Final Report - June, 2012

Prince George's County Transitway Systems Planning Study

Prince George's County, Maryland

Prepared for the:

Prince George's County Planning Department, M-NCPPC

Prince George's County Department of Public Works and Transportation

With funding from:

National Capitol Region Transportation Planning Board

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1. INTRODUCTION

This report provides an initial framework for the development of a transitway system within Prince George's County, Maryland. This report is funded through the National Capital Region Transportation Planning Board's Transportation/Land-Use Connection (TLC) program. This study serves as an initial analysis of a transitway network and aims to lay the foundation for future analysis. The focus has been on the development and subsequent application of a tool for the rapid evaluation and comparison of corridors for future investment in high-quality transit service. It provides a high-level, long-term vision for the transit system in the county with the understanding that there are many unanswered questions, including better understanding of future ridership, costs, land use change, and travel time savings and other benefits. Moreover, because of the timeline of the project, it did not allow for a broad review of the recommended system so it is anticipated that final rankings and priorities of the County may change.

This project had its genesis in the County's Transit Service Operations Plan (TSOP) and Master Plan of Transportation (MPOT). Both identified a need for new as well as improved transit service within the county to address both mobility needs and to counteract growing roadway congestion. The County's General Plan identifies a number of areas for Transit Oriented Development (TOD). There is also a need to improve transit to many growing regional attractors such as National Harbor and Konterra. While the MPOT identified several corridors for future transit improvements, it was not able to evaluate them or compare them in a regional context to develop a comprehensive transitway system. The goal of this project is to lay the groundwork for such a plan.

There are many aspects of the county which lend themselves to support high-quality, high-frequency transit. The county, according to the 2010 Census, exceeds 863,000 persons. Although, area-wise, much of the county is agricultural land or set aside for preservation, most of the population lives in the Developed Tier where density is quite high in places, particularly in the vicinity of Metro stations. Over 17 percent of County residents are estimated to take transit to work. Approximately 10 percent of all households do not have a vehicle available to them. Overall, the county is relatively affluent with a median household income of over $71,000 in 2010 and just 5 percent of families living at or below the poverty line (for the United States as a whole, these numbers were roughly $52,000 and almost 14 percent, respectively). In addition, many residents from Charles and Anne Arundel Counties travel to or through the County en route to employment and recreation in the District or elsewhere in the DC region. Figure 1.1 provides a map of the county in regional context.

This project involved three key components: 1) a review and summary of existing transit and transit-related plans for the County and adjacent jurisdictions; 2) a series of workshops inviting regional transit providers and other stakeholders to share current transit planning efforts and provide feedback on the results of this study; and 3) the development of the corridor evaluation tool and subsequent prioritization of transitway corridors in the county.

The approach developed for this study is aimed at developing a comprehensive picture of the relative merits of transitways within the County while recognizing the complex nature of the task. There are three primary transit operators in the county (WMATA, The Bus, and the MTA) offering a range of bus and rail services across hundreds of routes. Existing transit routes are shown in Fiture 1.2. Selecting data to ensure relative completeness as well as a reasonable level of comparability poses a challenge from the outset. Subsequently tailoring the data for a GIS-based analysis provides a further challenge.

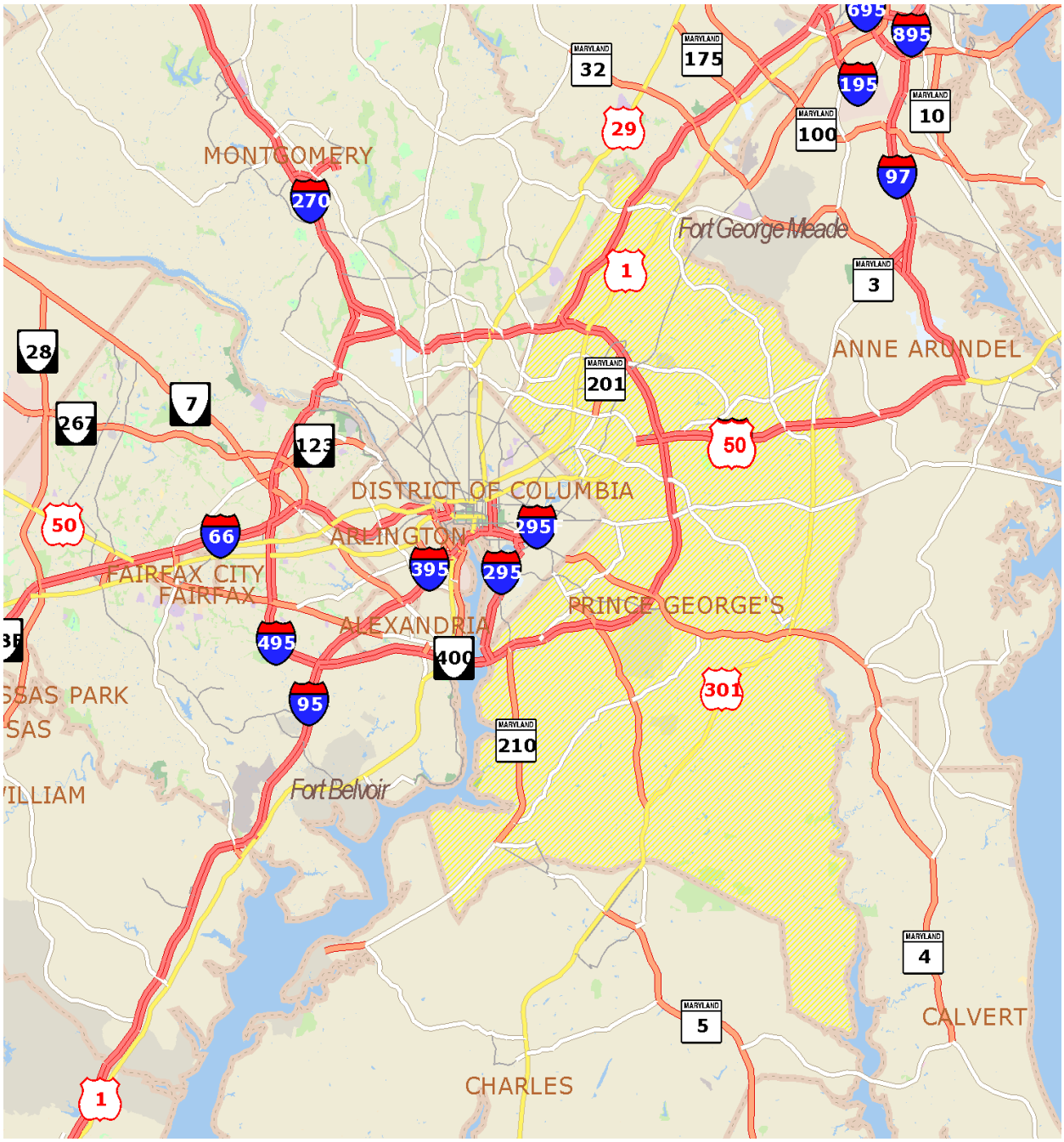


Figure 1.1: Study Area Context

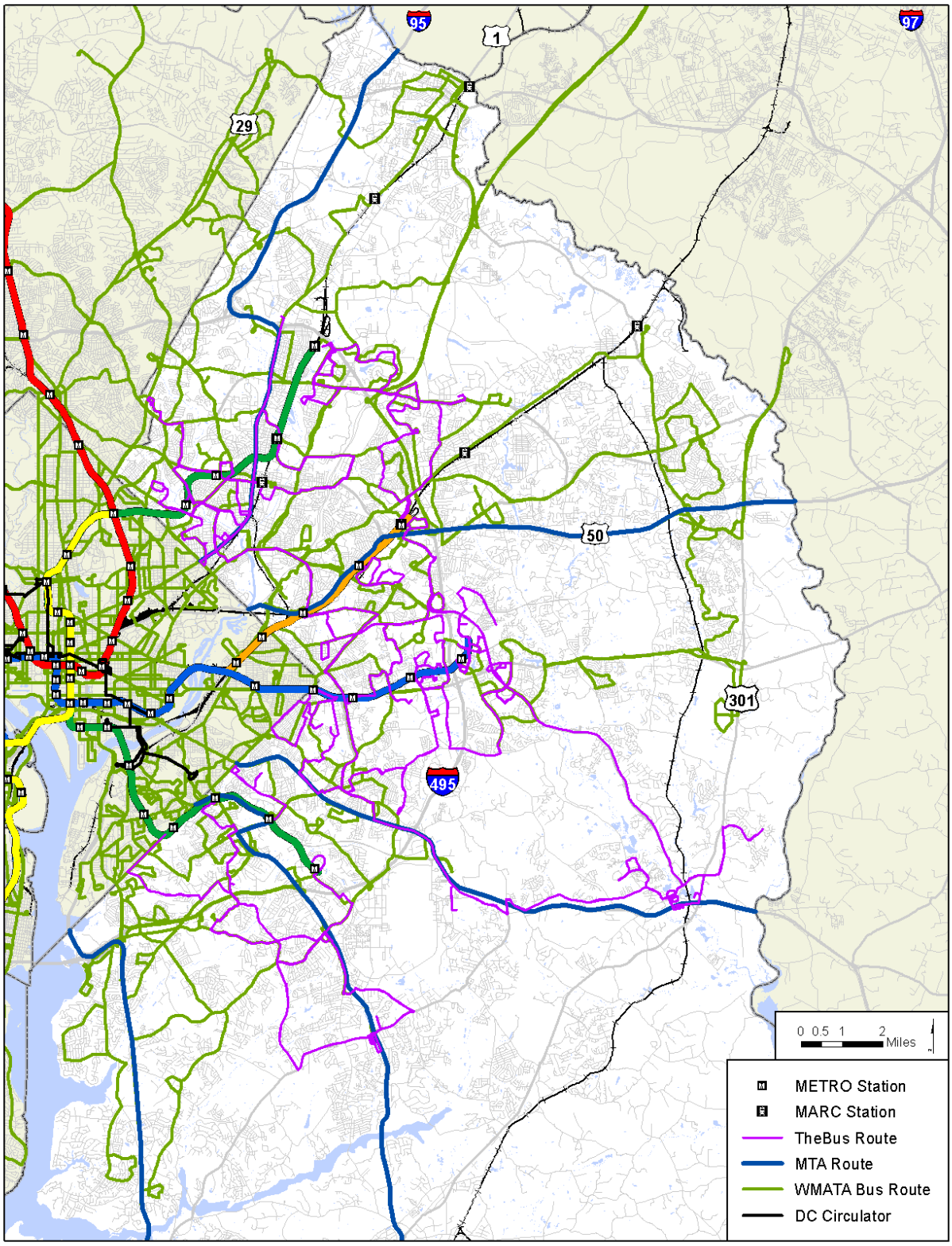


Figure 1.2 Existing Transit Routes

2. SUMMARY OF CURRENT TRANSIT PLANNING EFFORTS

As part of this study, M/A/B conducted a review of current plans for improved transit service in and adjacent to the County. While some of the plans have been around for many years, others are still under development. The efforts reviewed are summarized below. For each effort we provide a summary of the current status, reports reviewed and an overview of the planned elements and their relationship to the current effort.

1. Prince George's County Transit Service Operations Plan (TSOP) and Master Plan of Transportation (MPOT)
2. WMATA Priority Corridor Network (PCN)
3. WMATA Regional Transit System Plan (RTSP)
4. DC Streetcar Initiative
5. Montgomery County BRT
6. Woodrow Wilson Bridge crossing
7. Southern Maryland/MD 5 transit

2.1. Prince George's County TSOP & MPOT

The Prince George's County TSOP and MPOT provide a short and long-range plan for transit in the county. The current TSOP was completed in 2008 and provides a five year plan for substantial improvement to transit service in the County. It covers expanded service span, increased frequency and improved coverage for both TheBus and WMATA bus routes. The primary focus is providing a higher quality transit experience by improving the service standards and coverage of transit in the county.

The MPOT was completed in 2009 and covers all forms of transportation in the county. It provides a comprehensive vision for transportation within the county that includes increased emphasis on TOD and improved pedestrian and bicycle access and circulation. The plan defines the transit service quality envisioned for each development tier as well as along key corridors. It outlines potential fixed-guideway transit corridors as well as key TOD investment nodes.[1] The corridors include:

- the Purple Line LPA from New Carrollton to Bethesda
- an extension of the Purple Line through Largo Town Center to National Harbor and extending or connecting to transit over the Woodrow Wilson Bridge
- an extension of the Green Line north to Fort Meade or BWI airport
- transit along MD 5 south from Branch Avenue to Waldorf
- transit along US 50 from New Carrollton to Bowie Town Center
- transit from National Harbor south along MD 210 to Charles County

Aside from the initial Purple Line segment, these transitways are all in the early planning stages. The proposed transit along MD 5 has completed a conceptual alignment study complete with right-of-way analysis. The other corridors have had relatively little study and will be considered in further detail as part of this project.

[1] These nodes were developed as part of the 2002 General Plan.

2.2. WMATA PCN Network

The priority corridor network (PCN) is an effort by WMATA to provide targeted improvements along 24 key bus corridors ultimately developing a network of high quality bus routes. The targeted improvements cover routes that currently carry roughly half of the Metrobus ridership (though less than one sixth of the lines). By focusing on streamlining operations and stops along with operational improvements such as transit signal priority and exclusive lanes, the PCN program aims to improve travel times and reliability of the routes. These, together with other improvements such as transfer facilities, park and ride improvements and new buses will improve the overall traveler experience and develop a unique brand within the WMATA bus service. While WMATA has stopped short of calling the service Bus Rapid Transit (BRT), many of the improvements and service parameters mimic BRT and several of the corridors have been referred to as BRT in TIGER grant applications.

Metro has established key characteristics for the PCN service including service span, frequency, productivity targets and overall route design. Among these include at least 10 minute headways during the weekday peak hour and no more than 15 minutes during the off-peak. Weekend standards are slightly lower and range from 15 minutes during Saturday peak hour service to 30 minutes during Sunday off-peak. All priority corridors should include express/limited stop service during the peak.

In all, 24 corridors were identified, seven of which are within Prince George's County in whole or in part. These include:

- University Boulevard/East-West Highway: J1, J2, J3, J4
- New Hampshire Avenue: K6
- Greenbelt – Twinbrook: C2, C4
- Eastover – Addison Road Metro: P12
- East-West Highway: F4, F6
- Rhode Island Avenue Metro to Laurel: 80s
- Southern Ave Metro – National Harbor: NH1

The first corridor evaluations began in 2003 and have continued at a steady pace. The studies are generally in line with the schedule laid out in 2008 and should complete in the next year or two. Implementation of recommended improvements is subject to funding, though Metro's goal is to implement study recommendations within roughly a year of study completion, recognizing that capital improvements may take several years. In particular, roadway and traffic signal priority improvements may be time-consuming, as they will require coordination with and efforts by local jurisdictions and other agencies.

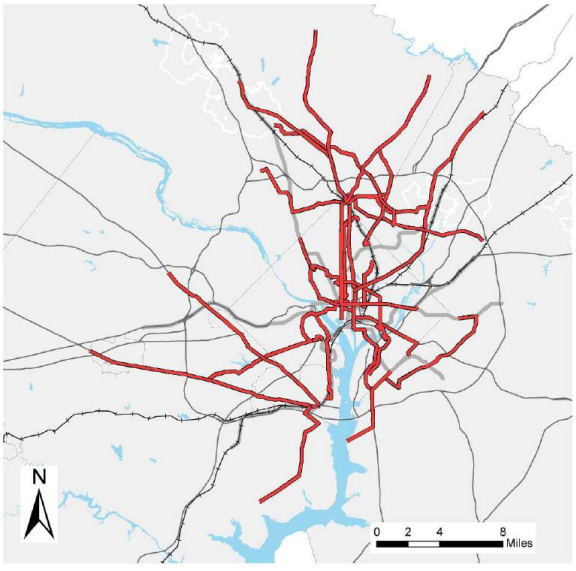


Figure 2.1: Priority Corridor Network source: WMATA

In addition to the corridor level evaluations, the PCN concept has been studied at the network level. This study, completed in 2010, evaluated

system ridership and other measures of effectiveness based on the current PCN plans as well as other transit improvements in the regional constrained long range plan (CLRP). The analysis showed that ridership on the PCN routes would be roughly twice that of the no-build alternative in 2030 without exclusive lanes and an additional 30 percent higher with exclusive lanes. The study also estimated that in 2030, the total travel time savings in the corridors would exceed 9,000 hours on a typical day.[2] Overall, transit ridership within the PCN corridors under the PCN build scenarios would increase by roughly 25 percent over the no-build in 2030. Region-wide, this translates to an increase in transit trips of 3 to 4 percent.

2.3. WMATA RTSP

The WMATA regional transit system plan (RTSP) is a long-range operator-neutral transit plan for the region. It generally assumes the PCN network as a baseline in addition to other transit projects in the CLRP. The plan builds on the TPB Transportation Vision from 1998 and the more recent Region Forward plan from MWCOG. Both focus on improved mobility in the region and recognize that with the anticipated population growth transit will be a key component of the region's mobility. Region Forward also includes many sustainability and livability goals which rely on transit.

In addition to the regional vision, the RTSP will attempt to address the following fundamental issues in the region's transportation system:

- Metrorail will be at capacity in the core even with the use of all 8-car trains
- Several Metrorail stations are at or will be at capacity, particularly the major transfer stations
- Surface streets are increasingly congested, slowing buses
- Park and ride demand will greatly outstrip capacity as usage grows yet the cost of expanding this capacity is prohibitive
- Many of the new transit initiatives in the region are led by local jurisdictions which could lead to poorly integrated facilities and missed opportunities for improved regional mobility
- Activity centers, particularly those in the suburbs, will see tremendous growth yet few are well-served today
- Operations and maintenance (O&M) costs are expected to grow faster than ridership and will place an increased strain on Metro's, and the region's, finances, particularly given the anticipated capital costs associated with system expansion and lack of dedicated funding streams

The RTSP will attempt to address all of these issues but is still some time from completion. Much of the early work has focused on potential expansions of the Metrorail system, both in the core and to various regional activity centers. It also focuses on expanding surface transit to support demand. WMATA has evaluated a number of alternatives including the following which have the largest bearing on transit in Prince George's County:

- A "PCN+" network which includes Montgomery County and Northern Virginia BRT networks and commuter rail enhancements in addition to other improvements to the PCN network

[2] Total savings included transit travelers' savings as well as decreased travel time for auto drivers.

- A streetcar network including the entire proposed DC network, and the Columbia Pike and Crystal City streetcar lines
- An expanded light rail network including an extended Purple line from New Carrolton to King Street as well as a spur from Takoma Langley to White Oak and the Corridor Cities Transitway (CCT)
- A new realigned Blue Line via M street and either New Jersey or Constitution Avenues;
- A Beltway Line which would include eight new stops in Prince George's County and connect to four existing stations
- A number of extensions including the Orange Line to Bowie, the Green Line to Charles County and also to BWI. A separate run included extensions of the Blue Line to US 301 and a Green Line spur to National Harbor
- Scenarios examining modified land use, improved walkability and parking capacity relief

Other scenarios less-directly affecting Prince George's County include new Yellow Lines through downtown, a realigned Silver Line, a new Brown Line from Cherry Hill through Downtown to Friendship Heights, and various interline alternatives. One element noticeably lacking in the alternatives was substantial improvement of the surface transit in Prince George's County, something this study will address.

While each alternative addresses some of the issues above, it will require a combination to solve the complete problem. Given the costs associated with many of the options, it is unlikely that there will be a solution any time soon without a substantially different funding climate or funding sources.

The analysis of individual strategies is largely complete at this point. WMATA is currently working on Phase II of the RTSP, which combines the various strategies into scenarios for testing. A final version of the RTSP is expected in the fall of 2012.

2.4. DC Streetcar Initiative

The current streetcar initiative has its genesis to transit improvement studies of the late 1990s which identified a need for improved cross-town transit. In 2003 DDOT began the DC Transit Future System Plan and Alternatives Analysis which ultimately identified 14 corridors for improved transit operations including BRT and streetcar or LRT. The study has been updated several times, most recently in 2010. In the most recent plan, eight streetcar lines have been identified which have been broken into three phases. Additionally, DDOT has prepared the DC Streetcar System Plan which provides more detail on the implementation and design of the system, particularly for the initial segments, and includes details such as vehicles, maintenance facilities, power supply, turnarounds and service span and other operational considerations.

The initial phase has kicked off with the H Street/Benning Road streetcar project. This segment was selected in part because of the high bus ridership in the corridor. Additionally, H Street was in need of reconstruction so, in cooperation with the DC Great Streets Initiative, the District elected to include the tracks in the reconstruction in addition to other amenities such as improved sidewalks.

In all Phase 1 would consist of four distinct lines and would be complete by 2015. Phase 2 would extend or construct several new lines, so that by the end of 2018 there would be six lines in service. By 2020, Phase 3 would be complete and include all eight lines. The current plans call for all lines to stop short of the DC–Maryland boundary but there has been some discussion about extending one

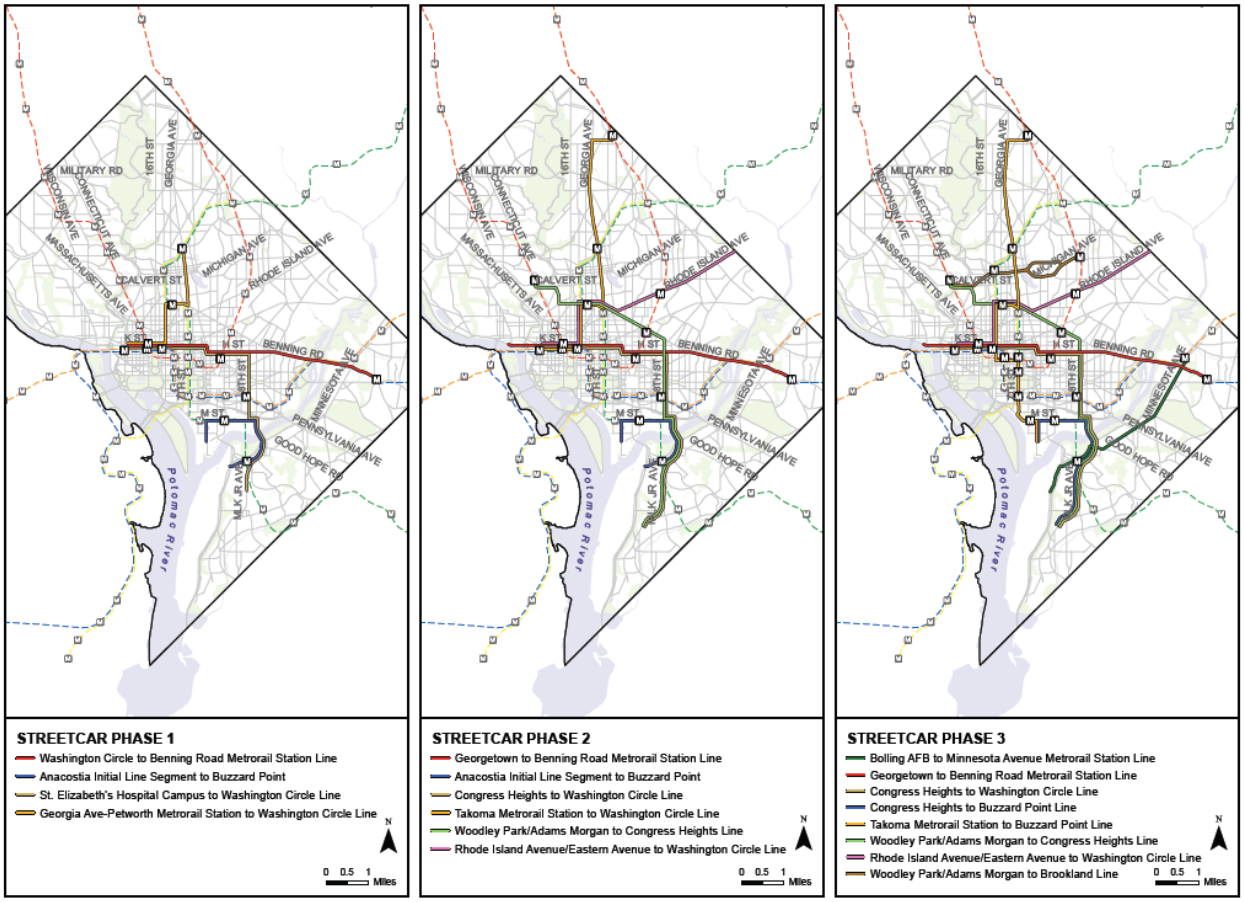


Figure 2.2: DC Streetcar Plan source: DC Transit Future System Plan, 2010

or more lines into Maryland. These were not pursued initially in order to speed early planning efforts and simplify funding. The most logical extension into Prince George's County would be the Rhode Island Avenue line. An extension south from Congress Heights to National Harbor would largely mimic the Green Line spur explored in the RTSP. The Benning Road line could be extended but the logical route – along Central Avenue – would generally duplicate the existing Blue Line service.

DDOT has proposed a mix of internal funding, TIGER grant funds and GO bonds for the initial H Street/Benning Road and Anacostia segments. Additional funding for future segments would come primarily from a mix of local CIP funds, FTA Small Starts and value capture of property and parking tax revenue resulting from new and redevelopment along the streetcar lines. The total construction costs are estimated at $1.5 billion in 2009 dollars.

2.5. *Montgomery County BRT*

In a relatively short time frame, Montgomery County has developed a draft plan for a comprehensive Bus Rapid Transit (BRT) network to span the county. Largely spearheaded by Councilmember Mark Elrich starting in late 2008, a feasibility study was completed in 2011 outlining ridership estimates and costs for the proposed 150 mile system.

Of the initially examined 23 routes, 16 were selected for further study based on four criteria:

- Existing bus ridership
- Future BRT-supportive land use within ½ mile of the corridor

- Major activity centers
- Regional transit connectivity

While the proposed network would substantially improve mobility and connectivity within the county, most corridors would be entirely contained within the county and provide little opportunity for direct extension south or east.

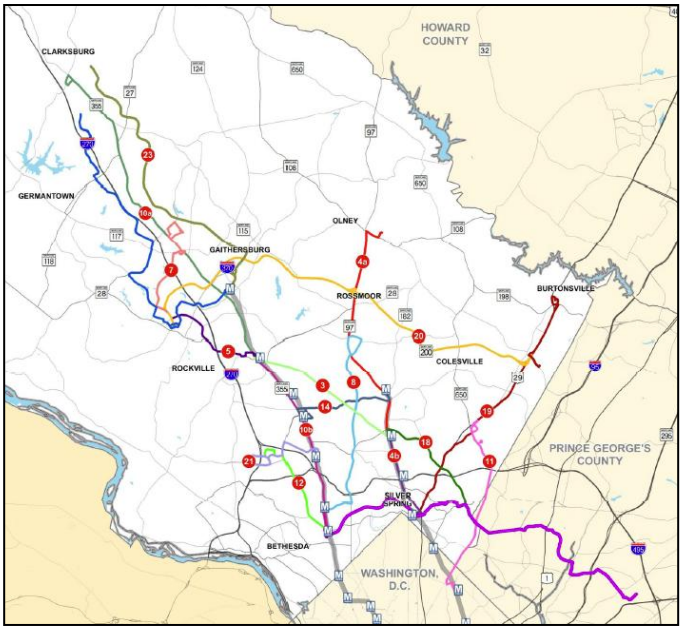


Figure 2.3: Proposed Montgomery County BRT Network
source: Countywide Bus Rapid Transit Study

There are a few corridors which could be coordinated with other efforts. Most relevant to this study is the New Hampshire Avenue corridor which would extend from Fort Totten to White Oak. Additionally, the University Boulevard route could be extended to the east from Takoma-Langley. The ICC route could easily extend to Konterra and Muirkirk. Lastly, a new route in Prince George's county could readily connect to the US 29 route at White Oak, Cherry Hill, Briggs Cheney or Burtonsville.

The total cost of construction was estimated at $2.3 to $2.5 billion in 2010 dollars though that does not include utilities or right-of-way costs. This equates to roughly $16-17 million per mile, a very economical system. It is estimated to generate 52,000 new linked transit trips attracting a total of 92,000 linked trips per day. O&M cost per boarding was estimated to range from as little as $1.19 to $4.64; the ICC route had a much higher O&M cost per boarding of $10.74 to $12.88 as a result of its low ridership. Overall the farebox recovery ratio was estimated between 26 and 33 percent.

In May, 2012, the County Executive's Transit Task Force issued their final report, which primarily focuses on the BRT network. While their recommendations are similar to those proposed in the Countywide BRT Study, the task force recommended the addition of 7 segments covering an additional 14 miles for a total system size of just over 160 miles. They estimate that the total cost would be just over $1.8 billion in current year dollars.

2.6. Woodrow Wilson Bridge Crossing

As part of the reconstruction of the Woodrow Wilson Bridge, in addition to the ten general purpose lanes, two additional lanes were constructed for use by transit and HOV. While the design will accommodate either striped HOV/transit lanes or exclusive bus or rail lanes, the decision for the use was not made as part of the design and construction project. Several studies have been completed

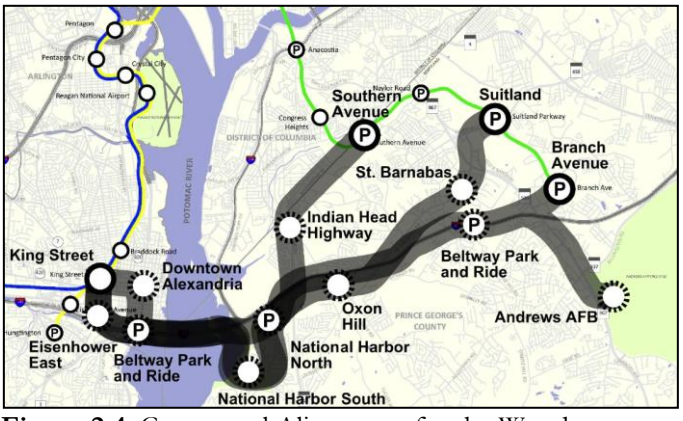


Figure 2.4: Conceptual Alignments for the Woodrow Wilson Bridge Transit Crossing source: MDOT/MTA

evaluating the potential uses of the lanes, including Phases 1 and 2 of the Capital Beltway South Side Mobility Study which was completed in 2009.

More recently, the MTA and MDOT are leading the Capital Beltway South Side Transit Study which is examining potential transit connections across the Woodrow Wilson Bridge using the 11th and 12th lanes. The study is examining a range of technologies – including buses in mixed traffic, BRT/LRT and Metrorail – and multiple alignments connecting Alexandria with the Green Line in western Prince George's County by way of National Harbor. Initial evaluation of the alternatives was scheduled to be complete by January, 2012, with the study complete in May.

2.7. Southern Maryland/MD 5 Transit

For many years, various planners and officials have expressed interest in extending transit along Maryland Route 5 into southern Prince George's County and northern Charles County, terminating at Waldorf or La Plata. The initial concept was simply an extension of the Green Line. Transit in the corridor has been the subject of a number of studies resulting in fairly detailed conceptual plans.

Given the rapid growth in Charles and Southern Prince George's County, and the resulting congestion along US 301 and MD 5, transit along the MD 5 corridor has been under consideration for some time. Studies evaluating various transit concepts date to the 1990s and have been regularly revised and refined since. The 2004 MD 5/US 301 Transit Service Staging Plan evaluated a range of service from the existing commuter bus service to light rail. Based on ridership and costs, it recommended continued growth of commuter bus for at least ten years with a reevaluation of demand and cost-effectiveness between 2015 and 2020 to consider implementation of BRT or LRT.

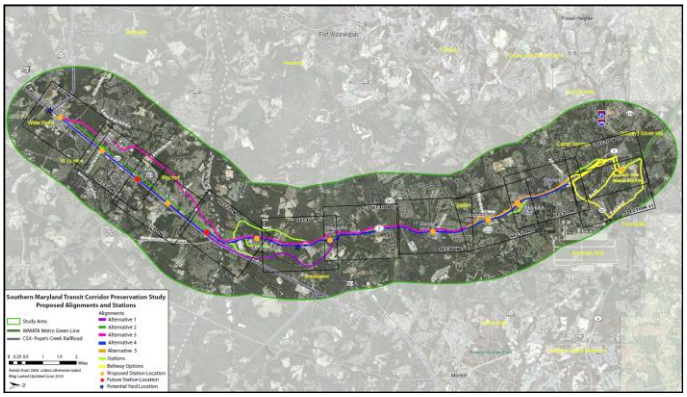


Figure 2.5: Alignments considered in the SMTCPS

In 2010, the MTA completed the Southern Maryland Transit Corridor Preservation Study (SMTCPS) which evaluated a number of potential alignments along the corridor and selected a preferred alignment from White Plains to the Branch Avenue terminus of the Green Line. It estimated the construction costs at $1.0 billion for BRT and $1.4 billion for LRT (in 2009 dollars). The aim of the study was to identify an alignment so that it could be preserved in local land use plans.

While the current timeline is uncertain, there is generally strong support, particularly in Charles County where congestion along US 301 and MD 5 is problematic and many of the commuter buses and park and ride lots are at or near capacity. The transit line is also seen as the centerpiece for the redevelopment of Waldorf as envisioned in the recently completed Waldorf Urban Design Study. Charles County is currently working with the MTA to begin the process of an Alternatives Analysis.

3. REGIONAL STAKEHOLDER WORKSHOPS

A key component of this study was a series of regional stakeholder workshops. Originally envisioned as a charrette, it expanded into a regional forum for discussing transit systems planning. Participants included representatives from several Maryland counties, the District and Northern Virginia as well WMATA and Maryland and Virginia state agencies. These meetings were a first of their kind for the region.

The first meeting was held on March 10, 2012 at MWCOG. The primary focus was a roundtable update of transit systems planning in the region and included discussion of projects in Montgomery, Charles, Anne Arundel, Arlington and Fairfax Counties, Alexandria, and the District in addition to current planning efforts in Prince George's County. The MTA, DRPT and WMATA also discussed their current efforts. The initial phase of this study, the corridor identification, was discussed with participants. In addition to feedback on the study, a key outcome of the meeting was the scheduling of subsequent one-on-one meetings between Prince George's County and neighboring jurisdictions to more fully discuss their transit planning efforts.

The second workshop was held on June 13, also at MWCOG. Attendance was similar to the first workshop and the meeting began with a roundtable of updates on regional transit planning efforts. The remainder of the discussion focused on the corridor evaluation methodology. This included both factors and weights and how this experience related to those of neighboring jurisdictions.

A key outcome of the workshops was a desire by the participants to continue the meetings and expand them to include participants from the entire Metropolitan Washington Region. The suggestion is for a once or twice annual forum to discuss transit systems planning issues. Despite the several transit-related fora and committees, participants felt that there is not a group that discusses transit planning in the region at the systems level.

4. CORRIDOR IDENTIFICATION & EVALUATION

The core effort of this study was the corridor identification and evaluation. While the County's MPOT identifies several fixed-guideway corridors, it was not able to evaluate them or consider them at a systems level. This task consisted of, first, identifying corridors that could make up a comprehensive transitway network and, second, evaluating those corridors. The evaluation resulted in an initial prioritization. While it is recognized that this may not be the final priority for the corridors, for a variety of reasons, the goal of the study was to provide a solid foundation for subsequent analysis and final prioritization.

4.1. Corridor Identification

An important step in the development of the transitway plan is the selection of potential corridors that will be analyzed in the subsequent phase of the project. As the subsequent phase involves more detailed quantitative analysis, this selection step was a process of engineering judgment based on both quantitative and qualitative factors.

Quantitative Factors

In identifying corridors three sets of quantitative data formed the basis for the analysis:

1. Future employment and household densities

2. Existing bus route productivity
3. Future roadway level of service

Future Employment and Household Densities

There is a long-identified relationship between density – of employment and households – and transit productivity. With increasing density, there are both more attractors and generators and typically a reduced reliance on the private auto as parking availability tends to decrease. The relationship, however, is much more complex than simply density of use so there are few guidelines equating overall density with transit success as most tools and analysis ultimately focus on ridership. TCRP 100 suggests a minimum density of roughly 3 households per acre or 4 jobs per acre to support transit. The recently completed Montgomery County BRT Study suggests 5 households or 6 employees per acre as BRT supportive.[3] Given that the goal of this study is the identification of higher-level service corridors – versus simply transit-supportive –, the Montgomery County standards seem reasonable and have the benefit of allowing for some consistency between this study and that of the neighboring jurisdiction with which there may eventually be interconnection. The mapped data is 2040 Round 8 forecast household and employment totals at the traffic analysis zone (TAZ) level.

Existing Bus Route Productivity

One of the classic metrics of bus-route productivity – and indicators of a need for higher-quality service – is ridership per day. For this study, while we have total ridership by route and line, we do not have ridership at the route segment level as would be necessary to identify ridership levels within individual corridors. A reasonable surrogate, and also important metric of productivity in its own right, is ridership per mile. By normalizing route ridership over its length, we can add riders from overlapping routes and achieve an overall estimate of transit demand at the segment level. This gives a reasonable graphical estimate of the total existing transit demand within a corridor. In this case, we have mapped combined productivity for Metro, TheBus and MTA routes.

Future Roadway Levels of Service

While transit use is primarily driven by land use and supportive development patterns, roadway congestion can play a large role in mode choice, particularly for so-called "choice riders" and long-distance commuters. As traffic congestion builds, drivers will explore alternatives, particularly if that alternative can provide a substantial travel-time savings. While failing future levels-of-service are not typically a sufficient condition for the success of transit, they can aid in its success and can also provide congestion relief while supporting policy decisions against further expansion of roadway capacity in a given corridor. We have mapped estimated 2030 levels of service to aid in the identification of corridors which might benefit from future transit improvements.

Qualitative Factors

There are several additional factors which are important in the selection of potential transitway corridors for this study. These include:

1. Land use objectives and vision
2. Connectivity of activity centers

[3] No citation is provided for these thresholds, but they are certainly in line with the TCRP 100 numbers and other research. They are also in line with unpublished analysis by the County that successful TOD rail stations in this area have more than 10 households per acre and/or more than 20 jobs per acre in the immediate station vicinity.

3. Avoidance of environmental and other constraints
4. Complementarity with other jurisdictions' plans

General Plan

The General Plan identifies a number of corridors and activity centers in which future development will be focused. While this development is generally reflected in the demographic forecasts, the plan for corridors and other activity centers provides additional guidance for location and routing. As the land use plan for the County, it has been through a public involvement process and thus provides some indication of where residents would be supportive of a transitway.

General Plan Connectivity

Just as important as the locations is the ability of the transitway network to provide connectivity between these nodes. If they are to succeed as activity centers there must be good access to the nodes as well as good access between them. The proposed corridors attempt to maximize these connections and ensure high levels of mobility within the County.

Environmental and Other Constraints

It is important that none of the proposed corridors include any "fatal flaws" that would preclude further study. Foremost among these would be the potential for substantial harm to an environmentally sensitive area. Additionally, it is important to recognize areas set aside as parks and open space as well as important federal installations. While these not only present barriers for crossing, they also typically restrict the potential for future development. This limits the potential for transit-supportive density along the length of the transitway.

Complementarity with Other Plans

Part of this project is an evaluation of the plan in a regional context and identification of synergies with the plans of neighboring jurisdictions and other agencies. This includes the Montgomery County BRT Study, the DC Streetcar Plan, South Side Transit, Southern Maryland Transit and WMATA's RTSP. The draft analysis suggests some basic connections and overlap with the understanding that, based on subsequent discussions, these connections might be refined or strengthened.

Refinement

Following the initial identification, M/A/B worked closely with the county to revise the corridors for evaluation. This included incorporation of the feedback from the stakeholder workshop. At this point the corridors were divided into two groups: corridors for evaluation and corridors for future consideration. The final set of corridors for evaluation is shown below in Figure 4.7.

The corridors for future consideration consisted of corridors where we felt there would be insufficient data to evaluate them on par with other corridors. As these generally consist of nascent, inter-county corridors, additional coordination will be necessary to further define the corridors and prioritize them relative to in-county corridors. They include:

- US 50 from Bowie east into Anne Arundel County
- US 301/MD 3 from Upper Marlboro north into Anne Arundel County
- US 1 from the Laurel MARC station north into Howard County

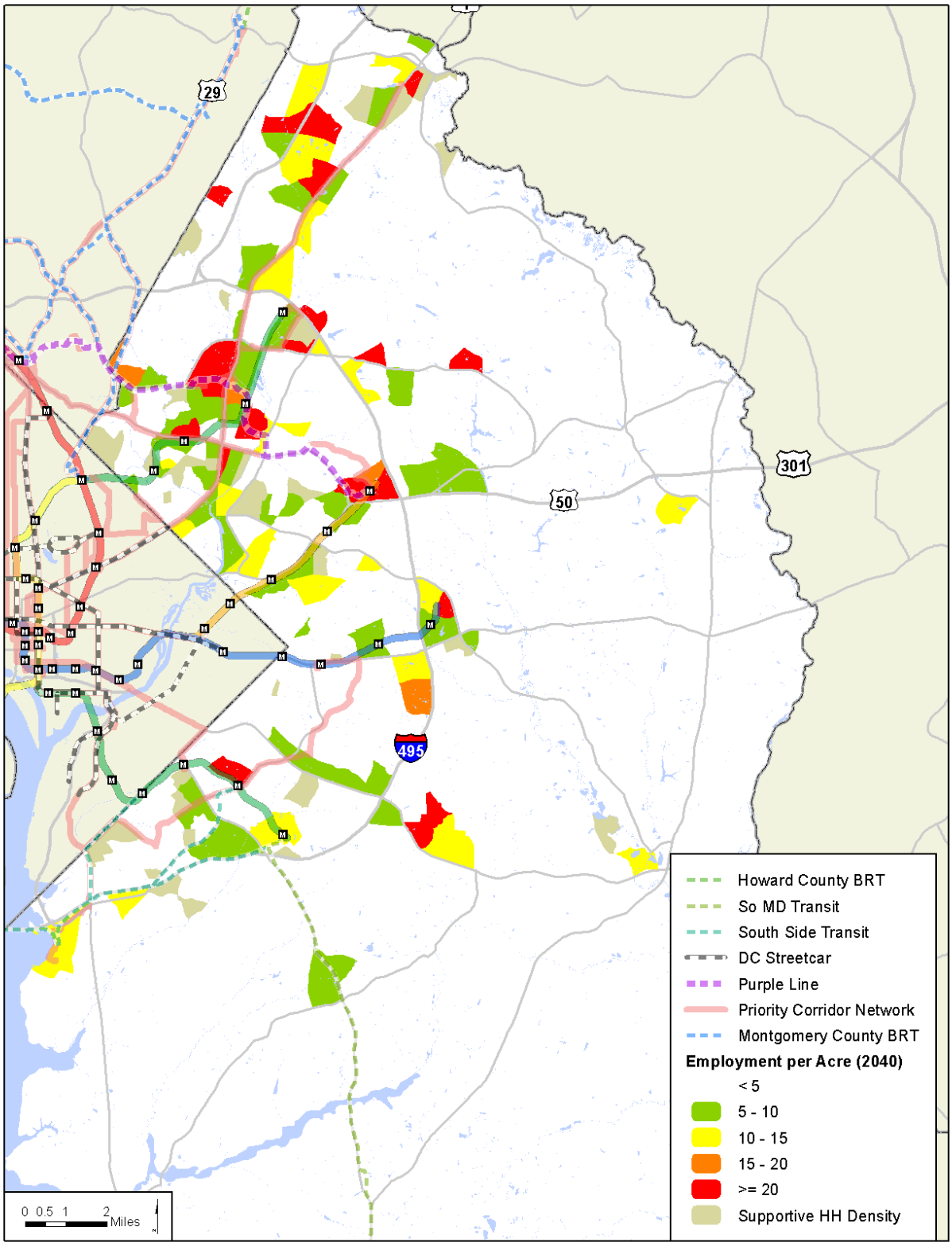


Figure 4.1 Employment Density (2040) by TAZ

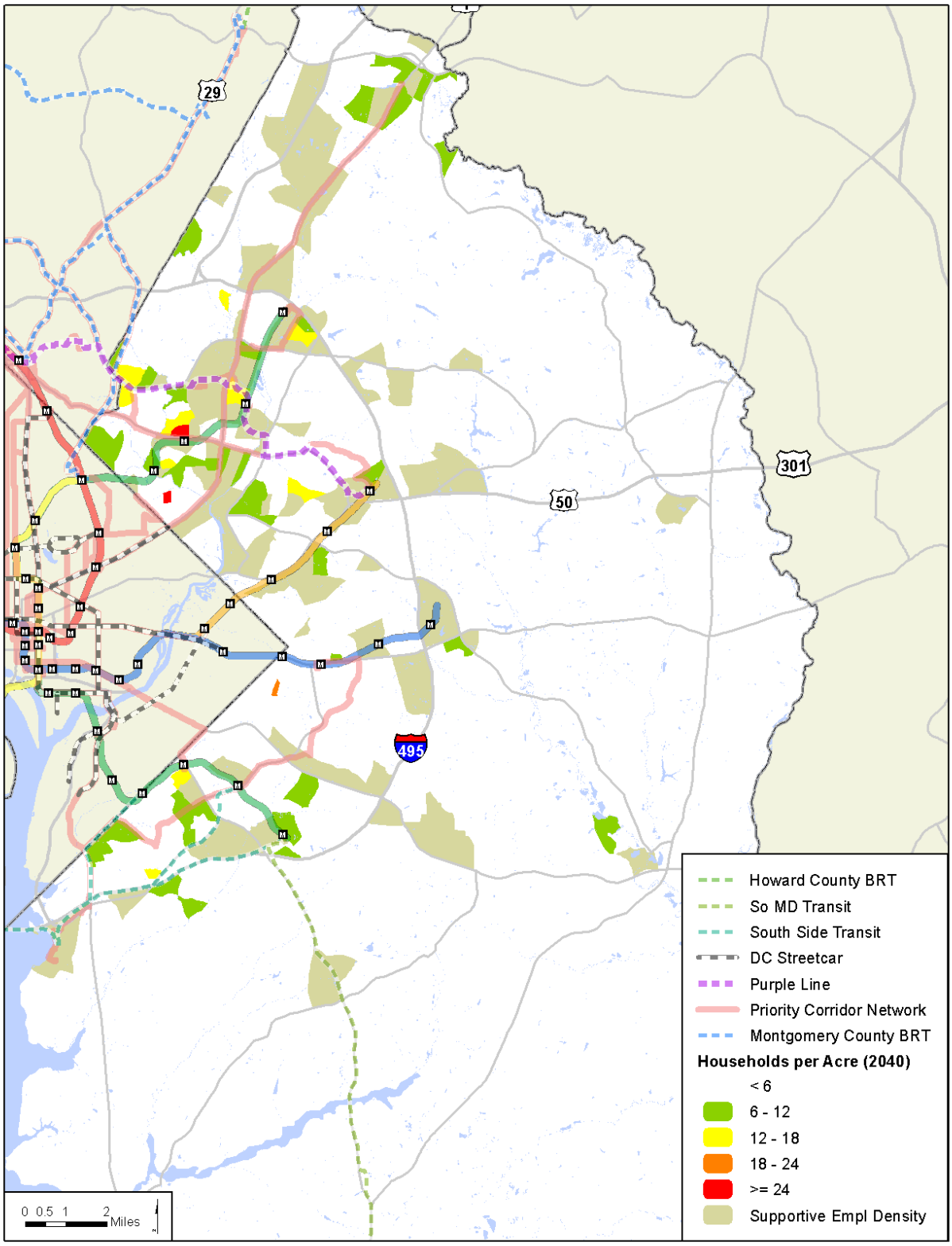


Figure 4.2 Household Density (2040) by TAZ

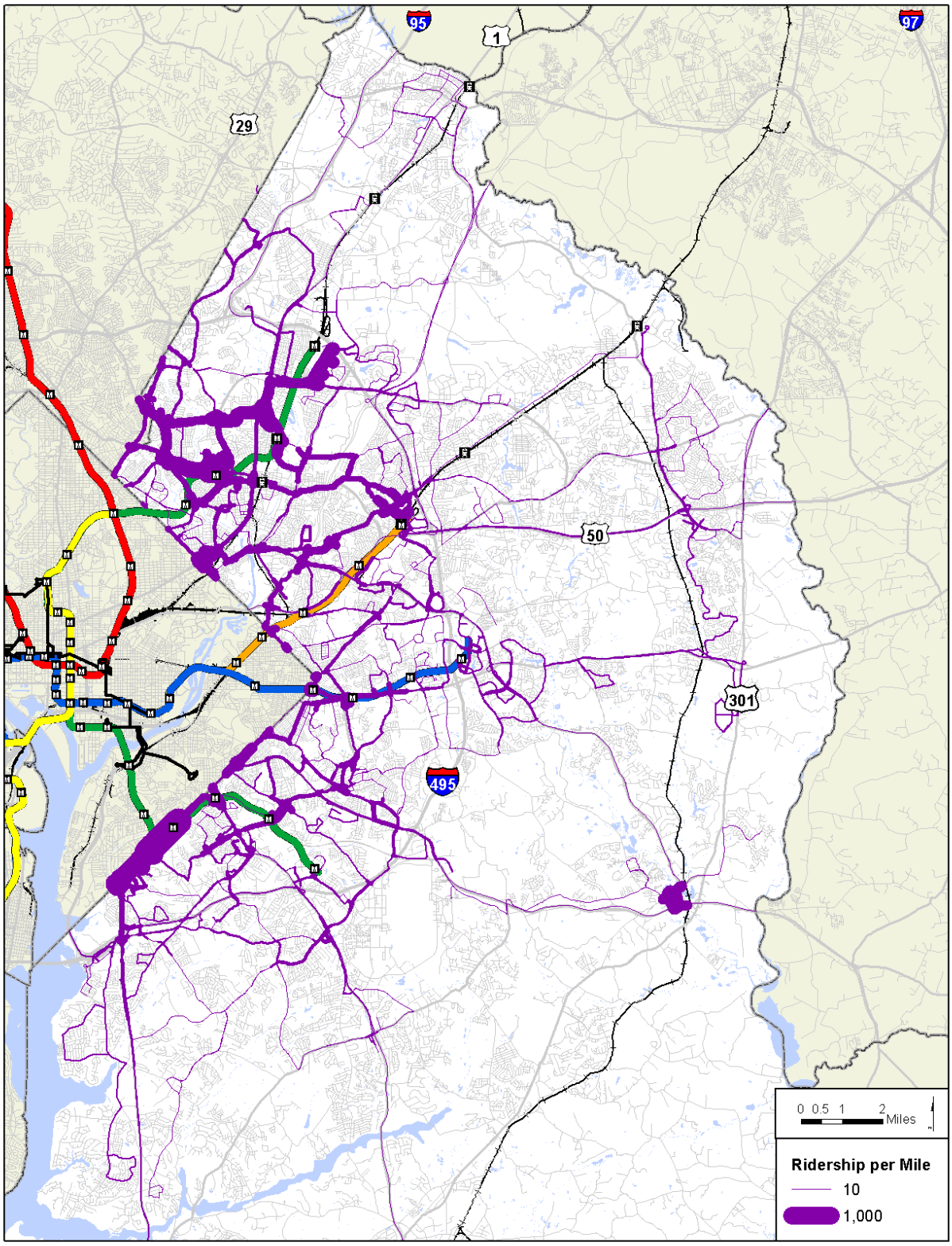


Figure 4.3 Total Ridership per Mile

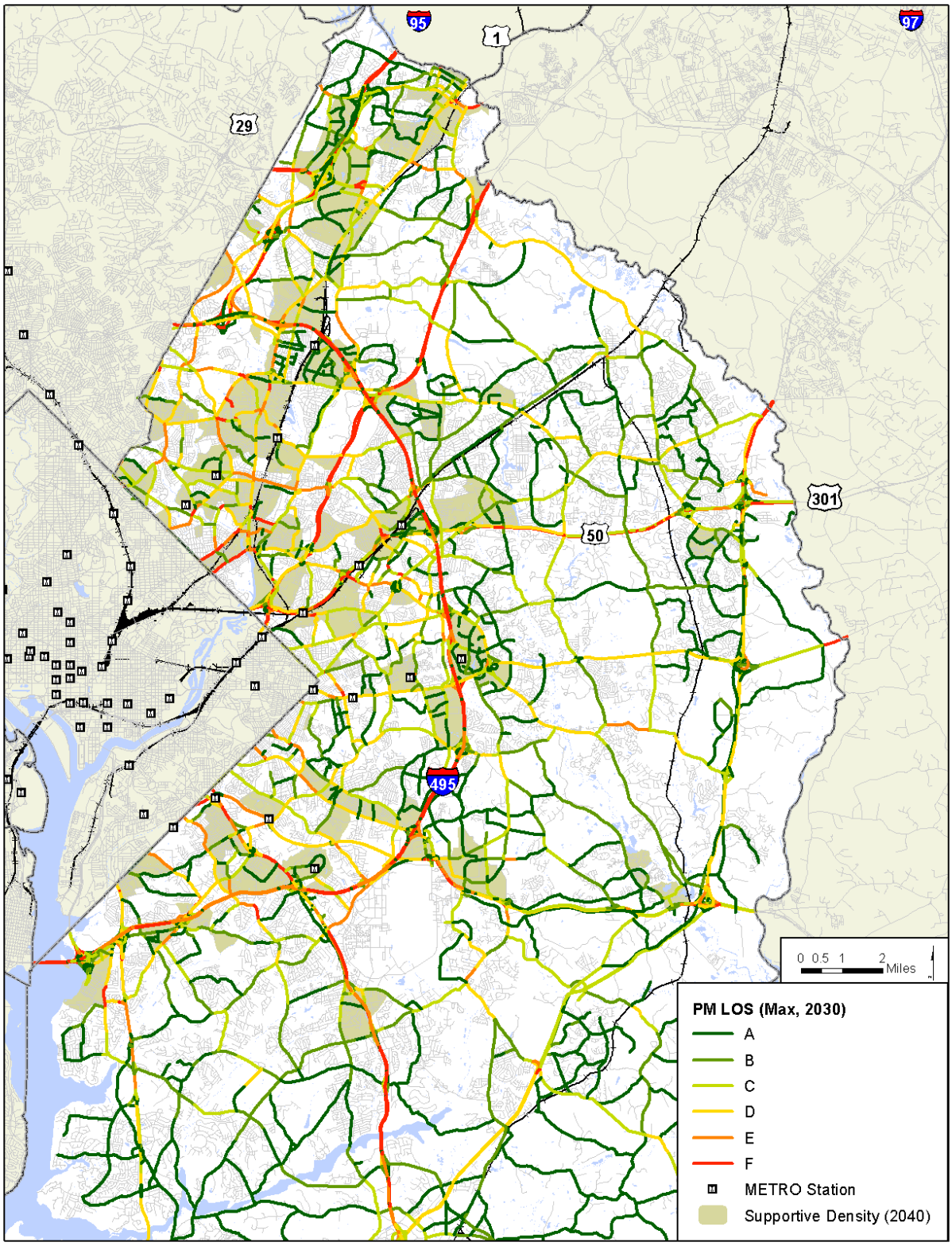


Figure 4.4 Future (2030) Level of Service (LOS)

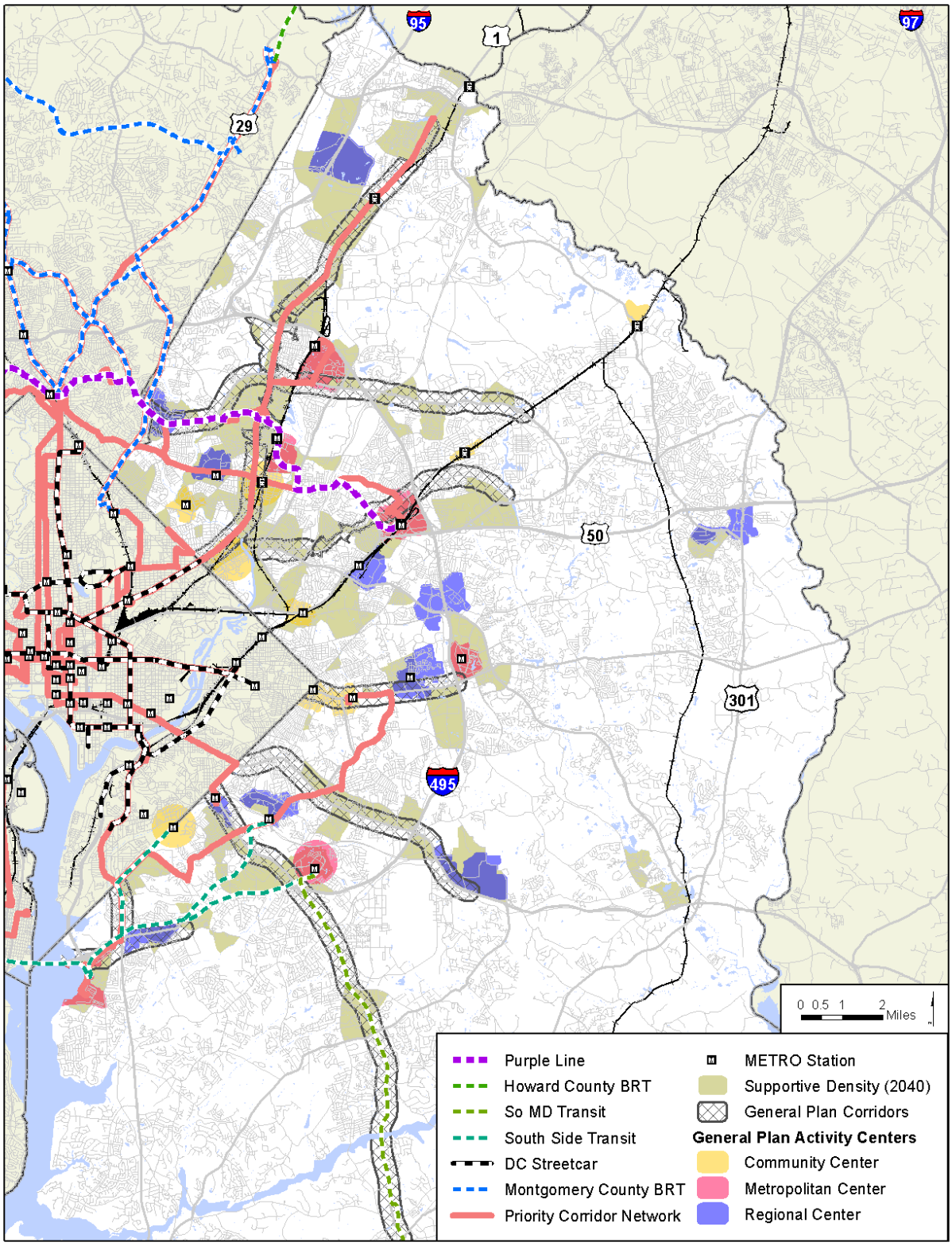


Figure 4.5 General Plan Corridors and Activity Centers

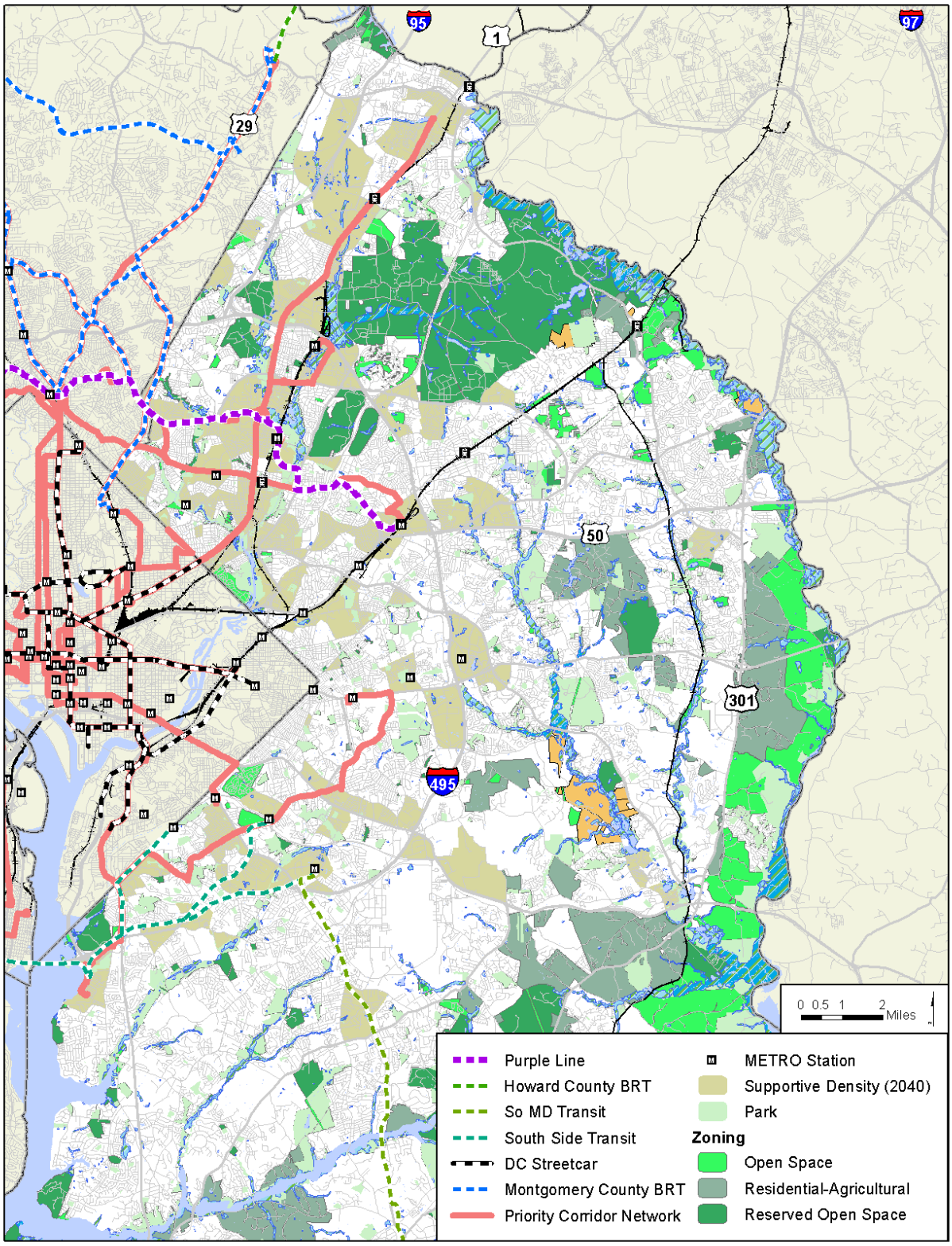
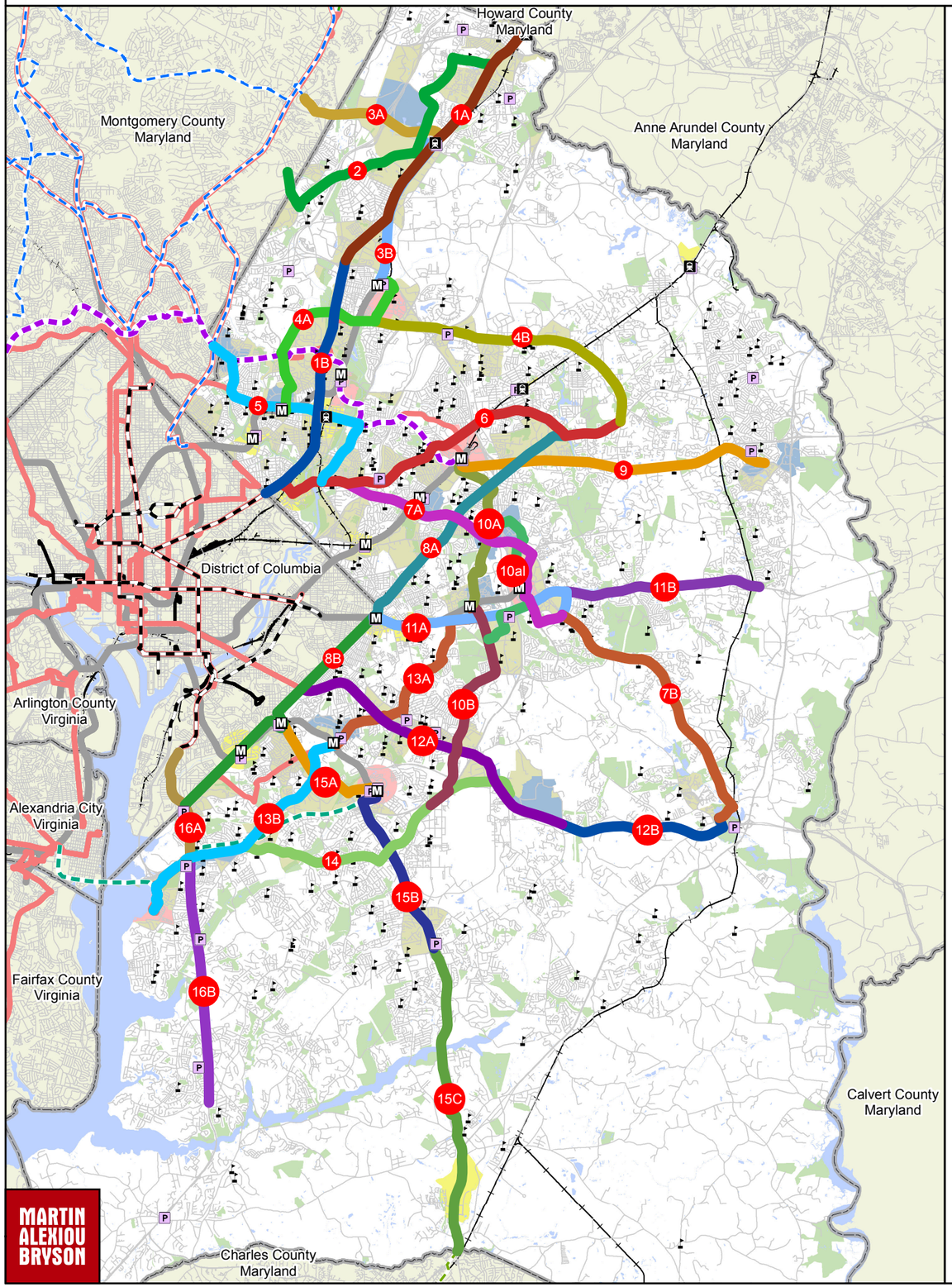


Figure 4.6 Open Space and Agricultural Land

Transitway Analysis Corridors

0 4 8 16 Miles

Legend Symbology



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Background Features

- METRO Station
- MARC Station
- Park-and-Ride
- School Point
- Hydrology
- Park
- Transit-Supportive Density (2040)

General Plan Activity Centers

- Community Center
- Metropolitan Center
- Regional Center
- Non-Study Area
- Prince George's County

Transit Features

- DC Streetcar
- Purple Line
- Howard County BRT
- South MD Transit
- South Side Transit
- Montgomery County BRT
- Priority Corridor Network
- Metrorail
- DC Circulator
- Railroad

Future Prince George County Transit

- 1A US 1 North
- 1B US 1 South
- 2 Konterra/Calverton
- 3A ICC
- 3B Greenbelt-Konterra
- 4A University Blvd/Adelphi Rd
- 4B Greenbelt Rd (MD 193)
- 5 East-West Highway (MD 410)
- 6 Annapolis Rd (MD 450)
- 7A Landover Rd (MD 202) North
- 7B Landover Rd (MD 202) South
- 8A MLK Jr Highway (MD 704)
- 8B Southern Ave
- 9 US 50
- 10A Brightseat Rd
- 10alt Largo
- 10B Ritchie Rd
- 11A Central Ave (MD 214) West
- 11B Central Ave (MD 214) East
- 12A Pennsylvania Ave (MD 4)
- 12B Upper Marlboro/MD 4
- 13A MD 458
- 13B MD 414/National Harbor
- 14 Brinkley Rd/Allentown Rd
- 15A Branch Ave (MD 5) North
- 15B Branch Ave (MD 5) Central
- 15C Branch Ave (MD 5) South
- 16A Indian Head Hwy (MD 210) North
- 16B Indian Head Hwy (MD 210) South

Prepared: 5/8/2012

4.2. Corridor Evaluation

Following the development of the draft list of corridors, the next step in the transitway plan development was the evaluation and ranking of those corridors. This section summarizes our approach and methodology in the evaluation and ranking. This section reflects the final evaluation criteria and weights. Based on feedback from the County and the discussion at the stakeholder workshop, the criteria and weights were adjusted to better reflect both the County priorities and the overall potential for success of the corridors.

Factors Used in the Evaluation

In all, 18 separate factors have been incorporated into the corridor evaluation. These factors build on those that were developed as part of the corridor identification. Each of the factors is listed below with a detail about its derivation following.

1. Existing Ridership
    a. Average riders per mile
2. 2010 Demographics
    a. Household density
    b. Employment density
3. 2040 Demographics
    a. Household density
    b. Employment density
4. General Plan Activity Center Connectivity
    a. Community centers
    b. Metropolitan centers
    c. Regional centers
    d. General Plan corridors
5. Transit Network Connectivity
    a. Metro stations
    b. MARC stations
    c. Rail park and ride lots
    d. Isolated park and ride lots
    e. Inter-county/state connections
    f. PCN corridor overlap
6. Highway Level of Service (LOS)
    a. Maximum 2030 LOS
7. Roadway volumes
    a. 2011 AADT
    b. Forecast 2030 AADT

Existing Ridership – Average Riders per Mile

Average ridership per mile was calculated at the street segment level as part of the corridor identification process. For the corridor evaluation, an estimate of total ridership for the corridor was achieved by multiplying this weight by the segment length and summing the product over the corridor length. For segments without existing transit service, the existing ridership was treated as

zero. The estimate of total ridership was divided by the corridor length to get an average of the total existing riders per mile along the corridor (this is, in effect, a weighted average of the segment-level riders per mile, weighted by segment length).

Ridership is a clear measure of the current attractiveness of the corridor and thus predictor of future success of new or improved transit.

Existing and Future Demographics – 2010 and 2040 Household and Employment densities

The Round 8.0 cooperative forecast data, at the TAZ level, was used to estimate existing and future demographic data for the corridors. The corridor was buffered at ½ mile, a typical average catchment area for high-quality bus service, BRT and LRT. This buffer was intersected with the TAZs, using GIS. The resulting population, household and employee totals were calculated for the buffer area. Densities were calculated by taking the total for the corridor buffer and dividing by the area of the buffer, in acres.

Demographic data provides a strong indicator as to the future success of new or improved transit. In particular, the higher the density, the more trips within the corridor and the more likely those trips will be by transit. If the density is too low, high frequency service is much less likely to be warranted and meet typical productivity targets.

General Plan Activity Center Connectivity

The ½-mile corridor buffer was overlaid with the General Plan and the number of Community Centers, Metropolitan Centers and Regional Centers falling within the buffer was totaled. A substantial portion of the center had to fall within the buffer in order for it to be counted. Additionally, the corridors were compared with the General Plan corridors and identified as either overlapping or partially overlapping a corridor.

The General Plan provides a vision for the future development of the county. In particular, the activity centers highlight areas envisioned to be local and regional hubs. Ensuring access to them and connectivity between centers is important to support the land use vision of the county.

Transit Network Connectivity

As with the activity center connectivity, the corridors were overlaid with area transit network information. The number of Metro and MARC stations served by each corridor was totaled. Similarly, if the corridor serves park and ride lots at one or more of these rail stations in addition to any free-standing park and ride lots, this was tallied. If the corridor crosses a jurisdictional boundary (into another county or the District of Columbia), that was noted. Finally, whether the corridor fully or partially overlapped existing PCN corridors was identified.

As most of the transitways are envisioned as supplemental to the backbone of the rail network, at least for many years to come, it is important that the rail stations, Metro and MARC, remain well-served. This connectivity allows for improved access to regional transportation while, with the transitways, providing a higher quality connection than local bus to destinations not rail-adjacent. Similarly, for many travelers the auto will continue to play an important role in their daily transportation; providing connectivity to park and ride lots will provide improved options and mobility. Inter-county connections ensure County employers have access to a wider labor pool and that County citizens can participate in activities outside the County. The PCN corridors have already been identified by WMATA as worthy of improved bus service and other operational improvements.

Highway Network Level of Service

Level of service (LOS) is a good measure of future congestion. As corridors become more congested, travelers may be more likely to take transit, particularly if that transit offers travel time savings over the auto (as would be the goal of a transitway). For this analysis, we identify the lowest performing link (in 2030 as reported by the travel demand model) along the corridor and code the corridor with this level of service. While this is an extremely simple treatment, level of service is a very complex calculation and to achieve the level of detail needed to look at delay and average travel speeds along the length of each corridor was beyond the scope of this project.

Roadway Volumes

Roadway volumes give an idea of travel demand within the corridor. As the most new riders along the transitway would come from vehicles, it is important to understand existing and future roadway demand. The volumes used represent the highest AADT along a typical segment of the corridor. Very short segments were considered atypical. For the current-year volumes, facilities which do not exist were assumed to have a volume of 0 (i.e. the ICC east of I-95). Future year volumes were taken from the Prince George's county travel demand model (TransForM).

Additional Factors for Future Evaluation

In the process of identifying factors for evaluation, several items entered the discussion but were not included in the ultimate model. In most cases, it was an issue of data availability: detailed 2010 Census data is not yet available, ACS data is not available at a fine geography and 2000 Census is outdated. In some cases there was an interest to explore both existing and future demographics but the data has not been forecast and/or disaggregated. Ability to collect the data, given the limited timeframe and, in some cases, complex nature of the data, was also a factor.

Additional factors considered include the following:

- 0 car households and/or households with more workers than autos
- "Buildout" demographics (that is beyond 2040)
- Existing and future average transit travel speed along the corridor, with and without the transitway
- Delay along the corridor (vehicle-hours and/or person-hours)
- Additional transit accessibility provided by the corridor
- Existing ridership at the segment level, particularly peak hour riders in the peak direction
- Economic benefits (development or otherwise)

Inclusion of these factors should be considered in future analysis of the corridors.

Corridor Evaluation

The evaluation consisted of two steps: quantifying the data on a similar scale; and developing weights to allow for the relative comparison of the factors.

Quantification of the Data

The goal was to scale each factor so that, in the end, the individual elements, and their totals, are relatively comparable and are within a range that is intuitive and easy to evaluate. To achieve this, our target was that most values would be between 0 and 5 allowing for most categories of factors to

have totals between 0 and 10. This would result in a total score, after weighting, on the order of 100 points.

Individual factors are described below:

1. Average riders per mile – The unweighted score is calculated by dividing the average riders per mile by 100. Based on the inputs, this yields weights of 0 to 6.
2. Household and employment density – Score calculation was the same for 2010 and 2040. While most values, for both household and employment density, are between 0 and 10, the benefits are not necessarily linear. Specifically while there is some potential ridership for areas that are below "supportive" thresholds, it is minimal. Similarly, given that most densities in the area are moderate, it is important to highlight higher density areas as being more transit supportive. A number of formulations were evaluated. The final recommendation is below. Each formulation yields a score of 2 for a density at the minimum "supportive" level.
    a. Household density – Raw score is calculated using the following formula:

        where HH is the household density in units per acre.

    b. Employment density – Raw score is calculated using the following formula:

        where E is the employment density in units per acre.
3. Community centers, Metropolitan Centers, Regional Centers – 1 point for every center served by the corridor.
4. General Plan corridors – 2 points if there is full overlap with one or more corridors; 1 point if it was deemed partial overlap.
5. Metro stations, MARC stations, Rail park and ride lots and Isolated park and ride lots – 1 point for every location served by the corridor. Note that Purple Line stations were awarded 0.5 points.
6. Inter-county/state connections – 1 point if the corridor crossed a jurisdictional boundary, 0 otherwise.
7. PCN Corridors – 2 points if there is full overlap with one or more corridors; 1 point if it was deemed partial overlap.
8. Highway LOS – As the focus was on the possibility that poor highway LOS would encourage transit ridership, the focus was on highlighting corridors where future congestion is expected to be high. 1 point was awarded for LOS D, 2 points for LOS E and 3 points for LOS F.
9. Roadway volumes – The unweighted score is calculated by dividing the total vehicles per day by 10,000.

Final Weights

Based on the raw scores generated (as per above), we developed indicator and category weights. These weights are summarized in the table below.

Table 4.1 Summary of Corridor Evaluation Weights

Category	Indicator	Weight
Avg. Riders Per Mile		**5**
2010 Densities	Max of HH and Empl	**3**
2040 Densities	Max of HH and Empl	**6**
Activity Centers	Sum	**4**
	Community Center	1
	Metropolitan Center	5
	Regional Center	3
	General Plan Corridor	2
Network Connectivity	Sum	**3**
	Metro Station	3
	MARC Station	2
	Rail P-&-R	0.5
	Isolated P-&-R	1
	Inter-County	4
	PCN Corridor	0.5
LOS		**2**
2011 AADT		**1**
2030 AADT		**1.5**

Final Corridor Scoring

Based on the weights shown above an evaluation of the corridors was completed. The total points and rankings are shown in the table below. The top five ranked corridors are shown in bold while the bottom five corridors are shown in gray.

In addition to the corridor evaluation, a sensitivity analysis was performed to better understand the sensitivity of the rankings to the weights developed. The results of that sensitivity testing are also shown in the table, indicating the lowest and highest rankings achieved under the varied weights and the overall average. Ordering by average rank yields the same ranking as that using the weights developed above. This indicates that, aside from substantial reweighting or the addition or subtraction of factors, the top corridors tend to share similar transit-supportive attributes while those least promising, at present at least, are also quite similar. The parameters used in the sensitivity testing are shown in the subsequent table.

Table 4.2 Summary of Corridor Scoring

ID	Corridor Name	Total Points	Rank	Sensitivity Testing Rank Min	Max	Average
1A	US 1 North	74.9	20	21	17	20.0
1B	US 1 South	**138.3**	**3**	**5**	**3**	**3.2**
2	Konterra/Calverton	74.6	21	23	16	20.4
3A	ICC	82.4	17	23	10	16.8
3B	Greenbelt-Konterra	108.6	8	12	7	8.7
4A	University Blvd/Adelphi Rd (MD 193)	**147.6**	**2**	**3**	**1**	**2.0**
4B	Greenbelt Rd (MD 193)	70.2	22	23	16	21.7
5	East-West Highway (MD 410)	**154.9**	**1**	**2**	**1**	**1.2**
6	Annapolis Rd (MD 450)	94.6	14	20	11	14.3
7A	Landover Rd (MD 202) North	106.2	10	11	7	9.7
7B	Landover Rd (MD 202) South	29.9	28	29	28	28.0
8A	MLK Jr Highway (MD 704)	43.4	27	27	25	26.8
8B	Southern Ave	117.6	7	15	**1**	7.7
9	US 50	104.5	12	14	6	11.1
10A	Brightseat Rd	100.6	13	18	8	13.0
10alt	Largo	86.9	16	22	13	16.6
10B	Ritchie Rd	52.1	25	26	24	24.9
11A	Central Ave (MD 214) West	**123.3**	**5**	**7**	**3**	**5.2**
11B	Central Ave (MD 214) East	25.0	29	29	28	29.0
12A	Pennsylvania Ave (MD 4)	79.8	19	21	16	18.5
12B	Upper Marlboro/MD 4	47.3	26	27	25	26.0
13A	MD 458	87.6	15	19	13	15.7
13B	MD 414/National Harbor	107.1	9	14	6	9.4
14	Brinkley Rd/Allentown Rd	56.5	24	26	23	24.2
15A	Branch Ave (MD 5) North	**126.1**	**4**	**6**	4	**4.4**
15B	Branch Ave (MD 5) Central	119.2	6	9	**1**	6.1
15C	Branch Ave (MD 5) South	80.9	18	21	8	17.4
16A	Indian Head Highway (MD 210) North	105.8	11	13	7	10.5
16B	Indian Head Highway (MD 210) South	65.0	23	24	15	22.3

Table 4.3 Category Weights Used in Sensitivity Testing

Category	Low	Proposed	High
Avg. Riders Per Mile	1	5	10
2010 Densities	1	3	10
2040 Densities	2	6	12
Activity Centers	1	4	10
Network Connectivity	1	3	10
LOS	1	5	10
2011 AADT	.5	1	5
2030 AADT	.5	1.5	5

5. PRIORITY CORRIDORS

Following the initial corridor evaluation, the County identified several corridors for subsequent evaluation. This list drew from the corridors evaluated in the previous step, identifying corridors – or in some cases combinations of corridors – that are promising and help support the broader economic and social goals of the County.

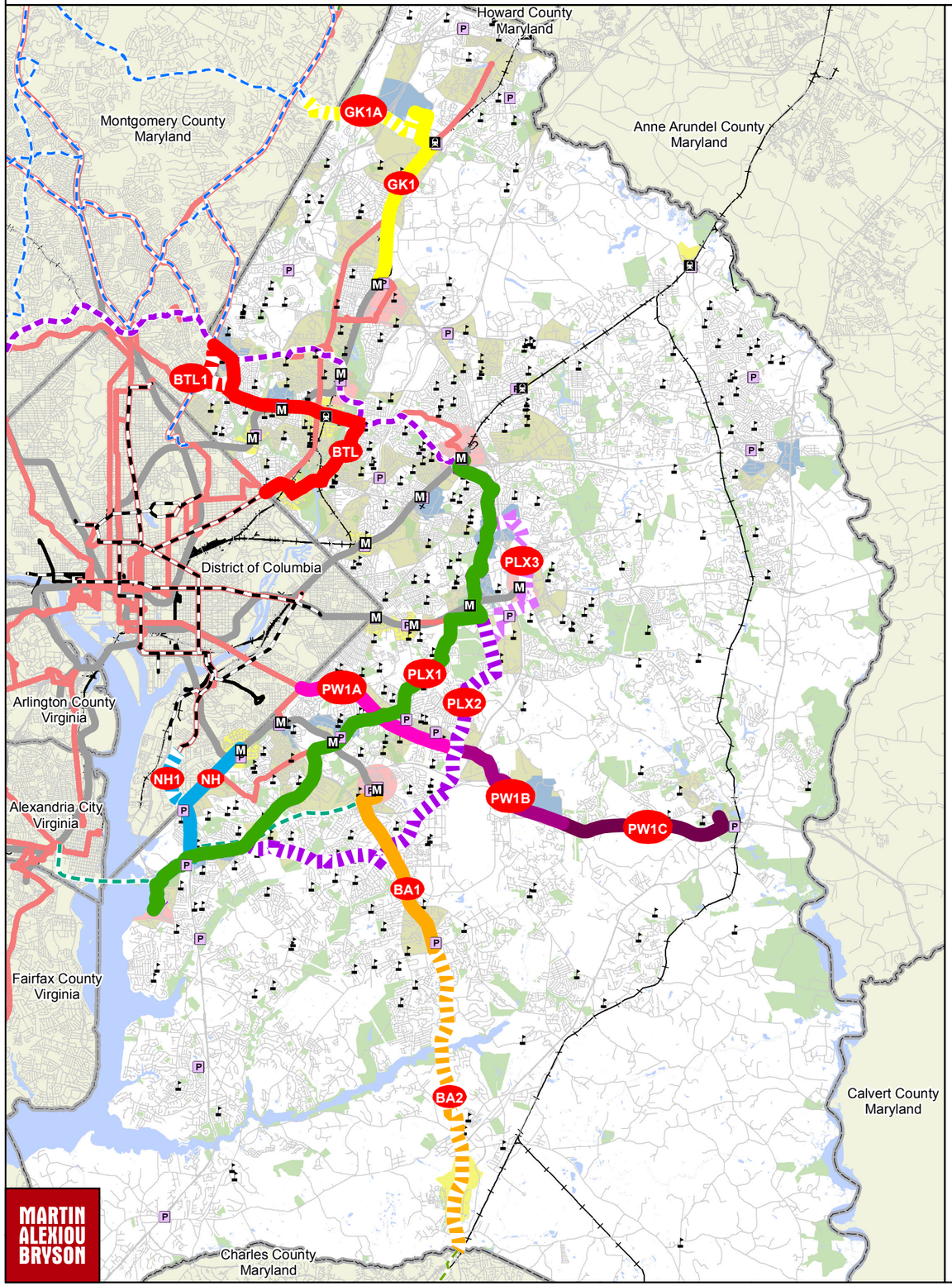
5.1. Priority Corridor Evaluation

The priority corridors consist of six overall corridors broken into smaller segments similar to the initial corridors. They are shown in Figure XX and briefly summarized below.

- Bladensburg – Takoma-Langley Park [BTL]: This is primarily Corridor 5 (East-West Highway) but extends to the south along portions of MD 450, US1A and ultimately to US1 to meet up with the Rhode Island Ave DC streetcar at the District line. An alternate would use New Hampshire Avenue instead of Riggs Road to head north to University Ave and the Takoma-Langley Crossroads.
- Greenbelt – Konterra [GK]: Beginning at the Greenbelt Metro, this corridor is identical to Corridor 3B. An optional extension would go from Konterra along the ICC to the Briggs-Chaney Park and Ride lot, connecting with the proposed Montgomery County ICC route. Optionally it could be an extension of that route.
- National Harbor [NH]: There are two alternatives for this corridor serving National Harbor. The first uses Southern Ave and Indian Head Highway, mimicking one of the alternatives from the South Side Transit Study. The second alternative would connect to the DC streetcar along MLK Jr Ave SE in the district and is identical to Corridor 16A.
- Purple Line Extensions: Three possible extensions have been identified.
    - Inner Purple Line Extension [PLX1]: Starting at New Carrolton, follow Corridor 10A. Continue along Corridors 13A and 13B, terminating at National Harbor. This would presumably connect to the South Side Transit crossing but that crossing was not analyzed as part of this study.
    - Outer Purple Line Extension [PLX2]: Starting at New Carrolton, follow Corridor 10A. Continue along Corridor 10B to its end at Corridor 14. Follow Corridor 14 to its end at Corridor 13B. Continue along 13B, terminating at National Harbor. This would presumably connect to the South Side Transit crossing but that crossing was not analyzed as part of this study.
    - Outer Purple Line Extension Alternative [PLX3]: Starting at New Carrolton, follow Corridor 10A. At 10alt, follow 10alt through Largo and back to 10B. Continue along Corridor 10B to its end at Corridor 14. Follow Corridor 14 to its end at Corridor 13B. Continue along 13B, terminating at National Harbor. This would presumably connect to the South Side Transit crossing but that crossing was not analyzed as part of this study.

CTSP Priority Analysis Corridors

0 4 8 16 Miles



MARTIN ALEXIOU BRYSON

Legend Symbology

Background Features

- METRO Station
- MARC Station
- Park-and-Ride
- School Point
- Hydrology
- Park
- Transit-Supportive Density (2040)

General Plan Activity Centers

- Community Center
- Metropolitan Center
- Regional Center
- Non-Study Area
- Prince George's County

Transit Features

- DC Streetcar
- Purple Line
- Howard County BRT
- South MD Transit
- South Side Transit
- Montgomery County BRT
- Priority Corridor Network
- Metrorail
- DC Circulator
- Railroad

Future Prince George County Transit

- BTL Bladensburg - Takoma-Langley Park
- BTL1 Bladensburg - Takoma-Langley Park Alternate
- BA1 Branch Avenue
- BA2 Branch Avenue Extension
- GK1 Greenbelt - Konterra
- GK1A Greenbelt - Konterra Alternate
- PLX1 Inner Purple Line Extension
- NH National Harbor
- NH1 National Harbor Alternate
- PLX2 Outer Purple Line Extension
- PLX3 Outer Purple Line Extension Alternate
- PW1A Penn-Westphalia - Stage 1
- PW1B Penn-Westphalia - Stage 2
- PW1C Penn-Westphalia - Stage 3

Prepared: 6/12/2012

- Penn-Westphalia [PW]: This corridor is identical to Corridor 12 (Pennsylvania Avenue) but examines the segments differently. The first segment begins at the District line and extends to Ritchie Rd (Corridor 10B). The second segment continues along Pennsylvania Avenue to Westphalia Town Center. The third segment continues from Westphalia to Upper Marlboro and is identical to Corridor 12B.
- Branch Avenue [BA]: This corridor overlaps Corridor 15 and is divided into two segments. The first segment begins at the Branch Avenue Metro station and is identical to Corridor 15B. The second segment extends to Charles County as is identical to Corridor 15C.

In order to understand how these corridors compared with one another (and the other corridors), the same set of inputs was collected for each. They were then evaluated using the same methodology as described above. To reflect the social and economic priority of these corridors an additional ten points was awarded when comparing the priority corridors to other corridors.

In the process of evaluation, it became clear that, where most of the initial set of corridors are of similar length, some of the priority corridors are much longer, yielding scores that are disproportionate to the other corridors. While this higher score reflects the fact that, overall, the longer corridor better meets the county's mobility, social and economic objectives, part of this study is to assist with understanding efficacy of the corridors. To this end, each corridor's efficiency (points per mile) was also evaluated. Ultimately, the final ranking was determined by using a weighted average ranking with 75 percent of the ranking coming from the total score and the remainder from its rank based on points per mile. The total points and final rankings are shown in the table below. For comparison with the initial table, corridors that are duplicates of the priority corridors are shown as well.

Table 5.1 Summary of Corridor Scoring

ID	Corridor Name	Total Points	Final Rank	Rank Components	
				Raw Rank	Efficiency Rank
1A	US 1 North	74.9	30	30	27
1B	US 1 South	138.3	11	9	14
2	Konterra/Calverton	74.6	32	31	33
3A	ICC	82.4	26	27	16
3B	Greenbelt-Konterra	108.6	15	16	8
4A	University Blvd/Adelphi Rd (MD 193)	147.6	5	8	6
4B	Greenbelt Rd (MD 193)	70.2	34	32	31
5	East-West Highway (MD 410)	154.9	4	6	10
6	Annapolis Rd (MD 450)	94.6	23	22	29
7A	Landover Rd (MD 202) North	106.2	21	18	22
7B	Landover Rd (MD 202) South	29.9	38	38	39
8A	MLK Jr Highway (MD 704)	43.4	37	37	37
8B	Southern Ave	117.6	16	14	19
9	US 50	104.5	22	19	23
10A	Brightseat Rd	100.6	19	21	11
10alt	Largo	86.9	23	26	17
10B	Ritchie Rd	52.1	36	36	35
11A	Central Ave (MD 214) West	123.3	13	13	13
11B	Central Ave (MD 214) East	25.0	39	39	38

ID	Corridor Name	Total Points	Final Rank	Rank Components: Raw Rank	Rank Components: Efficiency Rank
12A	Pennsylvania Ave (MD 4)	79.8	29	28	28
12B	Upper Marlboro/MD 4	57.3	32	34	24
13A	MD 458	87.6	25	25	21
13B	MD 414/National Harbor	107.1	18	17	20
14	Brinkley Rd/Allentown Rd	56.5	35	35	36
15A	Branch Ave (MD 5) North	126.1	9	12	1
15B	Branch Ave (MD 5) Central	129.2	6	10	4
15C	Branch Ave (MD 5) South	90.9	26	24	25
16A	Indian Head Highway (MD 210) North	115.8	14	15	9
16B	Indian Head Highway (MD 210) South	65.0	31	33	26
BTL	Bladensburg - Takoma-Langley Park	181.3	1	3	12
BTL1	Bladensburg - Takoma-Langley Park Alt	177.1	3	4	15
GK1	Greenbelt - Konterra	128.0	10	11	7
GK1A	Greenbelt - Konterra Alternate	101.6	17	20	2
NH	National Harbor	148.6	2	7	3
NH1	National Harbor Alternate	115.8	14	15	9
PLX1	Inner Purple Line Extension	185.8	8	2	30
PLX2	Outer Purple Line Extension	169.8	12	5	34
PLX3	Outer Purple Line Extension Alternate	194.4	7	1	32
PW1A	Penn-Westphalia - Stage 1	79.4	28	29	18
PW1B	Penn-Westphalia - Stage 2	92.2	19	23	5
PW1C	Penn-Westphalia - Stage 3	57.3	32	34	24
BA1	Branch Avenue	129.2	6	10	4
BA2	Branch Avenue Extension	90.9	26	24	25

As many of the corridors are mutually exclusive – both a corridor and its alternate are unlikely to be built – the final list of corridors is much smaller. Reviewing the table above for duplicates yields the table below. Note, in this table, initial corridors which duplicate the priority corridors are not shown.

Table 5.2 Final Corridor Ranking

Rank	Corridor		Total
1	BTL	Bladensburg - Takoma-Langley Park	181.3
2	NH	National Harbor	148.6
3	4A	University Blvd/Adelphi Rd (MD 193)	147.6
4	BA1	Branch Ave (MD 5)	129.2
5	PLX3	Outer Purple Line Extension Alternate	194.4
6	15A	Branch Ave (MD 5) North	126.1
7	GK1	Greenbelt - Konterra	128.0
8	1B	US 1 South	138.3
9	11A	Central Ave (MD 214) West	123.3
10	8B	Southern Ave	117.6
11	GK1A	Greenbelt - Konterra Extension	101.6
12	13B	MD 414/National Harbor	107.1

13	PW1B	Penn-Westphalia - Stage 2	92.2
14	7A	Landover Rd (MD 202) North	106.2
15	9	US 50	104.5
16	6	Annapolis Rd (MD 450)	94.6
17	13A	MD 458	87.6
18	BA2	Branch Ave (MD 5) South	90.9
19	PW1A	Penn-Westphalia - Stage 1	79.4
20	1A	US 1 North	74.9
21	16B	Indian Head Highway (MD 210) South	65.0
22	2	Konterra/Calverton	74.6
23	PW1C	Penn-Westphalia - Stage 3	57.3
24	4B	Greenbelt Rd (MD 193)	70.2
25	8A	MLK Jr Highway (MD 704)	43.4
26	7B	Landover Rd (MD 202) South	29.9
27	11B	Central Ave (MD 214) East	25.0

5.2. Corridor Prioritization

Based on the above evaluation, the County will proceed to develop a final prioritization for the transitway corridors. Such prioritization will account for practical aspects beyond the scope of this study. For example, as the goal is to pursue near-term implementation of one or more corridors, it will be important to understand the relative operational benefits of high-priority corridors. Similarly, federal and state funding is increasingly more difficult to obtain, so the ability to obtain private participation or the potential success of alternative funding mechanisms may drive the short-term priorities. Additionally, several routes require coordination with other jurisdictions and operators; it will be important to ensure that the County's vision is fully compatible and interoperable with other systems, many of which are still in development. As such, these corridors may not be feasible in the short-term.

A summary of potential elements which might alter the ultimate near-term priority include:

- 15A – Branch Avenue North: this service is largely duplicative of the Green Line and is relatively short so may not ultimately be developed as a "transitway". It may, however, be a good candidate for operational improvements. This could change if the land use patterns change and depending upon the final alignment and mode of improvements along Branch Avenue south of this corridor.
- 1B – US 1 South: Improved bus service and operational improvements in line with the PCN plans make sense. Additional improvements will likely benefit from coordination with the District's plans and timing for the Rhode Island Avenue streetcar.
- 11A – Central Avenue West: This service largely duplicates existing Blue Line service so would need to be studied closely to ensure that there are additive benefits.
- 8B – Southern Avenue: A substantial portion of this route – including the portion with the highest existing bus ridership – overlaps with the National Harbor corridor. Additionally all improvements will need to be closely coordinated with the District and their transit planning efforts.

- 9 – US 50: If this is bus service, it would primarily operate in the existing HOV lanes, so there would be few improvements necessary to implement though the route largely overlaps existing service. New fixed guideway service would be possible but would likely require substantial changes to the existing land use vision for the corridor to succeed. This corridor may have an increased priority, though, if extensions into Anne Arundel County, along US 50 or MD 3, become a high priority.
- Several of the outer corridor extensions, such as 4B, 7B and 11B are generally premature given existing land use patterns. If the vision for these corridors shifts, however, it will be important to consider corridor preservation to ensure that they can be implemented readily when the time comes.

Modal Decisions and Phasing

As part of the final prioritization, it will be important to develop County-preferred buildout modes for the corridors. This will drive the planning schedule and how the projects fit into the funding cycle. In general, all high-ranking corridors should be able to support high frequency bus service. Many would benefit from traffic-signal prioritization and other elements that typically classify a service as BRT. Without a ridership analysis, it is difficult to predict whether ridership would be sufficient for a high-frequency BRT or LRT system on one or more of the line given the current inputs. As discussed below, one of the key next steps is harmonization of the transit vision with the land use vision. For many of the corridors, there are large, dense anchors – typically auto-centered – but only moderate density in between. For high-frequency fixed guideway transit to flourish, it needs transit-friendly development, and densities, along much if not all of the corridor. This is a matter of both ensuring the appropriate zoning and incentives are in place as well as painting a clear vision for residents and developers that they can support.

For areas where fixed guideway transit is desired endpoint, it will be important to evaluate how improvements in that corridor fit within the broader scheme. Given the length of the current funding and construction process, in many cases, it will be desirable to phase the improvements, starting with high quality bus service with spot improvements while planning for more capital-intensive improvements continues. The proposed Purple Line Extensions, for example, all have bus service but it is through a collection of routes serving only pieces of the entire corridor. In the near term, a bus route covering most or all of the corridor would help the County and citizens envision the reconstructed route system and also develop a baseline ridership.

5.3. Next Steps

Following the finalization of the corridor priorities, it will be important to better understand the potential benefits, impacts and costs of each of the corridors. Key next steps include:

- Demand analysis at the route and system level. This will most likely involve the use of the travel demand model to code the transitway network and analyze the estimated ridership. Ultimately it will be important to understand how individual segments perform under a phased construction scenario.
- Operational analysis of existing transit within the corridor. One of the key benefits of a transitway – or related improvements – is the decrease in travel time for transit riders. In areas with little congestion today, travel time improvements would need to come from

reductions in stop frequency or other amenities such as off-board fare collection. Indentifying hot spots will provide a good indicator of priority areas for improvement.

- Detailed corridor feasibility and improvements requirements analysis. In order to develop a better understanding of the costs, it will be important to provide a fine-scale analysis of the corridors to understand where a transitway could fit within current right of way, where it might operate in mixed traffic and where new right of way might be required. Such analysis could provide insight into likely station locations and locations where traffic signal priority might be required.
- Evaluation of land use in the corridors. As noted above, while many of these corridors could succeed as high-quality bus routes, the vision of many in the County includes a broad network of fixed-guideway transit. While investment in such transit can spur increased densities along the transit corridor, it is important to ensure that the land use vision for these corridors is compatible with the transit vision. If dense development is not allowed along a corridor, it will be difficult to attain ridership levels desired without an extensive – and costly – feeder system.
- Ongoing coordination with neighboring jurisdictions. Many of the corridors identified in this study connect to existing or planned transit in neighboring jurisdictions. In order to maximize the quality of the system and its future mobility benefits, it will be important that service between jurisdictions be as seamless as possible. Similarly, it will be critical to ensure compatible timelines, technologies and alignments.

6. CONCLUSIONS

This study provides a starting point for a transitway network in Prince George's County. It introduces a highly customizable, but rapid deployment methodology, for comparing corridors for their long-term transit suitability. The numerical outputs provide a guidepost for future study and prioritization of the transit corridors. The County is already working on developing a prioritization and looking to move forward with further study and the pursuit of grants to aid in implementation of improvements along one or more corridors.

In addition to the near-term objective of developing a transitway systems plan for Prince George's County, the study has also helped foster improved long-term transit systems planning within the region. The participants in the workshops are already looking to establish a standing meeting of transit systems planners in the region and expand it to include participants from across the Metropolitan Washington region.

Appendix A: Corridor Cut Sheets

Appendix B: Priority Corridor Cut Sheets

Appendix C: Corridor Descriptions

Transitway Corridor Alignment Descriptions

The following are descriptions of the corridor alignments. Unless otherwise noted, radial corridor descriptions start closest to the District and circumferential descriptions progress in a clockwise direction.

Priority Corridors

Greenbelt-Konterra (GK1, GK1A): Begin at Greenbelt Metro station and travel north along the railroad right of way. At the Muirkirk MARC station, turn west to Virginia Manor Rd. Follow Virginia Manor Rd into Konterra and terminate. Optionally continue along the ICC to the Briggs Chaney Park and Ride (GK1A).

Inner Purple Line Extension (PLX1): Begin at New Carrollton Metro and continue southeast on Ardwick Ardmore Rd. Turn south on Brightseat Rd. At Sheriff Rd, continue south past FedEx Field to Garret Morgan Blvd. Connect with the Morgan Blvd Metro and continue south to Central Ave (MD 214). Turn west and continue to Shady Glen Dr. Turn south on Shady Glen Dr. Continue southwest on Walker Mill Rd. Connect to Silver Hill Rd. (The current PCN corridor follows County Rd south to Old Silver Hill Rd and back west to Silver Hill Rd.) Connect with the Suitland Metro and continue west on Silver Hill Rd (MD 458). Turn south on St Barnabas Rd (MD 414). Continue southwest across I-95 to Oxon Hill Rd (MD 414). Turn west along Oxon Hill Rd (MD 414) across Indian Head Hwy (MD 210). At National Ave, turn west. Continue into National Harbor and terminate. Optionally connect to Virginia via the Woodrow Wilson bridge.

Outer Purple Line Extension (PLX2): Begin at New Carrollton Metro and continue southeast on Ardwick Ardmore Rd. Turn south on Brightseat Rd. At Sheriff Rd, continue south past FedEx Field to Garret Morgan Blvd. Connect with the Morgan Blvd Metro and continue south to Central Ave (MD 214). Continue south on Ritchie Rd. At Pennsylvania Rd (MD 4), continue south on Forestville Rd. At Allentown Rd (MD 337), turn southwest. Continue across Branch Ave (MD 5) and turn west on Brinkley Rd. Follow Brinkley Rd to Oxon Hill Rd (MD 414). Continue west along Oxon Hill Rd (MD 414) across Indian Head Hwy (MD 210). At National Ave, turn west. Continue into National Harbor and terminate. Optionally connect to Virginia via the Woodrow Wilson bridge.

Outer Purple Line Extension Alternate (PLX3): Begin at New Carrollton Metro and continue southeast on Ardwick Ardmore Rd. Turn south on Brightseat Rd. At the intersection of Brightseat Rd and Evarts St turn east and cross I-95 to connect to McHugh Dr. Continue south McHugh Dr to St Josephs Dr and cross Landover Rd (MD 202). Continue on McCormick Dr to Lottsford Rd. Turn south on Lottsford Rd and continue past the Largo Metro. Connect to Central Ave (MD 214) westbound and cross I-95. Turn south on Hampton Park Blvd. At Ashwood Dr, turn west. Turn south on Ritchie Rd. At Pennsylvania Rd (MD 4), continue south on Forestville Rd. At Allentown Rd (MD 337), turn southwest. Continue across Branch Ave (MD 5) and turn west on Brinkley Rd. Follow Brinkley Rd to Oxon Hill Rd (MD 414). Continue west along Oxon Hill Rd (MD 414) across Indian Head Hwy (MD 210). At National Ave, turn west. Continue into National Harbor and terminate. Optionally connect to Virginia via the Woodrow Wilson bridge.

Bladensburg-Takoma/Langley Park (BTL, BTL Alt): Begin at the District line (to be coordinated with the proposed DC streetcar line) and continue up US 1 (Rhode Island Ave). Turn southeast on 38th St to Bladensburg Rd (US 1A). Turn northeast on Bladensburg Rd and continue to the intersection with Annapolis Rd (MD 450). Follow Annapolis Rd east to Kenilworth Ave (MD 201). Continue north on Kenilworth Ave to East-West Highway (MD 410) and the Purple Line. Head west along East-West Highway to Riggs Rd (MD 212). Turn north on Riggs Rd and continue to University Blvd and the Purple Line. Continue west to

Takoma-Langley Crossroads and New Hampshire Ave (MD 650). In the alternative, rather than turn north on Riggs Rd, continue along East-West Highway to New Hampshire Ave (MD 650) and turn north, terminating at the Purple Line.

Penn-Westphalia 1 (PW1): Start at the District line and head southeast along Pennsylvania Ave (MD 4). Terminate at the Forestville Rd/Ritchie Rd.

Penn-Westphalia 2 (PW2): Start at Forestville Rd/Ritchie Rd and continue southeast along Pennsylvania Ave (MD 4) to Westphalia Regional Center and terminate).

Penn-Westphalie 3 (PW3): Start at the Westphalia Regional Center (just west of Woodyard Rd) and continue east along MD 4. Exit at Water St (MD 717) and terminate in Upper Marlboro.

Branch Ave (BA1): Begin at the Branch Ave Metro and continue south on Branch Ave (MD 5). Continue south to Woodyard Rd (MD 223). Terminate at the park and ride at Clinton Plaza.

Branch Ave (BA2): Begin at Woodyard Rd (MD 223) and continue south along MD 5 into Charles County.

National Harbor (NH, NH Alt): Begin at Southern Ave Metro station and travel southwest along Southern Ave SE to Indian Head Hwy (MD 210). Continue south along Indian Head Hwy (MD 210) south to Oxon Hill Rd (MD 414). Follow National Ave into National Harbor and terminate. Optionally connect to Virginia via the Woodrow Wilson bridge. In the alternate, begin at MLK Jr Ave SE at the terminus of the streetcar (or other location coordinated with the District) and continue south along South Capitol St SE into Maryland.

Original Corridors

Route 1A – US 1 North: Beginning just north of I-495, continuing north on US 1 (Baltimore Ave) to the MARC station in Laurel, just south of the Howard County line.

Route 1B – US 1 South: Beginning at the District line (to be coordinated with the proposed DC streetcar line) and continuing up US 1 (Rhode Island Ave/Baltimore Ave) until just north of I-495.

Route 2 – Konterra/Calverton: Begin near downtown Laurel at the intersection of Cherry Ln and US 1. Travel west along Cherry Ln to Van Dusen Rd and turn south. Follow Van Dusen Rd to Virginia Manor Rd and turn south. Travel through Konterra and continue south along Virginia Manor Rd. Continue southwest along Ammendale Rd and Powder Mill Rd. Turn north up Cherry Hill Rd and terminate at the FDA and/or Cherry Hill Employment Center (to be coordinated with Montgomery County). Alternate routing would be to turn north Beltsville Dr after crossing I-95 and continuing west along Calverton Blvd.

Route 3A – ICC: Begin at the Briggs Chaney Park and Ride (at the termination of the proposed Montgomery County ICC transit corridor). Continue east along the ICC serving Konterra and terminating at the Muirkirk MARC station.

Route 3B – Grenbelt-Konterra: Begin at Greenbelt Metro station and travel north along the railroad right of way. At the Muirkirk MARC station, turn west to Virginia Manor Rd. Follow Virginia Manor Rd into Konterra and terminate.

Route 4A – University Blvd/Adelphi Rd: Begin at PG Plaza Metro and head north on Belcrest Rd. Continue north on Adelphi Rd to University Blvd (MD 193). Follow University Blvd north around the UM campus to the intersection of Greenbelt Rd and Cherrywood Ln. Turn north on Cherrywood Ln and then west to terminate at the Greenbelt Metro. The route could optionally terminate at an infill station at Greenbelt Rd.

Route 4B – Greenbelt Rd (MD 193): Begin at Cherrywood Ln and continue east along Greenbelt Rd/MD 193. Terminate at the intersection of Glen Dale Blvd and Annapolis Rd (MD 450).

Route 5 – East-West Highway: Begin at the intersection of Kenilworth Ave (MD 201) and Annapolis Rd (MD 450). Continue north on Kenilworth Ave to East-West Highway (MD 410) and the Purple Line. Head west along East-West Highway to Riggs Rd (MD 212). Turn north on Riggs Rd and continue to University Blvd and the Purple Line. Optionally terminate or continue west to Takoma-Langley Crossroads and New Hampshire Ave (MD 650).

Route 6 – Annapolis Rd (MD 450): Begin at the intersection of US 1 and 38th St (near the DC line). Continue southeast on 38th St to Bladensburg Rd (US 1A). Turn northeast on Bladensburg Rd and continue to the intersection with Annapolis Rd (MD 450). Follow Annapolis Rd to its intersection with MLK Jr Hwy (MD 704). Continue east along Annapolis Rd to its intersection with Glen Dale Blvd (MD 193) and terminate.

Route 7A – Landover Rd (MD 202): Begin at the intersection of Landover Rd (MD 202) and Annapolis Rd (MD 450). Travel southeast along Landover Rd across I-95. Turn south on Lottsford Rd past the Largo Metro. Turn south on to Harry S Truman Dr. Turn east on Campus Way and terminate at the Prince George's Community College.

Route 7B – Largo Rd (MD 202): Begin at Prince George's Community College and travel south along Largo Rd. At Marlboro Pike (MD 725), head west and terminate in Upper Marlboro.

Route 8A – MLK Jr Hwy (MD 704): Begin at the intersection of Annapolis Rd (MD 450) and MLK Jr Hwy (MD 704). Continue southwest along MLK Jr Hwy to the Capitol Heights Metro station.

Route 8B – Southern Ave: Begin at the Capitol Heights Metro station and travel southwest along Southern Ave. At Branch Ave, head south to the Naylor Rd Metro. Turn northwest along Naylor Rd to return to Southern Ave. Continue southwest along Sothern Ave, past the Southern Ave Metro, and terminate at South Capitol St/Indian Head Hwy (MD 210).

Route 9 – US 50: Begin at New Carrollton Metro and head east along US 50. Head southeast along MD 197 and terminate at Bowie Town Center. This route will likely utilize the existing HOV lanes along US 50 and thus require limited additional infrastructure.

Route 10A – Brightseat Rd: Begin at New Carrollton Metro and continue southeast on Ardwick Ardmore Rd. Turn south Brightseat Rd. At Sheriff Rd, continue south past FedEx Field to Garret Morgan Blvd. Terminate at Morgan Blvd Metro.

Route 10Alt – Largo: This is an alternate alignment to be combined with 10A and 10B. It would begin at the intersection of Brightseat Rd and Evarts St and cross I-95 to connect to McHugh Dr. (This connection would likely occur after, or in cooperation with, the construction of the new overpass by others.) Continue south McHugh Dr to St Josephs Dr and cross Landover Rd (MD 202). Continue on McCormick Dr to Lottsford Rd. Turn south on Lottsford Rd and continue past the Largo Metro. Connect to Central Ave (MD 214)

westbound and cross I-95. Turn south on Hampton Park Blvd. At Ashwood Dr, turn west and terminate at Ritchie Rd.

Route 10B – Ritchie Rd: Begin at the Morgan Blvd Metro and head south toward Central Ave (MD 214). Continue south on Ritchie Rd. At Pennsylvania Rd (MD 4), continue south on Forestville Rd. At Allentown Rd, turn southwest and continue to Suitland Rd and the Andrews gate.

Route 11A – Central Ave (MD 214) west: Start at the District line and head east along Central Ave (MD 214). At Campus Way, turn south and terminate at the Prince George's Community College.

Route 11B – Central Ave (MD 214) east: Start at Campus Way and Central Ave (MD 214). Continue east and terminate at Hall Rd, just west of US 301.

Route 12A – Pennsylvania Ave (MD 4): Start at the District line and head southeast along Pennsylvania Ave (MD 4). Terminate at the Westphalia Regional Center.

Route 12B – Upper Marlboro/MD 4: Start at the Westphalia Regional Center (just west of Woodyard Rd) and continue east along MD 4. Exit at Water St (MD 717) and terminate in Upper Marlboro.

Route 13A – MD 458: Begin at Morgan Blvd Metro and head south to Central Ave (MD 214). Turn west and continue to Shady Glen Dr. Turn south on Shade Glen Dr. Continue southwest on Walker Mill Rd. Connect to Silver Hill Rd. (The current PCN corridor follows County Rd south to Old Silver Hill Rd and back west to Silver Hill Rd.) Terminate at the Suitland Metro.

Route 13B – MD 414/National Harbor: Begin at Suitland Metro and continue west on Silver Hill Rd (MD 458). Turn south on St Barnabas Rd (MD 414). Continue southwest across I-95 to Oxon Hill Rd (MD 414). Turn west along Oxon Hill Rd (MD 414) across Indian Head Hwy (MD 210). At National Ave, turn west. Continue into National Harbor and terminate.

Route 14 – Brinkley Rd/Allentown Rd: Begin at Westphalia Regional Center and head west along Suitland Parkway. Turn southwest along Allentown Rd (MD 337). Continue across Branch Ave (MD 5) and turn west on Brinkley Rd. Follow Brinkley Rd to Oxon Hill Rd (MD 414) and terminate.

Route 15A – Branch Ave (MD 5) north: Begin at the Naylor Rd Metro (or the District line) and head southeast along Branch Ave (MD 5). Head east on Auth Way to terminate at the Branch Ave Metro.

Route 15B – Branch Ave (MD 5) central: Begin at the Branch Ave Metro and continue south on Branch Ave (MD 5). Continue south to Woodyard Rd (MD 223). Terminate at the park and ride at Clinton Plaza.

Route 15C – Branch Ave (MD 5) south: Begin at Woodyard Rd (MD 223) and continue south along MD 5 into Charles County.

Route 16A – Indian Head Hwy (MD 210) north: Begin at MLK Jr Ave SE at the terminus of the streetcar (or other location coordinated with the District) and continue south along South Capitol St SE into Maryland. Continue along Indian Head Hwy (MD 210) south to Oxon Hill Rd (MD 414). Follow National Ave into National Harbor and terminate.

Route 16B – Indian Head Hwy (MD 210) south: begin at Oxon Hill Rd (MD 414) and continue south along Indian Head Hwy (MD 210). Terminate at the Fort Washington Park and Ride or Old Fort Rd.