Value of retail property grew from \$209.6 million to \$260 million. Other property increased from \$99.5 million to \$125.3 million. Each property

²² Based on tax rates/fees for Mt. Vernon District in Fairfax County. Residential Property tax rate was calculated to include General + Leaf Collection + Pest Infestation + Stormwater = 1.121 (per \$100); Source: Fairfax county Real Estate tax rate and Fee table; http://www.fairfaxcounty.gov/dta/pdf_files/2013_tax_fee_table.pdf

²³ Based on tax rates/fees for Mt. Vernon District in Fairfax County. Residential Property tax rate was calculated to include General + Leaf Collection + Pest Infestation + Stormwater + Transportation = 1.246 (per \$100); Source: Fairfax county Real Estate tax rate and Fee table; http://www.fairfaxcounty.gov/dta/pdf_files/2013_tax_fee_table.pdf

²⁴ Based on tax rates/fees for Prince William County. Property tax rate was calculated to include Base + Fire and Rescue Levies + Gypsy Moth Levy = 1.2562 (per \$100); Source: <http://www.pwcgov.org/government/dept/finance/pages/tax-rates.aspx>

²⁵ Source: <http://eservice.pwcgov.org/documents/bocs/agendas/2014/0225/13-B.pdf>

type's value as a share of total value largely remained unchanged between 2013 and 2035, with residential property slightly declining from 91% to 90%, office growing from 3% to 4%, retail remaining at 4%, and other remaining at 2%. Total annual tax revenue showed a growth from \$63.9 million in 2013 to \$73.4 million in 2035.

Scenario Two showed a growth in overall property values from \$5.6 billion in 2013 to about \$6.8 billion in 2035. During that period, value for residential property grew from \$5.1 billion to \$5.87 billion. Office property value grew from \$178.6 million to \$398.1 million. Value of retail property grew from \$209.6 million to \$365.8 million. Other property increased from \$99.5 million to \$139.2 million. Residential property's share of total value declined slightly from 91% to 87%. Office property's share went from 3% to 6%, retail property went from 4% to 5%, and other remained at 2%. Total annual tax revenue showed a growth from \$63.9 million in 2013 to \$77.6 million in 2035. While residential property's share declined in this scenario, the tax base grew more than in Scenario One because office, retail and other property types are all taxed at a higher rate than residential property types.

When comparing Scenario One and Scenario Two, 15% to 25% additional growth in population and employment in Scenario Two does not result in comparable additional growth in property values. The additional property value growth for all four property types in Scenario Two is about 5%. This can be attributed to the allocation of growth in population and employment (combined) across stations according to County Comprehensive Plans, which does not necessarily translate to 15% - 25% overall growth because the base employment is currently small compared to the population. Overall share in employment makes up a much smaller portion of combined growth than the growth in population, affecting the overall growth. Population and employment growth in Scenario Two (in comparison to Scenario One) translates to about 5% growth in square footage across all property categories. Thus, when compared to Scenario One, the additional property value growth in Scenario Two is 5%.

The FEIS for the Dulles Corridor Rapid Transit Project (p. 5-22) reports potential increases in Corridor developments summarized below for the full LPA:

- Office - 17%
- Retail - 18%
- Industrial - 1%
- Residential - 10%
- Total - 12%

Scenario Three showed a growth in property values from \$5.6 billion in 2013 to about \$10 billion in 2035. During that period, value for residential property grew from \$5.1 billion to nearly \$8.1 billion. Office property value grew from \$178.6 million to \$840.6 million. Value of retail property grew from \$209.6 million to \$463.5 million. Other property grew from \$99.5 million to \$642.1 million. Residential property's share of total value declined from 91% to 81%. Office property's share grew from 3% to 8%, retail's share grew from 4% to 5%, and other property's share grew from 2% to 6%. Total annual tax revenue showed a growth from \$63.9 million in 2013 to \$115.6 million in 2035. As with Scenario Two, residential property's share declined, but Scenario Three yielded higher tax revenues than Scenario One

because office, retail, and other property types are all taxed at a higher rate than residential property types. This scenario is illustrative of what would be needed to reach the density required to support a hybrid of BRT and Metrorail; it is not a market driven scenario.

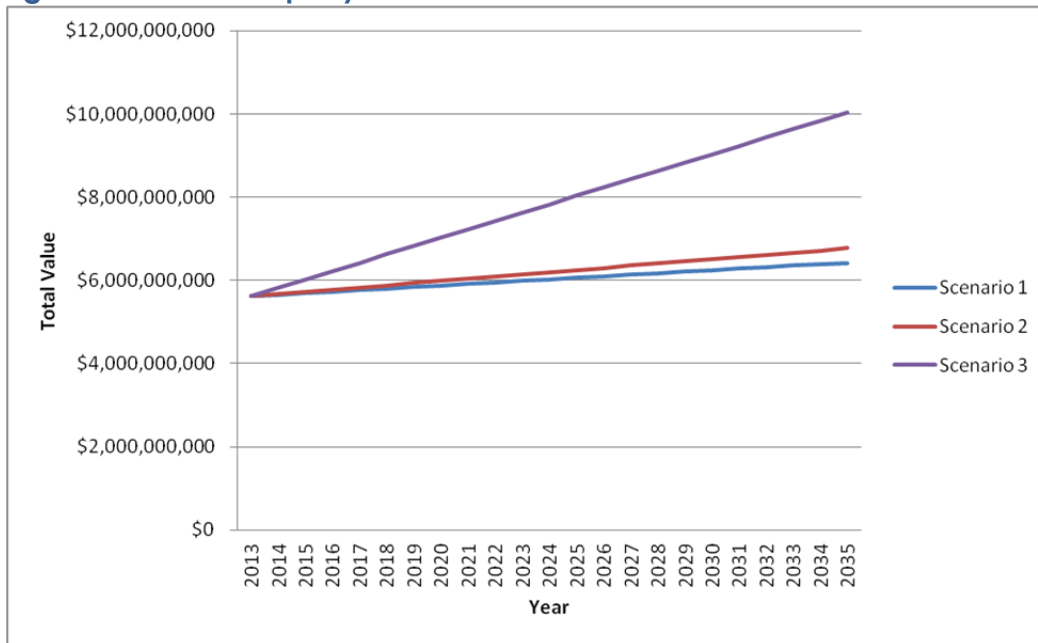
When comparing Scenario Three and Scenario One, we see that Scenario Three results in additional growth in total property value of 56.2% over Scenario One. This is significantly larger than the additional growth in Scenario Two because Scenario Three assumes activity density along the corridor to be between 35 and 70 (population plus employment per acre), which corresponds to the density supportive of the BRT and Metrorail combination proposed under this scenario.

Figure 4-7 demonstrates the growth in total property value from 2013 to 2035 for the three scenarios.

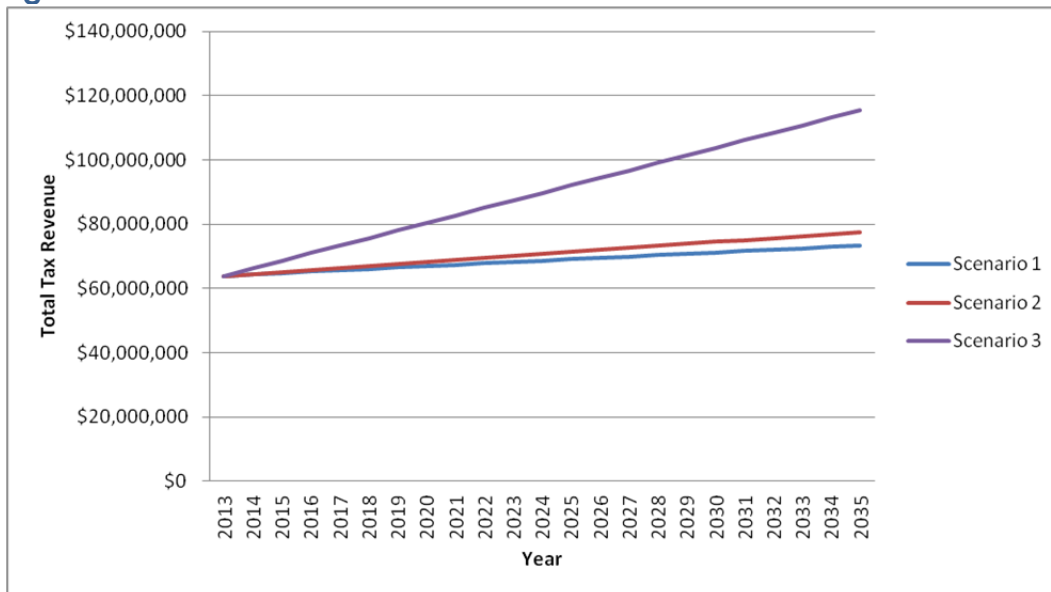
Figure 4-8 demonstrates the growth in tax revenue from 2013 to 2035 for the three scenarios.

Table 4-3 shows the total value in 2013 and 2035 for the three scenarios.

Table 4-4 shows total annual tax revenue in 2013, 2035, as well as the cumulative tax revenue between 2013 and 2035 for all three scenarios.

Figure 4-7: Total Property Values for 2013-2035

Source: AECOM Analysis

Figure 4-8: Total Annual Tax Revenue for 2013-2035

Source: AECOM Analysis

Table 4-3: Total Valuation in 2013 and 2035

Scenario	2013	2035
Scenario One	\$5,620,342,090	\$6,424,383,573
Total Residential(Single Family, Multifamily, and other forms of residential)	\$5,132,653,920	\$5,773,422,725
Office	\$178,590,550	\$265,074,868
Retail	\$209,557,950	\$260,626,362
Other (Commercial, Hotel& Lodging)	\$99,539,670	\$125,259,617
Scenario Two	\$5,620,342,090	\$6,772,862,626
Total Residential(Single Family, Multifamily, and other forms of residential)	\$5,132,653,920	\$5,869,762,455
Office	\$178,590,550	\$398,142,701
Retail	\$209,557,950	\$365,781,655
Other (Commercial, Hotel& Lodging)	\$99,539,670	\$139,175,816
Scenario Three	\$5,620,342,090	\$10,033,529,156
Total Residential (Single Family, Multifamily, and other forms of residential)	\$5,132,653,920	\$8,087,321,590
Office	\$178,590,550	\$840,626,977
Retail	\$209,557,950	\$463,463,966
Other (Commercial, Hotel& Lodging)	\$99,539,670	\$642,116,623

Source: AECOM Analysis

Note: The analysis does not factor in any assumed changes in quality of development in station areas.

Table 4-4: Total Annual Tax Revenue in 2013 and 2035

Scenario	2013	2035	2013-2035 Cumulative Revenue
Scenario One	\$63,964,281	\$73,370,076	\$1,579,345,109
Total Residential(Single Family, Multifamily, and other forms of residential))	\$57,879,598	\$65,248,605	\$1,415,974,333
Office	\$2,228,537	\$3,306,519	\$63,653,146
Retail	\$2,614,686	\$3,251,414	\$67,460,145
Other (Commercial, Hotel& Lodging)	\$1,241,460	\$1,563,539	\$32,257,485
Scenario Two	\$63,964,281	\$77,615,698	\$1,628,169,762
Total Residential(Single Family, Multifamily, and other forms of residential)	\$57,879,598	\$66,350,204	\$1,428,642,725
Office	\$2,228,537	\$4,964,925	\$82,724,810
Retail	\$2,614,686	\$4,562,056	\$82,532,534
Other (Commercial, Hotel& Lodging)	\$1,241,460	\$1,738,513	\$34,269,693
Scenario Three	\$63,964,281	\$115,557,741	\$2,064,503,259
Total Residential(Single Family, Multifamily, and other forms of residential)	\$57,879,598	\$91,292,817	\$1,715,482,774
Office	\$2,228,537	\$10,479,432	\$146,141,648
Retail	\$2,614,686	\$5,779,270	\$96,530,494
Other (Commercial, Hotel& Lodging)	\$1,241,460	\$8,006,222	\$106,348,343

Source: AECOM Analysis

Note: A tax rate of 1.121 (per \$100) was applied for residential property in Fairfax County, a tax rate of 1.246 (per \$100) was applied for Office, Retail, and Other properties in Fairfax County, and a tax rate of 1.2562 (per \$100) was applied to all property types in Prince William County.

The economic analysis shows that there is significant land value in the corridor. However, the assumptions of higher growth in commercial uses over the analysis period, combined with the fact that the mix of uses still leans heavily towards residential, has the result of limiting the amount of tax revenue being generated by new development in each of the scenarios. Future analysis would assess the potential of transportation and other public investments to increase land value in the corridor and thus increase the estimated tax revenues.

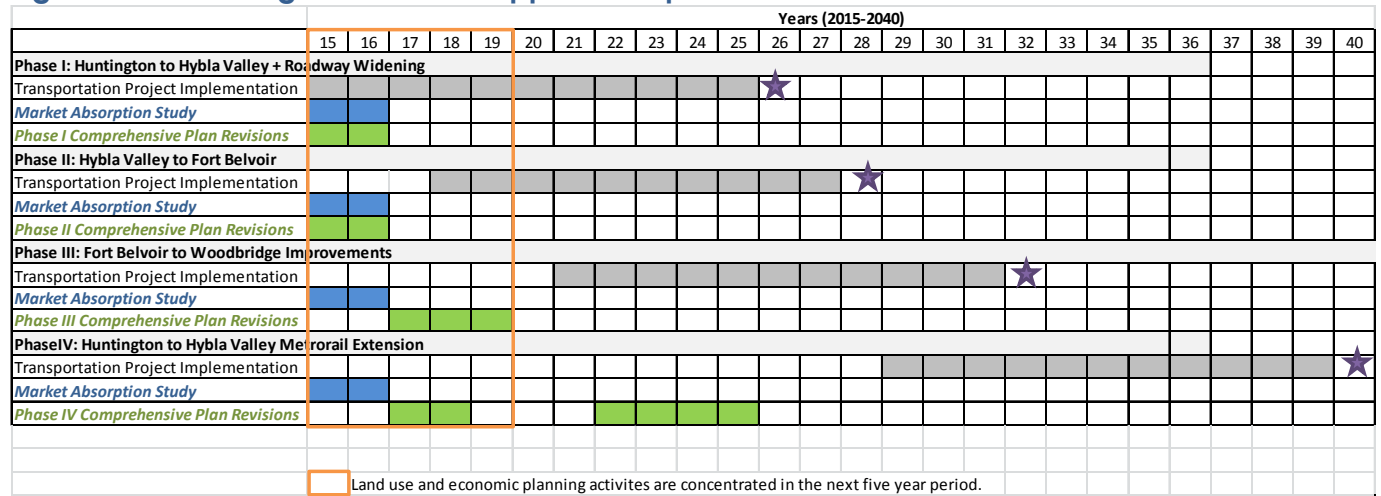
5.0 Recommendations

An integrated vision for the Route 1 corridor will guide actions to maximize economic development potential by creating a range of housing and commercial opportunities within the corridor. These actions will be taken in step with transportation infrastructure and services to achieve the maximum benefit of private and public investments. This vision will emerge in part through planned station areas that incorporate commercial space and a diversity of housing types within dynamic mixed-use centers, connected by the multimodal corridor and a walkable secondary street network. This section describes five strategies—or sequential steps—to achieve this transportation/land use vision:

1. Conduct a market absorption study
2. Shape a planning and economic development strategy
3. Codify policies and regulations
4. Create incentives, and
5. Attract major catalyst development

Fairfax and Prince William Counties have already created strong plans and guidelines for growth in key activity centers (called Community Business Centers and Urban Mixed Use Areas respectively) on the Route 1 corridor. The recommendations in this section build on the principles articulated in the County Comprehensive Plans, and leverage the recommended transportation investment as a mechanism to implement the Plans.

A successful federal funding application depends upon how well the *principles* of land use and economic development plans are reflected in the form of *adopted policy* and *development response*. These recommendations are not specific to a particular transit mode for Route 1, but instead reflect the design principles and policies that create high quality transit-supportive development for all transit modes and meet FTA project justification criteria. As shown in **Figure 5-1**, updates to the Comprehensive Plans would occur in phases, to support growth and development related to the proposed phased implementation of transportation improvements.

Figure 5-1: Planning Activities to Support Transportation Recommendations

5.1 Recommendation #1: Market Absorption Study

The existing Comprehensive Plans have been structured around potential development scenarios, and look beyond the adopted 2035 forecasts for population and employment growth. The important immediate next step in follow-up to the current Multimodal Alternatives Analysis is a closer look at economic trends and market forces that will shape development in the near-term and longer-term future.

The purpose of the market study is, in large part, to predict the future—or at least a range of future land use and development scenarios in each station area. This exercise should not be a traditional, value-neutral real estate market analysis, which merely extrapolates from existing market trends, but a combination of quantitative market analysis techniques and the more qualitative TOD planning and policy framework developed to support transit implementation. The objective is to identify future land use and development scenarios that are desirable from a TOD and Smart Growth standpoint and feasible from a development standpoint.

Anticipated outcomes of the market absorption study are:

- Perspectives on the pace and location of anticipated private development and redevelopment
- A clearer understanding of where the opportunities are for focused planning
- Input to policy decisions around potential incentives and strategic investments

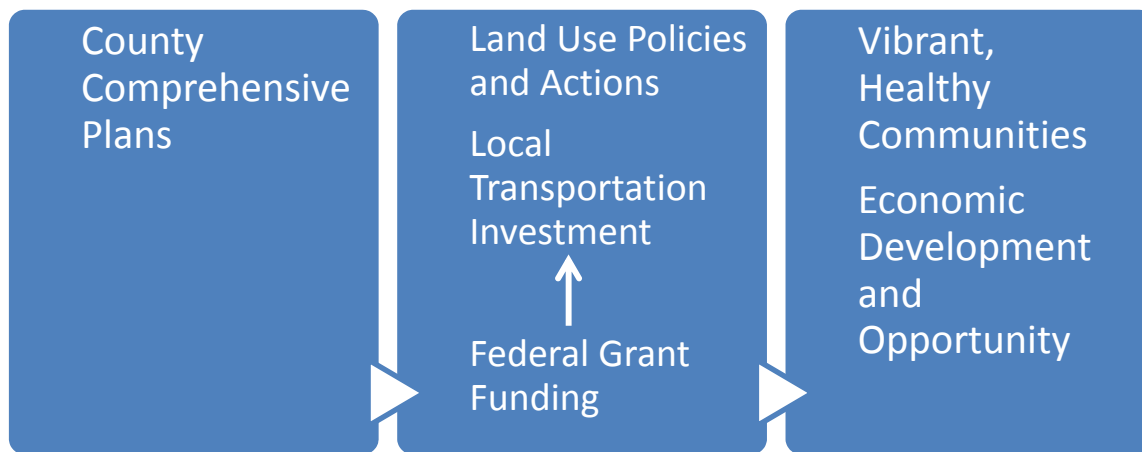
The process for the market absorption study should include participation by a cross-section of corridor interests from the private and public sectors. The goal is to create a baseline for discussions of where and when to prioritize investment.

5.2 Recommendation #2: Planning and Economic Development Strategy

Fairfax County and Prince William County have adopted Comprehensive Plans that help set the groundwork for focused transportation investment. These plans should be revisited in light of the Locally Preferred Alternative for transit and transportation, and they should be coordinated with efforts to attract added levels of employment and population growth for the Route 1 corridor. The relationships are depicted in **Figure 5-2**.

Updated plans will focus on the public infrastructure and services to support higher levels of population and employment. Comprehensive Plans will document the need for schools, public safety, parks, and other critical public investments.

Figure 5-2: Relationship of Land Use Planning, Transportation Investment, and Economic Development



A key finding of the Route 1 study is the need for enhancements to the local street network. The maps in **Figure 5-3** show a vision for a future network of local streets that would have lower speeds and accommodate on-street bicycle facilities. The concept shows a connection between the Huntington Station Area and South County Center, along the west side of Route 1. It is intended as an alternative to Route 1 for local travelers between the station areas and should be part of a larger plan for a connected system of walkable streets, supporting access to transit stops and generating a framework for transit-related development along the entire corridor.

Specific Recommendations for Planning:

- Prepare station area plans for all proposed stations to encompass, at minimum, the full half-mile radius around each proposed station:

- Ensure transit-supportive density, diversity of housing and commercial development, and high quality design in new mixed-use development
 - Define centers for the Lorton and Fort Belvoir station areas
- Prepare plans for investment in public infrastructure and services (schools, public safety, parks, etc.)
 - Prepare a detailed needs assessment, including a hierarchy of investment priorities
 - Identify locations for priority investment and prepare an implementation plan
- Create a street connectivity vision for the entire corridor
 - Identify a parallel secondary street network to Route 1
 - Establish an interconnecting grid of streets around each station, emphasizing a hierarchy of walkable local streets
 - Accommodate bicycle facilities in the street designs
- Adopt the station area plans, public services plans, and street connectivity vision as part of the comprehensive plans for Fairfax and Prince William Counties

5.3 Recommendation #3: Policies and Regulations

The effort to codify policies and regulations is an important step in implementing plans. Without well-defined rules, developers cannot assess the risks or potential return on their investments in the corridor. Well-articulated standards create a sense of place that serves to attract further development and build momentum toward realization of plans.

Urban Design Guidelines

Prince William County has recently created a set of design guidelines for Potomac Communities to establish the design intent for the North Woodbridge area. Fairfax County has urban design recommendations for the Richmond Highway Corridor and design guidelines to augment the Comprehensive Plan for Tyson's Corner. Guidelines for the Route 1 corridor would provide specific standards for the appearance, character, and arrangement of elements, including buildings, streets, sidewalks, street furniture, planting, lighting, and open space.

Since many jurisdictions in Virginia do not rezone as a method for directing development, urban design guidelines are especially important to indicate the counties' intentions for development intensity and quality. FTA normally uses transit-supportive zoning regulations as a key criterion under its Economic Effectiveness rating.

Parking

Parking policy and standards must be addressed throughout the corridor. At present, readily accessible and free parking is a dominant land use along Route 1. Shared parking should be permitted and parking management districts explored, e.g. Hybla Valley district, instead of on a site-by-site basis, to reduce individual parcel development costs, optimize land use and development intensity, and encourage the development of walkable, "park once" areas. Parking located behind commercial and residential buildings allow pedestrian access to building front entrances and can minimize curb cuts improving

access management and traffic flow on the corridor main line. Newer developments at the north end of the corridor have proposed less parking than required by code; this practice could be codified as a matter of right allowance for transit-oriented projects, further reducing barriers to the type of quality development that would support and enable a significant transit investment.

The Fairfax County Guidelines for Transit-Oriented Development list a number of ways to reduce the need for parking, including maximum parking requirements, shared use parking facilities, carpooling, metered parking, car-sharing programs, neighborhood parking programs, and other techniques.

Affordable Housing

The northern section of Route 1 has a high proportion of affordable housing units, compared to Fairfax County as a whole. Current FTA criteria compare the ratio of affordable to total housing units within the corridor to that for the entire county. This measure—currently almost 4:1—should achieve a “High” rating for Route 1 under FTA’s affordable housing criteria. During the funding application process, FTA may look to see that the counties have policies in place to maintain the current level of affordability in market-rate station area development. Fairfax County has a stated goal of 12 percent affordable/workforce housing, which is now being implemented for new projects within the Route 1 corridor. Prince William County does not currently have policies to maintain or grow affordable housing levels in the study area as new development occurs.

Specific Recommendations for Policies / Regulations:

- Refine and adopt Route 1 urban design guidelines:
 - Establish appropriate streetscape standards: street and sidewalk widths, building setbacks, street trees, street furniture, and lighting
 - Ensure active street level building design: building form, façade penetration, ground floor interface, and entrances on the front street/sidewalk
- Adopt parking policies:
 - Locate parking on-street or behind buildings, and create parallel parking on secondary street networks (between sidewalks and through traffic)
 - Establish parking policies for the Route 1 corridor that focus on parking maximums, shared-parking and other methods as outlined in the Fairfax County TOD Guidelines
- Develop and enforce affordable and workforce housing policies:
 - Protect current levels of affordable housing
 - Ensure that affordable housing is included as part of market-rate development

5.4 Recommendation #4: Incentives

A carefully crafted system of incentives that encourages denser, mixed-use development at transit stations will facilitate transit plan implementation. Incentives could include density bonuses for high quality mixed-use projects, tax rebates, grant and loan funds for commercial projects that incorporate quality mixed use, and continuance of incentives for affordable housing.

Fairfax County already has a system of incentives for its revitalization areas, including the Route 1 corridor, known as the Commercial Revitalization District (CRD) zoning overlay. The Fairfax County Office of Community Revitalization (OCR) uses the CRD to prioritize and incentivize development within the CBCs. The policies are designed to expedite development review and offer flexibility for infill development. This could be extended to the transit station areas in order to provide increased flexibility and streamlining for transit-supportive development and/or construction of transit facilities.

A well-coordinated, clear and timely plan review and approval process is another method for incentivizing mixed-use transit-oriented development. Fairfax and Prince William Counties could formalize corridor proffer requirements for transit-oriented development projects, so that developers know what to expect at the early stages of the development process. The counties should consider other methods for making the approval process for transit-oriented development more predictable and efficient for developers.

Specific Recommendations for Incentives:

- Offer density bonuses, tax rebates and loan funds for transit-supportive development that provide a greater incentive than what is already offered through the Richmond Highway CRD zoning overlay
- Streamline approvals to provide a greater incentive for transit-area development

5.5 Recommendation #5: A Major Catalyst Development

Introduction of a major new catalyst development on or near Route 1 is a key strategy for spurring a significant increase in development that could support a high quality transit investment on the corridor. The Inova Mount Vernon Hospital and the expansions at Fort Belvoir provided further economic attraction for the corridor. An additional, successful major investment could continue this trend and could establish a model for the corridor.

Accomplishing this strategy would require concerted action by Fairfax County and Prince William County leadership. This recommendation should relate to the proposed Market Absorption Study (Recommendation #1) but is proactive; it does not wait for the market to respond but rather incentivizes investment at key locations along the corridor.

The strategy would encompass the use of a range of incentives to attract and locate large employers or concentrations of retail firms at key points along the corridor. It would likely identify target sites for potential employers and active land assembly.

The result of initial actions would be to define centers of economic activity. Over the longer term, other development would follow, reinforcing the planned centers and creating the sense of place articulated in the County Comprehensive Plans and the Route 1 Multimodal Alternatives Analysis.

Figure 5.3: Alternate Parallel Route (Illustrative purposes only)



(For Illustrative Purposes Only)

ALTERNATE PARALLEL ROUTE FRAMEWORK CONCEPT

DRAFT**KEY**

- EXISTING Street
- CONCEPT Street
- ↔ Alternate Parallel Route
- Transit Station
- Transit Station 1/2 Mile Radius

5-6-14

Rhodeside & Harwell

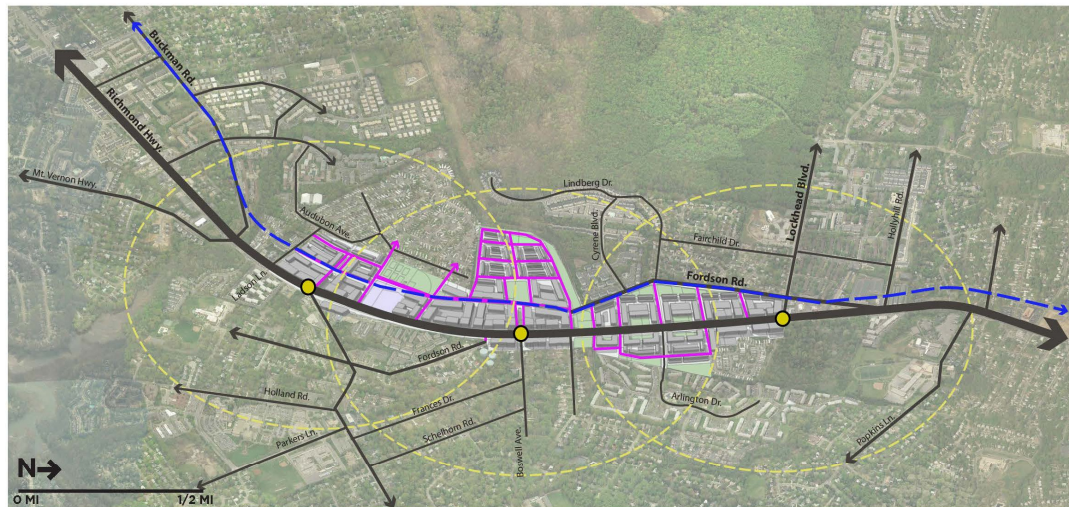
Route 1
Multimodal Alternatives Analysis



Existing Street Network

KEY

— EXISTING Street

Conceptual Street Network
(For Illustrative Purposes Only)**KEY**

— EXISTING Street

— CONCEPT Street

↔ Alternate Parallel Route

● Transit Station

--- Transit Station 1/2 Mile Radius

HYBLA VALLEY STREET CONNECTIVITY FRAMEWORK CONCEPT

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Route 1
Multimodal Alternatives Analysis