

Southern Maryland Commuter Rail Service Feasibility Study

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EXECUTIVE SUMMARY

Study Scope and Approach

This study examines the feasibility of operating MARC commuter rail service on existing railroad rights-of-way from Bowie to Southern Maryland. The purpose of the study is to examine the existing facilities in a focused way and identify the possibilities, the challenges, and order-of-magnitude construction cost estimates to establish and develop commuter rail service.

The purpose of the study is to investigate the engineering-operating feasibility in order to advance the dialog on the viability of commuter rail service to Southern Maryland. Environmental analysis was beyond the scope of this study. Until such a study is made, there is always the possibility of an environmental fatal flaw.

The Prince George's, Charles, and St. Mary's counties of Southern Maryland are forecasting continued growth in both population and housing. While many people work locally, the attractiveness of affordable housing and a suburban/rural environment draws people who work in the Washington, DC area to live in Southern Maryland. This has created a transportation challenge for an area that has limited highway capacity and significant peak hour congestion.

This situation suggests a role for public transportation, possibly commuter rail transportation, in meeting the challenge. As of March 1, 2009, the available public transportation consists of commuter buses on six routes from Charles County and St Mary's County to Capitol Hill, downtown Washington, DC and L'Enfant Plaza.

This study focuses on rail service that uses existing or prior railroad rights-of-way. Existing tracks would be upgraded to accommodate passenger service operating at typical commuter rail speeds up to 80 mph and the existing rights of way would be expanded where necessary to meet the new demands of both passenger and freight service. Where there is no active rail line, new tracks would need to be constructed where the tracks have long since been removed, but generally, on a straighter, speedier alignment than the abandoned right of way.

Figure 1 displays the existing rail network in Southern Maryland. The existing railroad from Southern Maryland runs to Bowie, MD where the line joins the Amtrak main line to Washington. The railroad line between Bowie and Southern Maryland is a freight line owned and operated by CSX. Between Bowie and Washington, the Amtrak main line is part of the fastest, most well maintained railroad line in North America.

The circuitous existing railroad route between Southern Maryland and Washington via Bowie generally makes the train a slower option than if it had a direct route to Washington, DC.

Figure 1: Existing Rail Network in Southern Maryland



The former rail lines that connected Southern Maryland more directly with Washington, DC have been abandoned and built over. The cost of right-of-way acquisition to rebuild the railroad through the densely populated areas of Washington DC to reach Union Station, Downtown Washington, or even the Metrorail Branch Avenue station in Prince George's County, just inside the Capital Beltway, raises the price of this option beyond the realm of consideration.

As a result, this study limited its focus to assessing the feasibility of instituting commuter service along the existing rights-of-way.

Major Issues Associated with Southern Maryland Commuter Rail Service

Turning a lightly used freight line into a right-of-way appropriate for safe and competitive commuter train service is full of challenges because using the existing line for commuter service subverts the purpose for which the line was built and for which the line has been used so far. For example, the driving distance between Lexington Park and Washington DC is 60 miles, while the railroad distance between those destinations is 80 miles via Bowie. Similarly, the driving distance between La Plata and Washington is 30 miles by road and 55 miles by rail. For rail to be an attractive option, it must be competitive in terms of travel time with autos and commuter buses and therefore has to overcome the longer distances with greater speed. Achieving that greater speed will take a major upgrade to the lines in Southern Maryland.

The challenge of "beating the bus" can not be met without spending a considerable amount of money upgrading the railroad infrastructure. Inspection of the line verifies that the CSX-owned Pope's Creek Subdivision and the Herbert Subdivision are 30 mph freight lines with no automatic wayside signals or train control. The line is suitable for the coal trains that use it, but the line is not suitable for regular passenger operations without major improvements involving line speed, capacity, train control, and a suitable connection at Bowie. The final 28 miles to Lexington Park from the junction with the Herbert Subdivision to Lexington Park are not only abandoned but are almost untraceable.

That last fact altered the major focus of this study into an examination of what could be done with existing Southern Maryland rail lines, the Pope's Creek and Herbert Subdivisions, rather than simply developing a plan to reconstruct the non-existent rail lines in St. Mary's County.

Another major issue that needs to be worked out is creating a safe and effective connection to the Amtrak Main Line at Bowie interlocking for trains to Washington. An interlocking is the arrangement of switches and signals which allow a train to change tracks. The switches and signals are "interlocked" to prevent conflicting routes from being displayed. The way the interlocking is configured currently, a train can not physically reach the normal southbound track (Track 3) from the Pope's Creek Subdivision. Using Track 1 in both directions between Bowie and Carroll interlockings creates conflicts between existing northbound MARC Penn Line trains going back to Baltimore and the proposed Southern Maryland trains going to Washington. The problem of how to reach Track 3 is not solved by using Track 1 to Carroll or Landover interlocking because of the extended distance between Bowie and those locations. An infrastructure change at Bowie is required before this project can proceed. One option for infrastructure change is the relocation (or addition) of the switches at Bowie. Another option is the construction of a tunnel under the Amtrak main line so that the trains from Southern Maryland would emerge on the west (or Track

3) side of the Northeast Corridor. The tunnel is the preferred option because it eliminates conflicts with northbound trains at Bowie. However it is an extremely expensive option.

The negotiations with the railroad infrastructure owners, Amtrak and CSX, for the operating rights and costs, procurement of equipment, and provision for maintenance and layover will define both the projects and the costs that will be involved. Operating commuter service to Southern Maryland involves making improvements and operating trains on private property¹ and cannot succeed without the involvement of CSX and Amtrak.

This study is based on a basic service plan, which assumes the operation of three trains in the weekday peak periods between Southern Maryland and Washington Union Station. The service concept is similar to the current MARC Frederick service: three trains in the morning and three trains back in the evening, with no off peak or weekend service. The trains would be sized according to demand, most likely containing from three to five cars each. The service plan, however, will need further refinement to mesh the level of train service with the size of the ridership market and the availability of public resources to build and operate the service.

Locomotives and cars will need to be obtained or built for this service. The most likely equipment would be diesel-hauled push pull trains similar to what is operated on MARC's Camden and Brunswick Lines². The possibility of using Diesel Multiple Units (DMU) was raised when this service was proposed, but this option is not currently viable, since there is no longer any American manufacturer of DMU vehicles that comply with FRA crashworthiness standards. A yard facility for overnight storage and capable of handling routine maintenance of the equipment (daily servicing, cleaning, and running repair) should be located in Southern Maryland, to minimize the incremental costs of moving train sets to remote locations for maintenance, and in light of the capacity constraints that exist at the MARC and Amtrak maintenance facilities in Washington, DC.

Depending on the route or routes chosen for commuter rail development, potential stations could include Bowie Town Center, Upper Marlboro, Brandywine, Waldorf, La Plata, Gallant Green, Hughesville Junction (Jct), Hughesville, Charlotte Hall, Orville, California, and Lexington Park.

Order-of-Magnitude Capital Costs

The costs summarized below are conceptual order of magnitude neat construction costs developed from recent comparable projects. As such they are more illustrative than definitive. As Total Program Costs are developed when specific construction projects are defined, the cost will be higher, possibly as high as a factor of two. Because there are different possibilities in structuring Southern Maryland Commuter Service, the capital costs have been organized by rail line segment to facilitate a building-block approach in analyzing different service plans. These costs will bear further scrutiny as this project would move to preliminary engineering or an in depth study of the line or segments of it.

Significant capital investment is required to prepare the railroad for passenger trains that are fast enough to "beat the bus." The order-of-magnitude capital costs for infrastructure, stations, and equipment are shown in **Table 1**.

Table 1: Order of Magnitude Costs

Line Segment	Required Improvements	Longer Term	Total
Northeast Corridor	\$ 25,000,000	\$110,000,000	\$135,000,000
Bowie-Brandywine	\$170,000,000	\$130,000,000	\$300,000,000
Brandywine-La Plata	\$125,000,000	\$65,000,000	\$190,000,000
Brandywine-Hughesville Jct	\$ 90,000,000	\$50,000,000	\$140,000,000
Hughesville Jct-to Lexington Park	\$580,000,000		\$580,000,000
Equipment Procurement	\$ 40,000,000	\$30,000,000	\$ 70,000,000
Equipment Maintenance Facility		\$25,000,000	\$ 25,000,000
Total	\$1,030,000,000	\$410,000,000	\$1,440,000,000

Conclusions and Recommendations

The overall conclusion of the study is that commuter rail service between Southern Maryland and Washington, DC is potentially feasible but would be costly and difficult to implement. Introduction of service is not possible in the immediate near term, because of issues relating to the lack of available train equipment in the MARC inventory, the awkward existing configuration of tracks at Bowie where the Popes Creek Branch meets the Amtrak main line, and the lack of suitable existing midday and overnight storage locations for the Southern Maryland train sets. Over the longer term, these issues are resolvable. However, the project can only happen following the successful conclusion of negotiations with both CSX and Amtrak over required capital investments, operational details, and fees for access to the tracks owned by these railroads. Both railroads have a history of working cooperatively with the State of Maryland to support commuter rail service, but both railroads also will not permit any new service to operate until sufficient capital investment is made to ensure that the operational needs of freight and intercity passenger rail have been protected. Any expansion of commuter rail service to Southern Maryland will be contingent upon identifying sufficient financial resources to make the project happen, consistent with the State's Rail Plan.

For commuter rail to be viable, it must "beat the bus" in terms of trip time and convenience. Though the circuitous rail route to Washington, DC poses a challenge, the rail route could be upgraded to permit high enough train speeds to make travel times competitive by rail to downtown Washington, DC and the Union Station area. Commuter rail cannot come close to beating the bus given the slow-speed and unsignalled condition of the Pope's Creek and Herbert Subdivisions. Therefore, considerable investment in railroad infrastructure would be required to make the railway safe and effective for passenger rail service that is time competitive with either driving or commuting by bus.

The presence of heavily-patronized commuter bus service between Southern Maryland and Washington, DC, coupled with strong regional growth forecasts and increasing traffic congestion, are indicative that there is a potential market that could be served by commuter rail. Since the existing bus services serve areas of Washington, DC that are different from those potentially served by commuter rail, commuter rail is seen as a supplement to – not a replacement for – these

commuter bus operations. Detailed market studies and travel demand forecasts will be necessary to determine the magnitude of potential commuter rail ridership.

With appropriate capital investment, commuter rail service would be physically and operationally feasible along the Pope's Creek Branch to at least La Plata in Charles County. Likewise, commuter rail service would be feasible on the Herbert Subdivision as far as Hughesville Junction. Ridership demand is unlikely to be sufficient to support commuter rail service simultaneously to both La Plata and Hughesville Junction. Therefore, an alternatives analysis would be required to determine which of the two potential lines would be most beneficial and cost-effective.

Because of the current conditions along the former St. Mary's County right-of-way, this study concludes that extending commuter rail service beyond Hughesville Junction on the eastern rail route would be impractical – as it would entail a level of capital investment and local impact significantly higher than for the portions of right-of-way further north where existing railroad tracks remain.

Any new commuter rail service would require the acquisition of additional train equipment – both locomotives and passenger coaches – since MARC has no spare equipment that could be devoted to such service.

Both CSX and Amtrak would have operating and policy concerns that would need to be addressed to their satisfaction prior to the start-up of commuter rail service. In the final analysis, the true costs will be driven by the negotiations with the line owners, in which capital investments and operating agreements would be identified. Before this project can proceed, discussions and negotiations with Amtrak and CSX will need to be initiated –to set up the framework for the necessary operating agreement to run the service and define the capital requirements more precisely.

Finally, investment in commuter rail service within the Southern Maryland corridor will need to be evaluated by MTA and weighed against other investment needs, in the context of its statewide mission and core service.

INTRODUCTION

Historical Context

The plans for a railroad to Southern Maryland predate the Civil War. The Maryland General Assembly chartered the Baltimore and Potomac Rail Road (B&P) to construct a railroad from the city of Baltimore via Upper Marlboro to the Potomac. The most important part of the railroad's charter was the provision that the B&P could construct branch lines 20 miles long from any point and in any direction from the B&P's main line to Southern Maryland. Therefore, when the B&P's main line reached Bowie, they were within 20 miles of Washington and immediately built a branch line into the District, ending the Baltimore & Ohio's (B&O) monopoly of rail service in the nation's capital.

Initially, the railroad was built in order to gain access to Washington, DC and break the monopoly on traffic that the Baltimore & Ohio enjoyed since 1835. This Baltimore & Potomac line from Baltimore to Washington via Bowie is now the Amtrak Northeast Corridor. The B&P line between Bowie and Pope's Creek, now the CSX Pope's Creek Subdivision, opened on January 1, 1873. The Southern Maryland Railroad was incorporated on March 20, 1868 by the Maryland General Assembly "for the purpose of constructing, maintaining a railroad from a point to be determined in Prince George's County to Point Lookout." (The State of Maryland was the sole stockholder in what can only be described as an early public-private partnership.) The "point to be determined" depended on how the B&P was built through Prince George's County. As it happened, that point turned out to be Brandywine. As it happened, the Southern Maryland Railway went bankrupt before it ran a single train. Its charter would be carried on by others.

The short line railroads in Southern Maryland existed to help farmers and planters get their produce to a wider market. Agricultural products can be an unstable traffic base and so the history of the Southern Maryland railroads contains many bankruptcies and reorganizations. The most stable period in their history was during World War II and the years immediately following. For most of that time, the US Navy operated the Branch in St. Mary's County directly. The exception to the perpetual hard times was the Pope's Creek Branch which, at that time, was tied to the economic giant, the Pennsylvania Railroad (PRR).

The Brandywine and Cedar Point, the line under consideration for reconstruction to St. Mary's County, was closed in 1954 from the Naval Station to Hollywood. The PRR used the right-of-way to deliver aviation fuel to the Naval Air Station. When the fuel began to come by barge, the line was effectively abandoned. On June 26, 1970, the St. Mary's County Commissioners purchased 28 miles of abandoned right-of-way between Hughesville and the naval base. The tracks were removed in the mid-1970's.

A rail line in an urban-suburban area is a potential resource for public transportation because the infrastructure necessary to support commuter rail or light rail generally is, at least in part, already in place. The issues involved in realizing the potential for a commuter rail operation generally center on capital costs and line capacity.

It is easy to underestimate the complexity of a commuter rail startup and railroad operations in general. The very existence of tracks and the potential availability of equipment make development of commuter operations a deceptively simple matter. While no new commuter rail service is ever a "slam dunk," some options are more realistic than others. The best chances for

success rest with an operating plan that uses railroad right-of-way that is already used for passenger service and where institutional arrangements are already in place with the owners and operators.

A lightly used freight rail line usually requires considerable capital investment in track, signals, and grade crossing elimination before it is suitable for passenger operations. Conversely, a well used existing railroad main line usually presents capacity issues, requiring capital expenditures to provide additional tracks, signals, and switches to replace the capacity that the commuter rail operation consumes. Both cases apply in the study area. In either case, adapting an existing rail line for commuter service is generally less costly and less cumbersome than constructing a completely new right-of-way, particularly in an urban or suburban environment.

Definitions

In order to understand how commuter rail service differs from the other passenger rail transportation modes that exist in Maryland and Washington, DC, a comparison of the fundamental characteristics of these various modes is useful. Several passenger-moving methods use a steel wheel-steel rail technology. Each is distinct in terms of regulations, costs, and operating practices.

The Federal Railroad Administration (FRA) regulates the national rail network, which includes all of the railroad lines under consideration in this study. FRA clearly makes distinctions among the several rail passenger modes, taking the regulatory position that light or heavy rail transit must either operate on separate lines or, if on the same line, operate at different times of day. This separation by time of day is how the Baltimore Light Rail operated while the Norfolk Southern was still serving freight customers on the line to Cockeysville. As a practical matter, for a mixed-use line (i.e. passenger and freight) like the CSX Pope's Creek Subdivision in Southern Maryland or the Amtrak Northeast Corridor, light rail operations cannot be considered, and the options for passenger rail service are restricted to some form of commuter rail. The distinctions among modes are as follows:



Commuter rail train

Commuter rail is defined by the American Public Transit Association as short-distance passenger service generally operated over a rail network to provide transportation between a central city and adjacent suburbs. Typically, commuter rail operates in a mixed-use environment that includes other passenger or freight operations. Its success is measured in terms of passenger miles, rather than total passengers. Commuter rail comes under the oversight of the Federal Railroad Administration (FRA) for safety and operating practices and under the Federal Transit Administration (FTA) for funding.



Amtrak train

Intercity passenger rail describes the city-to-city operations such as that operated by the National Railroad Passenger Corporation (Amtrak), either on its own tracks or by contract arrangements with freight railroads over their tracks. Amtrak can also be engaged as a contract operator of commuter service.



Light rail trains

Light rail typically refers to lighter weight passenger rail cars, generally operating on its own right-of-way or separated by time from other railroad operations. Unlike commuter rail, light rail may be mixed with other vehicular traffic on city streets. Compared to commuter rail, light rail has more closely spaced stations; more frequent service, and shorter routes. Some light rail lines are developed wholly or partly in abandoned railroad rights of way; the Baltimore light rail system is an example.



Heavy rail train

Heavy rail transit generally applies to subways and elevated lines that use heavier equipment than light rail and operate on a dedicated right-of-way, separated from vehicular traffic and not connected to other rail lines. Heavy rail lines usually operate in very high density corridors and have the highest throughput, in terms of passengers per hour, of any form of transit. The Washington Metropolitan Area Transit Authority (WMATA) Metrorail is an example of heavy rail transit.

Previous and Related Work

There are six prior studies that have particular relevance to establishing commuter rail. They are:

1. "Relocation Study for a Railroad Right-of-Way in St. Mary's County prepared by Barton Ashman Associates, Inc for the Board of County Commissioners of St. Mary's County, 1974. This report identified right-of-way requirements and evaluated alternative routings for the railroad right-of-way due to the widening of Route 235. The report recommended that the alternate railroad right-of-way be 120 feet wide with 50 feet reserved for utility use. The report noted that there may be a long range possibility of public transportation services in the railroad corridor. The report suggested short range uses such as a utility corridor and recreational use.
2. "An Examination of the St. Mary's County Railroad Right-of-Way" conducted by Dr. Craig W. Colton, Ph.D. of the University of Maryland, 1975-76. This study was the last detailed inspection of the right-of-way and included telephone interviews, direct interviews, focused questionnaires and correspondence related to the right-of-way. 352 people were interviewed; 80% responded that the right-of-way should be used for recreational and open space purposes.
3. "Maryland Statewide Commuter Assistance Study, Corridor 14B Southern Maryland to Washington" conducted by COMSIS in cooperation with Parsons Brinckerhoff for the Maryland Department of Transportation, 1990. This study recommended an alternatives analysis, environmental assessment and project planning study of transit options. The options considered at that time included light rail, heavy rail (see definitions), bus way, HOV, and express bus) between Charles County and the future WMATA Green Line terminal at Branch Avenue.
4. "Southern Maryland Mass Transportation Alternatives Study, prepared for the Tri-County Council for Southern Maryland and the Mass Transportation Steering Committee by COMSIS Corporation in association with Parsons Brinckerhoff, 1996. This study evaluated different transportation approaches including light rail, bus, and HOV lanes. The study made no recommendations.
5. "US 301 South Corridor Transportation Study Task Force Final Recommendations," 1996. This was a 75 member task force staffed by Maryland Department of Transportation (MDOT) to study transportation and related issues along 50 miles of US 301 from US 50 to the Potomac River Bridge at Morgantown. The study included the Route 5 Corridor between Branch Avenue and Brandywine. The study recommended that MDOT should identify and preserve a right-of-way for light rail in the Route 5/301 corridor, but concluded that the density of existing and projected land use was insufficient to justify light rail, even under the most favorable conditions.
6. "Hughesville to Lexington Park Right-of-Way Preservation Study" prepared for the Maryland General Assembly pursuant to Chapter 594 of the Acts of 1998 by Maryland Department of Transportation. There were a number of short term and longer term recommendations aimed at preserving the right-of-way for some future use based on some future consensus.

In addition to these studies, there is also the "Freight Railroad Realignment Feasibility Study" commissioned by the National Capital Planning Commission (NCPC), conducted by Parsons Brinckerhoff, and completed in 2007. This study investigated possible alternative routes for freight trains, avoiding the CSX main line through Washington, DC. One of the reroutes studied involved, in part, upgrading the current CSX Pope's Creek Branch to a signaled, main line railroad with connections to the Amtrak NEC near Bowie and the CSX Camden Line near Savage.

Each study was useful, but none of these studies specifically addressed the issues associated with the start-up of commuter rail service to Southern Maryland. To date, an assessment of the potential size of the ridership market for commuter rail service has not been undertaken, and none of the previous studies estimated the required cost of railroad right-of-way rehabilitation or improvement for passenger service.

Except for the NCPC study, the data contained in the earlier studies was at least eight years old. Some of the most detailed data for the former right-of-way in St. Mary's County was over 30 years old and the passage of time and continued development of the area have made the data irrelevant.

Study Background and Approach

This study began with the directive to assess the feasibility of providing commuter rail service between St. Mary's County and Washington, DC using the 28 miles of abandoned Brandywine and Cedar Point Railroad right-of-way owned by St. Mary's County. This study investigated this corridor and determined the suitability of the former right-of-way for reinstitution of passenger rail service, reconnecting to the existing railroad, the CSX Herbert Subdivision north of Hughesville at a place this study identifies as "Hughesville Junction."

Earlier studies also focused in broad or in specific detail on the St. Mary's County portion of the right-of-way. However, as shown on **Figure 2** (Existing Rail Network in Southern Maryland) other opportunities also exist for transporting Southern Maryland residents to Washington, DC jobs by commuter rail. Therefore, MTA adjusted the focus of this study to examine a broader array of options and opportunities with the objective of assessing the overall feasibility of providing commuter rail service between Washington, DC and the Southern Maryland region encompassing St. Mary's, Charles, and southern Prince Georges Counties.

This feasibility study was conducted at too high a level for environmental analysis. It cannot be assumed that, because no environmental fatal flaws were apparent in this study, none exist. The purpose of the study was to identify the engineering and operational feasibility and advance the dialog on the viability of commuter rail as a viable public transportation option in Southern Maryland.

Figure 2 - Existing Rail Network in Southern Maryland



Analysis of St. Mary's County Railroad Right-of-Way

Early field investigation revealed that the final 28 miles, the abandoned right-of-way of the Brandywine and Cedar Point Railroad from the junction north of Hughesville to Lexington Park were not simply abandoned but all traces of the right-of-way were obliterated save for a few mile posts and whistle boards, wayside signage for a long gone right-of-way. A short stretch, approximately four miles is now Phase I and Phase II of Three Notch Trail, a St. Mary's County Rails to Trails project. And, the former right-of-way clearly demonstrated that, even in its prime, the rail line was only suitable for slow speed local service.



"MP25" on the abandoned right-of-way in an athletic field near New Market.

The field inspection resulted in the following conclusions:

- The railroad right-of-way in St. Mary's County no longer exists. No bridges, structures, or roadbed remain. In some cases the land has been encroached upon and in others it has been transferred to other uses, including a popular hiker-biker trail.
- If right-of-way did exist, for the most part the curvature and alignment would not be suitable for commuter rail service at greater than 30 mph speeds and in some cases speeds as low as 10 mph.
- There are many road crossings and some street running associated with the old alignment, increasing the accident exposure and rendering the old alignment unsuitable for passenger service, which was never intended anyway.

In sum, this analysis suggests that if commuter rail is desired for this specific area it would be better to build it on a new right-of-way suited to its purpose and not follow the alignment of the abandoned right-of-way. Without a clear and proposed route, environmental analysis would be premature. Therefore, the decision was made to expand the scope of the study to the existing rail network between Washington and the larger Southern Maryland region.

THE COMMUTER RAIL MARKET

There are several market-driven imperatives for a successful commuter rail service:

- Strong underlying travel demand, primarily during the weekday morning and evening peak periods, between suburban areas and the central business district
- Trip times that are predictable and competitive with other modes of transportation, including automobile and bus
- Adequate parking capacity at outlying stations
- Service frequency and reliability sufficient for the train to be considered convenient by its users
- The fare must reflect the customer's perception of the value of the service.

Given the history of success with the Southern Maryland commuter bus services, the ridership on these routes is a reasonable proxy for the overall level of demand for public transportation service between Southern Maryland and Washington, DC. **Figure 3** provides a map of the current commuter bus service as of March 1, 2009.

Commuter bus demand will not be directly translatable into commuter rail ridership. The commuter bus system has the flexibility to stop in more places than a commuter rail system that is tied directly to railroad infrastructure. On the other hand, rail modes have been shown to attract higher modal shares than buses in corridors where the service is comparable. The destinations within Washington, DC that are well served by commuter buses (e.g., workplaces on the south side of the mall and along the Metrorail Green Line) are not the same as those that would be well served by commuter rail (the Union Station vicinity and the portions of downtown Washington, DC served by the Metrorail Red Line, which directly serves Union Station).



The Park & Ride at Mattawoman-Beantown, is almost full with approximately 740 daily boardings on commuter bus.

Figure 3 is map of the current commuter bus service as of March 1, 2009.

Figure 3: Existing MTA Commuter Bus Service

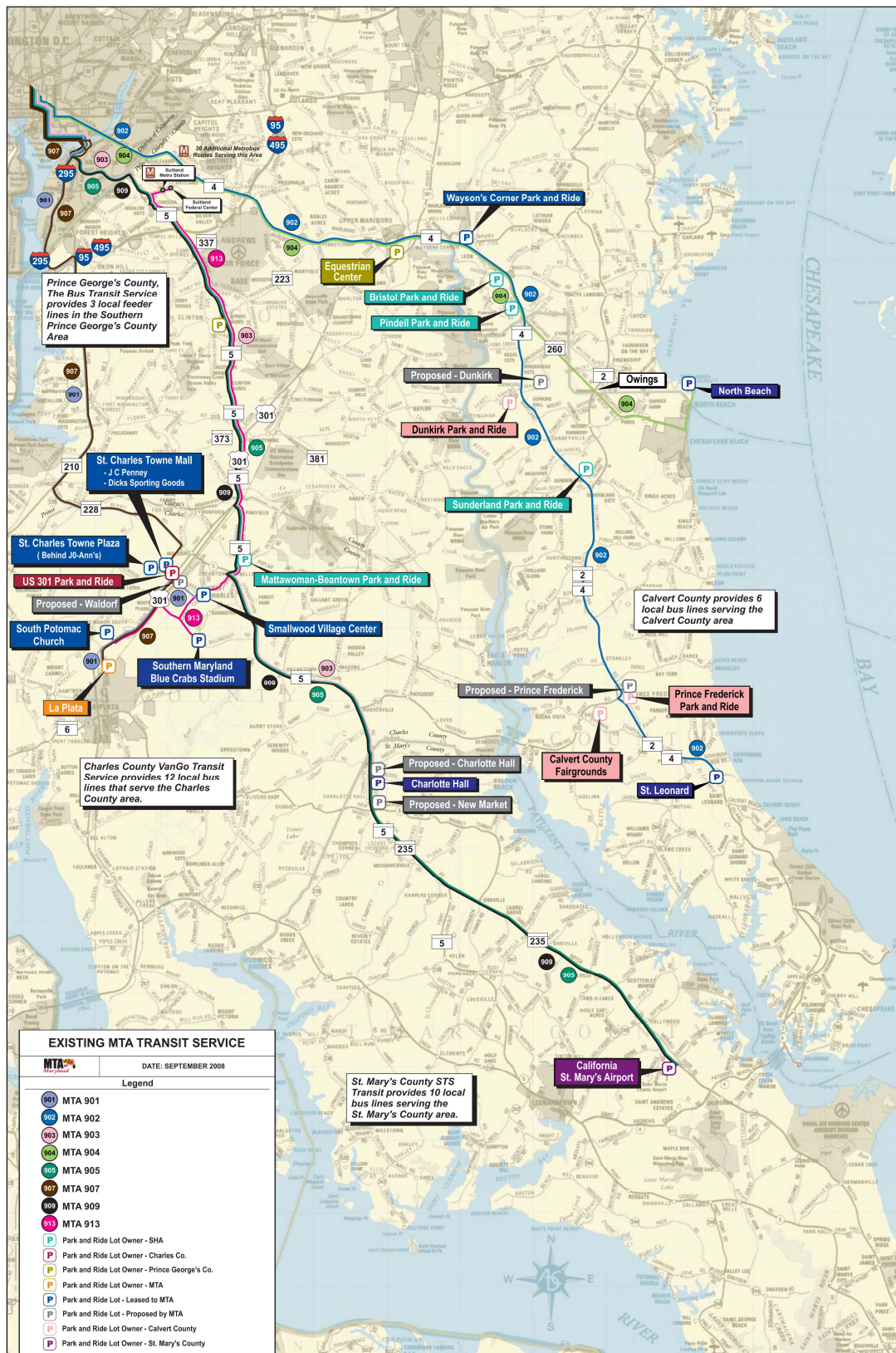


Table 2 shows the usage for the Park & Ride lots in Southern Maryland.

Table 2: Park & Ride lots in Charles & St. Mary's Counties

Park & Ride Lots	Line(s)	FY 09 Average Daily Ridership
St. Leonard (Crossroad Church)*	902	120
Charlotte Hall	903,905,909	590
La Plata	901,907	180
South Potomac Church	901,907	125
U.S. 301	901	540
St Charles Towne Mall (JC Penney)	901	270
St Charles Towne Mall (Dick's)	901	210
St Charles Towne Plaza (Jo Ann's)	907	205
Smallwood Village Center	901	80
Mattawoman-Beantown	903,905	740
	Total	3,060

* - Calvert County Park & Ride, but within the anticipated market shed of the Southern Maryland Park & Ride lots

The stations and boarding numbers presented above represent the Park and Ride lots located within Charles and St. Mary's Counties, most of which are near existing and potentially operational rail lines. Ridership is generally counted in terms of "trips". The 3,000 patrons using the bus service make a round trip per day, which equates to about 6,000 daily trips.

This level of daily public transportation ridership provides a useful benchmark for scaling the overall size and extent of a Southern Maryland commuter rail service. Absent formal travel demand modeling and an actual forecast of rail passenger volumes, this study assumed that a commuter rail service would be sized to handle the same order of magnitude of ridership as the existing commuter bus system – recognizing that the buses and trains would serve somewhat different geographic markets, future regional growth will increase the magnitude of total trip-making from the region to the Washington central business district, the basic characteristics of rail and bus service would tend to attract different sets of riders, and not all bus patrons would be divertable to the train.

With rail as an option, some commuters would choose rail who would never consider a bus, providing that the marketing imperatives presented above are fulfilled. On the other hand, rail would never totally replace the commuter buses because some will still prefer the bus for its convenience either to the passenger's origin or destination. The experience of the MARC Frederick Branch illustrates this point. As of early 2009, MTA commuter buses board approximately 350 passengers for Washington each morning at the Monocacy station in Frederick County, spread over 11 trips. The three MARC trains that operate on a somewhat more circuitous route to Washington board about 250 passengers at Monocacy. At first glance, it appears that the

market potential for Southern Maryland commuter rail service could roughly mirror that experienced in Frederick County.

Table 3 shows what the overall MARC system ridership picture (with Southern Maryland Service) would look like based on the assumption that commuter rail ridership from Southern Maryland would fall somewhere in the range of 50% to 100% of the current volume of commuter bus ridership.

Table 3: Assumed Ridership for Existing & Potential Lines

Line	Daily Trips
Penn Line	19,000
Camden Line	4,500
Brunswick Line	7,000
Southern Maryland	3,000 – 6,000
Total	33,500 – 36,500

The passenger volumes shown in the preceding table for Southern Maryland represent an allowance for system sizing and costing purposes, not a forecast of anticipated actual demand. This analysis is cursory and based on assumptions about travel demand that are unsubstantiated. Clearly, if interest in pursuing commuter rail on this corridor continues, a more rigorous analysis of the market would be required to support application for federal transit or railroad funds, as well as to justify state funding of the project.

CAPITAL INVESTMENT REQUIREMENTS BY RAILROAD SEGMENT

This section describes the physical characteristics of rail lines. The capital improvements required to institute commuter rail service are described, including estimated costs. These costs represent capital costs only and do not include the costs of project development, including project planning or design.

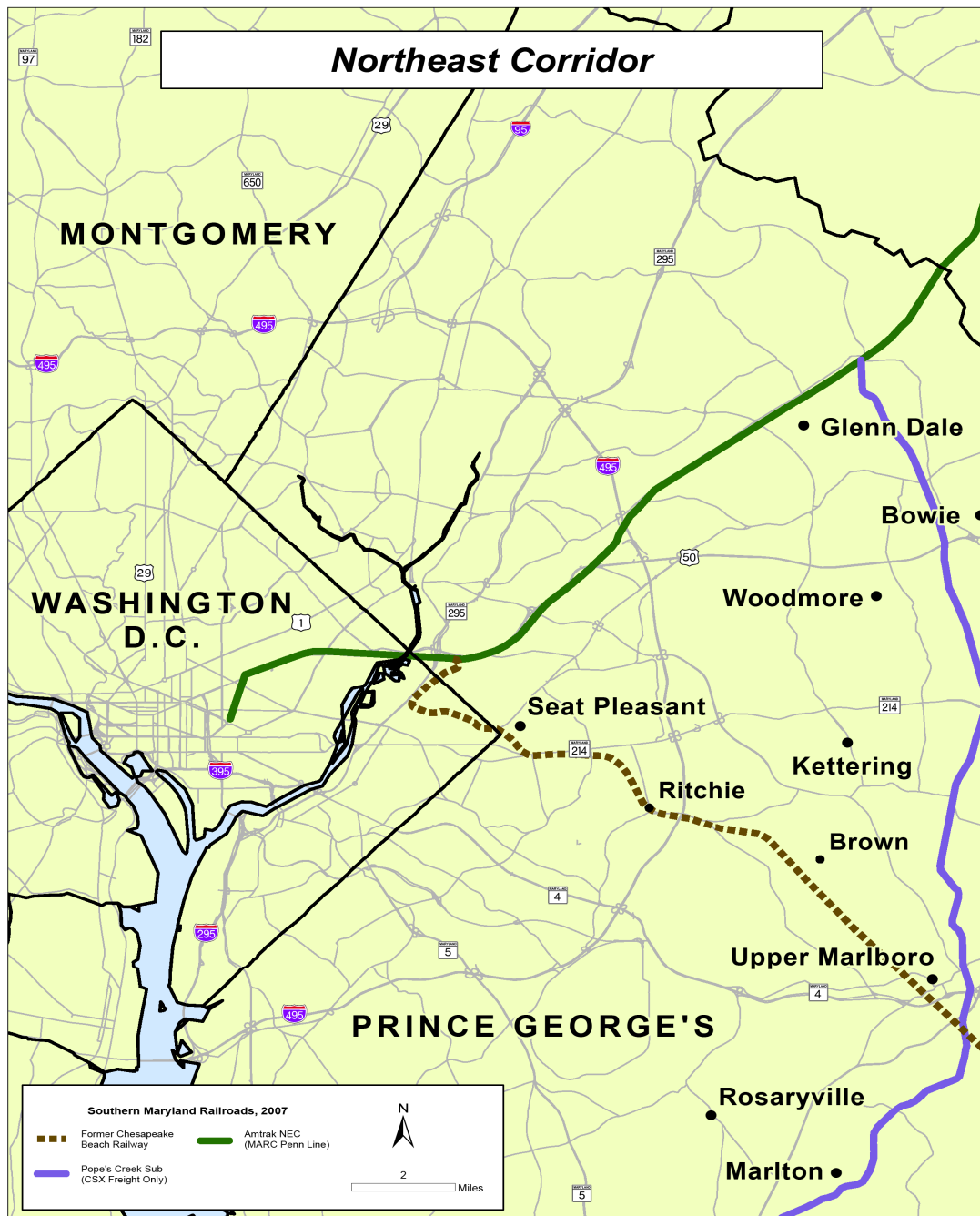
Railroad geography is usually expressed in milepost locations from a start point to an endpoint, often with some distinctive designation. This report identifies both the milepost locations and geographic designations. The railroad milepost location is necessary to aid the railroad staff in the identification of the site under discussion.

The railroad between Union Station, Washington, DC and Southern Maryland needs to be considered in five distinct sections, which range from one of the busiest rail line segments in North America to a former single track railroad right-of-way that is left without a trace.

The following is a description of these five segments:

- Segment 1: Washington to Bowie – Amtrak Northeast Corridor (shown in **Figure 4**)
- Segment 2A: Pope's Creek Northern Subdivision (shown in **Figure 5**)
- Segment 2B: Pope's Creek Southern Subdivision (shown in **Figure 6**)
- Segment 3: Herbert Subdivision (shown in **Figure 7**)
- Segment 4: Lexington Park Subdivision (shown in **Figure 8**)

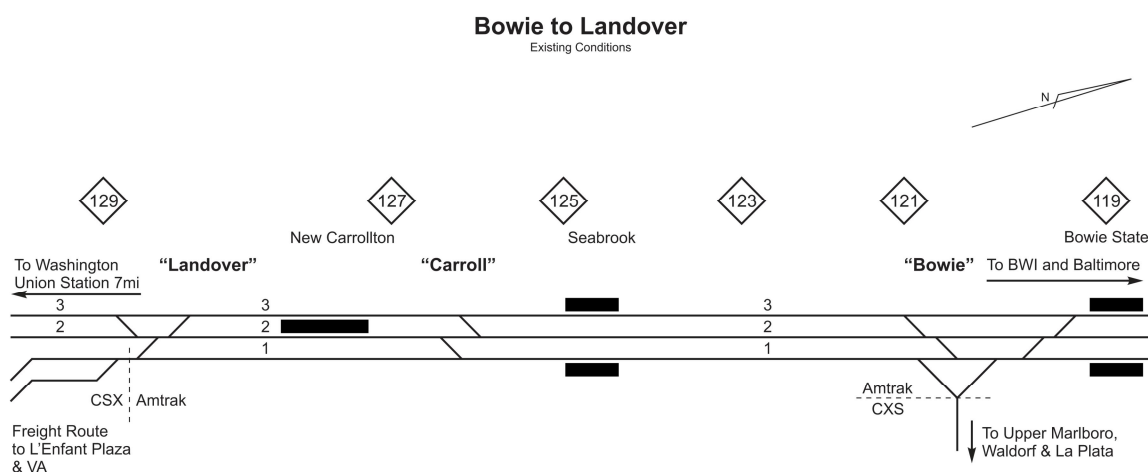
Figure 4: The Washington to Bowie—Amtrak Northeast Corridor



Segment 1: The Washington to Bowie – Amtrak Northeast Corridor

The line, which stretches from Union Station in Washington, DC to Bowie, MD (at a distance of 15.5 miles), is part of Amtrak's Northeast Corridor. It runs from milepost 120.5 to milepost 136.0. (The miles are measured from Philadelphia, PA.) The line handles nearly 100 Amtrak trains each weekday and 50 MARC Penn Line trains, as well as CSX coal trains and empty returns to the Pope's Creek Branch. The maximum authorized speed between Bowie and Washington is 125 mph. The track exceeds FRA Class VI³. There are no highway crossings at grade on the Northeast Corridor.

There are three main line tracks between Bowie and New Carrollton, as shown on the figure that follows.



This layout was finalized in its present form in the 1940's, long before there was any significant commuter service or high speed trains between Baltimore and Washington. The station at New Carrollton and "Carroll" interlocking were Northeast Corridor Improvement Plan (NECIP) projects in the early 1980's to replace the Capital Beltway station, accommodate Amtrak Metroliners and more frequent MARC service, and link the intercity and commuter rail network with WMATA's Metrorail.

Increased rail traffic over the years has created capacity challenges for the line's owners and operators. The current three track segment was once a two-track segment until World War II passenger and freight traffic necessitated a third track to Landover. Today, a fourth track to Landover and a third track to Washington are under consideration because of the need for more track capacity for passenger trains. In its current configuration, there is very limited platform space and track capacity between Washington and Bowie, and that creates a challenge for this new service.

Another challenge is that the capacity for additional trains at Washington Terminal is very limited because of the increase in train traffic in Washington Terminal. Amtrak, MARC, and Virginia Railway Express have all grown their business in the last twenty years, while the terminal trackage was reduced by six station tracks in conjunction with the building of Washington Metro.

The Pope's Creek Branch is used almost exclusively for coal traffic and empty returns to the power plants at Morgantown, the end of the Pope's Creek Branch or Chalk Point, the end of the Herbert Subdivision. Under PRR, Penn Central, and Conrail direction, the flow of coal came from the north, entering the main line at Perryville and traveling down the Northeast Corridor, through the Baltimore tunnels to Bowie. The switches at Bowie Interlocking were set up in their current configuration in 1984 to expedite coal traffic coming down from Baltimore to the Pope's Creek. That all changed with the CSX acquisition of large portions of Conrail in 1999. Under CSX's direction, the coal traffic was rerouted so that the coal trains now approach Bowie from the south, from Benning Yard in Washington, D.C. through the connection at Landover.

The way the connection at Bowie is laid out today as illustrated above presents several challenges. First of all, two of the main tracks are generally used by the high speed Acela trains. Those two tracks are track 2 and track 3. Track 2 is normally for all northbound Amtrak trains to Baltimore and beyond; track 3 is for all southbound trains to Washington. Northbound MARC trains and freight trains in both directions generally use track 1. Southbound MARC trains will use track 3 for most of the morning rush hour because most of the southbound MARC Penn Line trains have already operated into Washington before the first Southbound high speed Acela trains operate in the territory.

The current physical layout is such that the Pope's Creek can only be accessed from Washington and the south by using Track 1. The same applies to movements from the Pope's Creek towards Washington, DC. Because there is heavy Amtrak (and MARC) traffic through Bowie in the peak travel hours, the current track layout at Bowie presents train routing problems for southbound commuter operations coming off the Pope's Creek at Bowie and operating to Washington, DC.

The present situation effectively prevents a Southern Maryland to Washington service via Bowie, unless changes are made to the layout at Bowie. One potential remedy would be to relocate the current switches (or add switches) further south and upgrade them for higher speeds while upgrading the South Leg of the Wye track at Bowie to accept a higher speed. Such a project would allow a direct movement (in railroad terminology, a "straight shot") to be made southward from the Pope's Creek Branch South Leg of the Wye to Tracks 2 or 3. This would mitigate but would not altogether eliminate the routing problems caused by southbound Southern Maryland trains having to cross over the northbound tracks at grade at Bowie – in the face of northbound and MARC Penn Line traffic. These types of crossover movements decrease the overall capacity of the railroad and increase the likelihood of train delays occurring, as some trains wait for other trains. A higher-cost option that would eliminate the routing problem would involve construction of a tunnel under the Amtrak Main Line south of the junction at Bowie – to enable trains from Southern Maryland heading towards Washington come to pass beneath Amtrak's high-speed tracks and join the southbound main track (Track 3) without conflicting with northbound main line trains.

The grade on the Pope's Creek Branch ascends from Annapolis Road ("Coll" in the railroad timetable) to meet the Northeast Corridor at Bowie. Working with the grade, a cut could be dug that would pass under the Northeast Corridor at Bowie. This is similar to track layouts in Paoli, PA and Rahway, NJ that handle heavy volumes of trains in various directions. It should be mentioned that these other examples occur in places where there is a much higher volume of passenger trains than what is expected for Southern Maryland.

The following improvements must be made as a precondition before Southern Maryland Commuter rail service can begin, even on a limited basis.

- The connection at Bowie must provide for a move from the South leg of the Wye Track to Track 3. This involves moving the current switches or installing a new interlocking.
- The speed around the South Leg of the Wye must be raised from the current 10 mph to 45 mph or the highest speed the track geometry will allow.
- Provisions for equipment storage at Washington or a nearby alternative location would have to be found or made.

Table 4 and **Table 5** show the range of capital costs that would need to be incurred along the Northeast Corridor for Southern Maryland commuter rail service to be initiated. The extent to which additional capacity improvements would be needed on the Northeast Corridor to accommodate additional commuter trains from Southern Maryland will need to be determined based on detailed operational analyses of projected future train operations on the Corridor – and will be determined through negotiation with Amtrak. Required costs could increase if analysis shows that additional rail infrastructure is needed to mitigate any demonstrated negative impact of Southern Maryland service on Amtrak and MARC Penn Line train delays and service reliability.

Table 4 - Summary of Capital Costs - Low End of Range (Mandatory) - Northeast Corridor

Improvement	Estimated Capital Costs (2009 Dollars)
1. Connection at Bowie	\$18,000,000
2. South Leg of Wye	\$ 7,000,000
3. Midday Storage	TBD
TOTAL	\$25,000,000 +

Table 5 - Summary of Capital Costs - High End of Range - Northeast Corridor

Improvement	Estimated Capital Cost (2009 Dollars)
1. Connection at Bowie	\$18,000,000
2. South Leg of Wye	\$ 7,000,000
3. Midday Storage (Washington vicinity)	TBD
4. Connection to Track 4, via Undergrade tunnel	\$110,000,000
5. Additional main line track capacity	TBD
TOTAL	\$135,000,000 +

As another scenario to making an improved railroad connection between the Pope's Creek Branch and the Northeast Corridor at Bowie, the study considered the possibility that the Southern

Maryland trains could originate and terminate at Bowie while the passengers change trains between the Southern Maryland trains and the MARC Penn Line trains at Bowie.

In order to make this scenario happen, two things are involved. The first is the construction of two or three stub end station tracks perpendicular to the Northeast Corridor and the second is the construction of a more elaborate Bowie Station with ramps, elevators/escalators to facilitate the transfer of passengers.

From a pure railroad operations and engineering point of view, this scenario has some attractive aspects. For example, it would save the expense of reconfiguring the connection at Bowie (See Tables 4 and 5 above). A transfer at Bowie would eliminate the necessity of having a new station on the branch, which is identified as the Bowie Town Center. It would open up the equipment selection to a wider range of possibilities. That said, it needs to be emphasized that the Pope's Creek is a captive branch line. The only way to and from the Pope's Creek Branch is via the Northeast Corridor. As a result, even if the revenue operation were restricted to the branch, the Corridor compatibility is still a factor in getting equipment there in the first place and cycling the equipment off the branch for maintenance.

From a pure passenger service point of view, the scenario is less attractive. First, there's the idea of changing trains and walking between Pope's Creek and Penn Line platforms. Second, there's the time involved. The Southern Maryland train would typically arrive at Bowie 10 minutes before the Penn Lin train to Washington. Adding 10 minutes and a walk makes the train slower than a bus that offers a one-seat ride. Adding another Bowie station (1.1 miles south of the existing Bowie State station) lengthens the transit time to Washington for all the Penn Line riders involved.

The overarching consideration, at least in the short term, is the availability of seats. The Penn Line trains that would receive Southern Maryland passengers in the morning and discharge them at Bowie in the evening are already full to the point of standees. Any scheme anywhere on MARC that involves increased route structure or frequencies must include provisions for increased capacity. A transfer to and from existing Penn Line trains does not do this.

Therefore, the analysis and discussion in this study reflects trains running direct between Washington and Southern Maryland.

Segment 2: The Pope's Creek Subdivision

The Pope's Creek Subdivision runs from Bowie to La Plata and beyond. The mileposts are measured from Bowie with the indicator QP. From Bowie MP QP 0.0 to Pope MP QP 45.6, the line is owned and operated by CSX. Key points along the line are:

- Upper Marlboro, MP QP 13.8
- Junction with Herbert Sub (to Chalk Point) MP QP 24.6
- La Plata, MP QP 38.7

This is the Baltimore & Potomac (B&P) right-of-way as that railroad was originally chartered. The B&P was always under Pennsylvania Railroad (PRR) control and was assimilated into the PRR system around the turn of the nineteenth century. As the corporate identities changed through the last 50 years, the line became part of the Penn Central, Conrail, and, with the breakup of Conrail, CSX assumed ownership of this line and continues to own and operate it to this day.

Two to four trains operate per day between the Pepco plant at Morgantown on the Potomac and Benning Yard in South East Washington, DC. Under normal practice is a CSX train and engine crew comes on duty at Benning Yard in Washington, D.C. and takes a loaded coal train from Washington to Morgantown, bringing a train of empty cars back to Benning Yard.

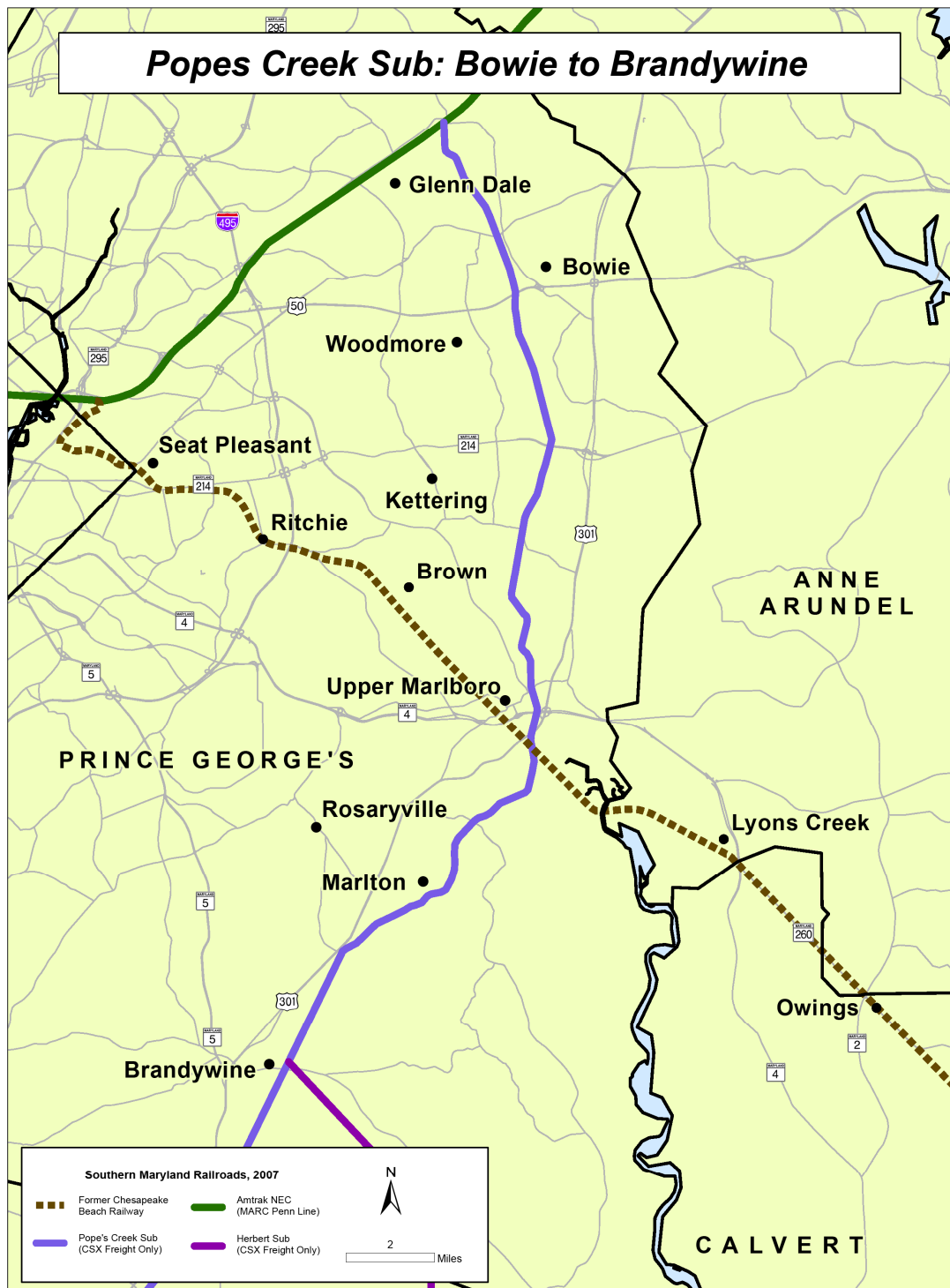
The Pope's Creek Subdivision is single track railroad with a 5,200 foot passing siding at Collington near Bowie and a similar siding at Brandywine north of Waldorf. There are no signals on the line. Operations are carried out under DCS Rules, which means the train dispatcher manually controls the line by granting the train 'permits' to occupy certain "blocks" or territories. The Pope's Creek Branch comes under the supervision of the "NI Train Dispatcher" located in the Albany Dispatching Office, Selkirk, NY. New federal safety law requires that the line be equipped with positive train control technology that is compatible with Amtrak's Northeast Corridor for passenger operation.

The line falls in the category of FRA Class III. The maximum speed for freight or passenger trains is 30 mph. There are 40 grade crossings on the Pope's Creek Subdivision between Bowie and La Plata. Of the many grade crossings, the most troublesome is the level crossing of US 301 south of Upper Marlboro near the Prince George's Equestrian Center⁴. The potential operation of faster and more frequent trains on the line, coupled with the relatively fast and heavy volume of vehicular traffic on US 301, make improvements to this grade crossing mandatory and warranted for reasons of safety. At a minimum, the grade crossing would be equipped with additional crossing protection devices. A more expensive, and perhaps more appropriate, solution would be to grade separate this crossing by realigning the roadway to pass either over or under the railroad.

The Pope's Creek Subdivision is split into two segments: northern and southern. The Northern Segment (2A) is Bowie to Brandywine, a distance of 24.6 miles. This segment would be used by trains that either would serve Hughesville Junction (Jct) and possibly St. Mary's County via the Herbert Subdivision, or continue down the Pope's Creek Subdivision to La Plata.

The Southern Segment (2B) for the Pope's Creek Subdivision is Brandywine to La Plata, 14.1 miles which would be used by trains for La Plata, either in lieu of or in addition to trains destined for Hughesville Jct and possibly St. Mary's County.

Figure 5: Bowie-Brandywine-La Plata—CSX Pope's Creek Northern Subdivision



2A. The Northern Segment

This entire line would need to be upgraded for passenger service with higher speeds and the introduction of a signal system. The projects that must be completed on the northern segment of the CSX Pope's Creek Subdivision, between Bowie and Brandywine (MP QP 0.0 to MP QP 24.6), are:

- Upgrade the track to 79 mph.
- Add a second 79 mph track for portions of the distance (approximately 15 miles in two segments), to support mixed passenger and freight service
- Install signals and automatic train control that is compatible with the Northeast Corridor.
- Build stations and parking facilities. Suggested stations are at Bowie Town Center, Upper Marlboro, and Brandywine.
- Eliminate or upgrade the US 301 Grade Crossing south of Upper Marlboro and upgrade or eliminate others.

Table 6 shows the summary capital costs for mandatory minimum level of improvements along the Pope's Creek Northern segment.

Table 6 - - Summary of Capital Costs - Low End of Range (Mandatory) - Pope's Creek Northern Segment (Bowie to Brandywine)

Improvement	Estimated Capital Cost (2009 Dollars)
Additional track, Sidings, and Signals	\$90,000,000
Stations and Parking	\$15,000,000
Grade Crossing Elimination (incl US 301)	\$35,000,000
ROW/ Land	\$15,000,000
Sitework Special Conditions	\$15,000,000
Total	\$170,000,000

Depending upon the total amount of commuter rail service to be operated and the level of ridership that the line is able to achieve, additional capital projects may be necessary to accommodate an increased level of train and passenger traffic. These additional projects at the high end of the cost range, and which most likely would not be required for the initial start-up phase of service, would include:

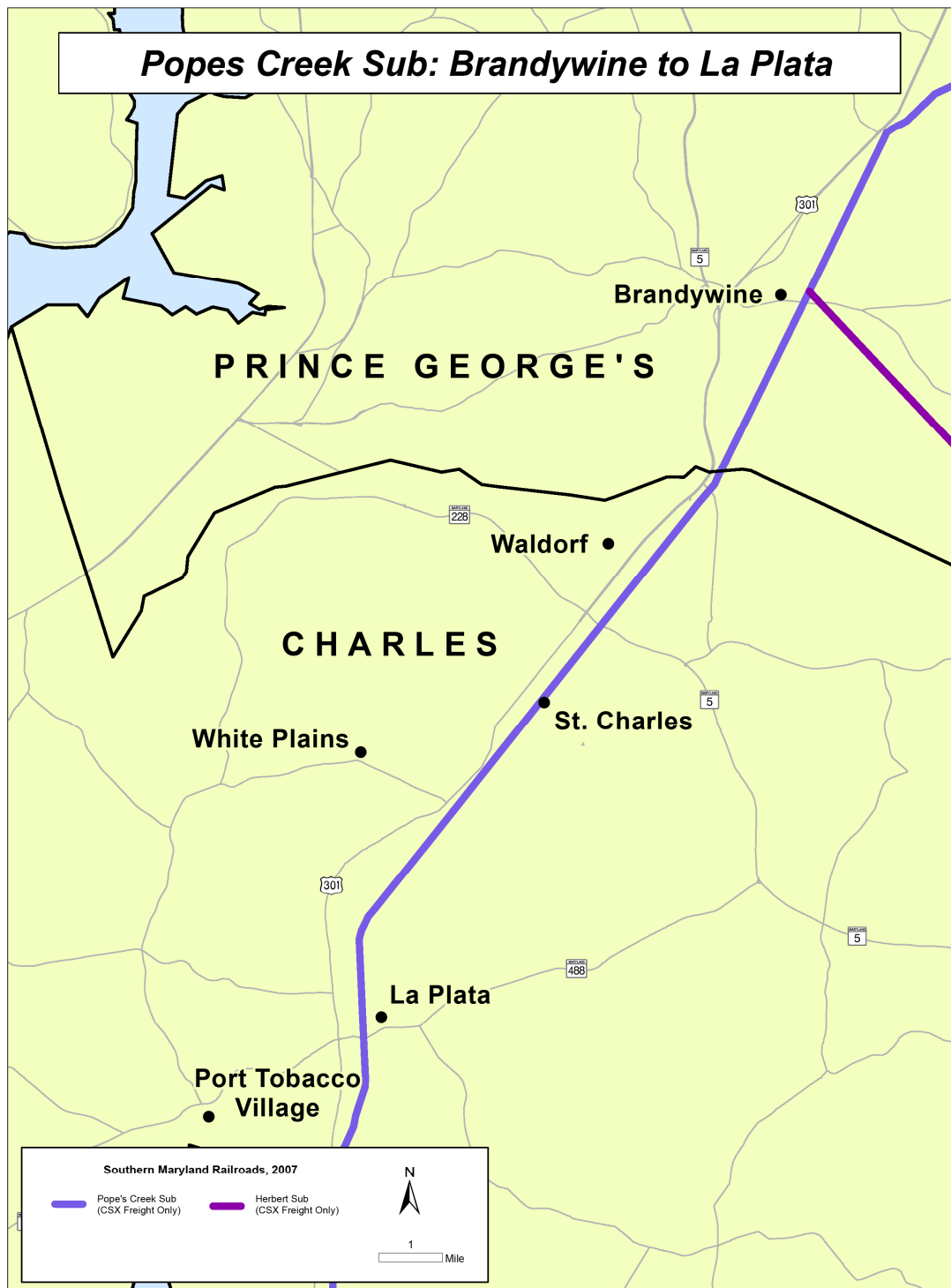
- Completing the double-tracking
- Additional station parking
- Additional grade crossing elimination.

Table 7 shows the summary capital costs for these potentially longer term improvements along the Pope's Creek Northern segment.

**Table 7 - Summary of Capital Costs - High End of Range - Pope's Creek Northern Segment
(Bowie to Brandywine)**

Improvement	Estimated Capital Costs (2009 Dollars)
Projects included in low end of the cost range	\$170,000,000
1. Complete the double tracking with signals	\$80,000,000
2. Additional Station Parking	\$15,000,000
3. Additional grade crossing elimination	\$20,000,000
4. Sitework and Special Conditions	\$15,000,000
Total Additional projects	\$130,000,000
Total – high end of cost range	\$300,000,000

Figure 6: Bowie-Brandywine-La Plata—CSX Pope's Creek Southern Subdivision



2B. The Southern Segment

For any Southern Maryland commuter rail service scenario that includes service to Waldorf and La Plata, the southern portion of the Pope's Creek Subdivision between Brandywine and La Plata (MP QP 24.6 to MP QP 38.7) would need to be upgraded for passenger service with higher speeds and signals. The minimum set of projects that would need to be completed are:

- Upgrade the track to 79 mph.
- Add a second 79 mph track for portions of the distance (approximately seven miles in two segments)
- Install signals and automatic train control that is compatible with the Northeast Corridor.
- Build stations and parking facilities. Suggested stations are Waldorf and La Plata.
- Upgrade or eliminate grade crossings

Table 8 shows the summary capital costs for these mandatory improvements along the Pope's Creek Southern segment.

Table 8 - Summary of Capital Costs - Low End of Range (Mandatory) - Pope's Creek Southern Segment (Brandywine to La Plata)

Improvement	Estimated Capital Cost (2009 Dollars)
Additional track, Sidings, and Signals	\$80,000,000
Stations and Parking	\$15,000,000
Grade Crossing Elimination (incl US 301)	\$10,000,000
ROW/ Land	\$10,000,000
Sitework Special Conditions	\$10,000,000
Total	\$125,000,000

As noted previously, additional capital projects may prove to be necessary at some point in time to accommodate a higher level of train and passenger traffic. These additional projects at the high end of the cost range, and which most likely would not be required for the initial start-up phase of service, would include:

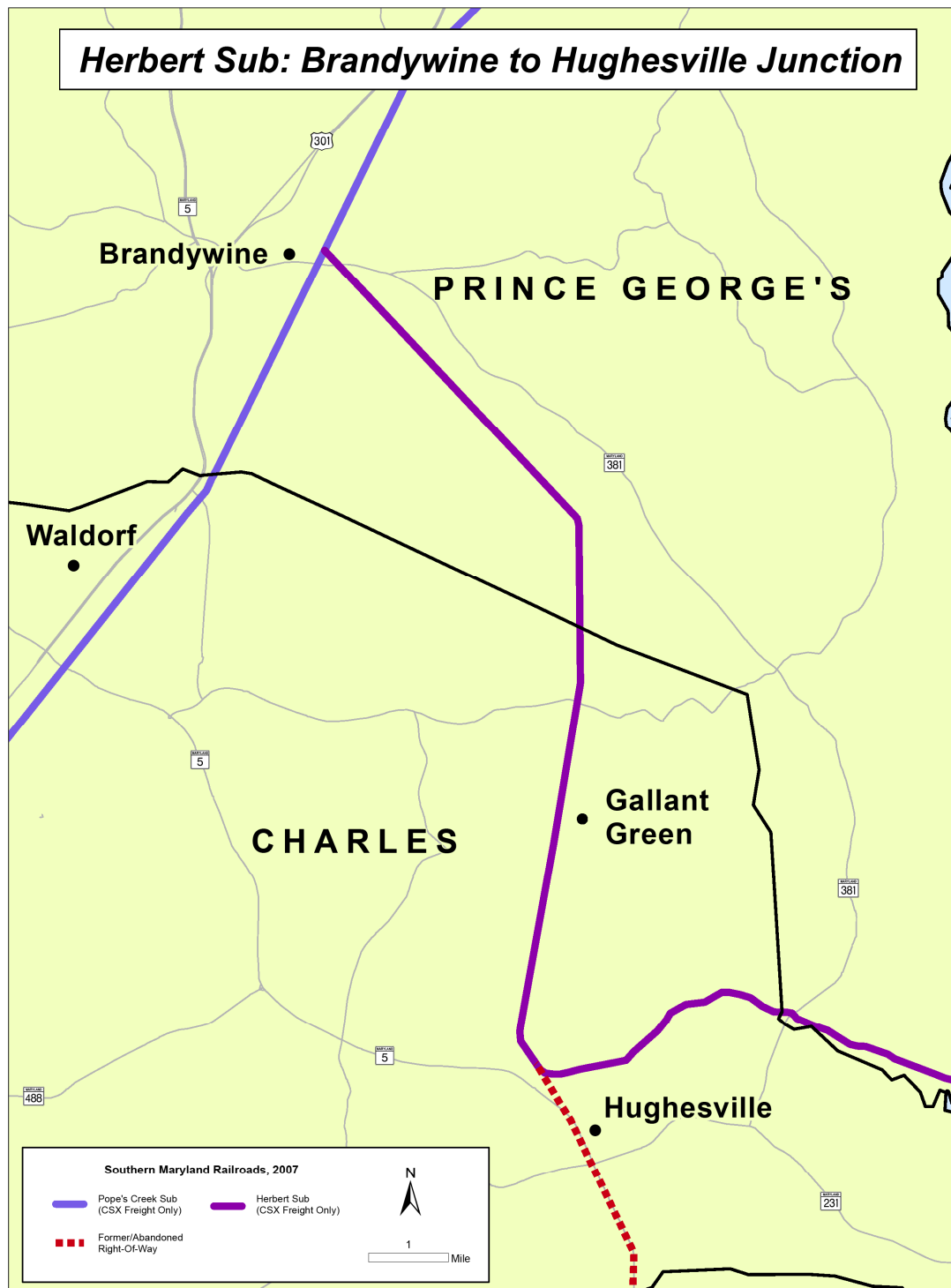
- Completing the double-tracking
- Additional station parking
- Additional grade crossing elimination.

Table 9 shows the summary capital costs for mandatory improvements along Pope's Creek Southern segment.

**Table 9 - Summary of Capital Costs - High End of Range - Pope's Creek Southern Segment
(Brandywine to La Plata)**

Improvement	Estimated Capital Costs (2009 Dollars)
Projects included in low end of the cost range	\$125,000,000
1. Complete the double tracking with signals	\$35,000,000
2. Additional Station Parking	\$10,000,000
3. Additional grade crossing elimination	\$10,000,000
4. Sitework and Special Conditions	\$10,000,000
Total Additional projects	\$65,000,000
Total – high end of cost range	\$190,000,000

Figure 7: Brandywine–Herbert--Chalk Point–CSX Herbert Subdivision



Segment 3: The Herbert Subdivision

This line has operated under several names over the course of its lifetime. The first trains went from Brandywine to Charlotte Hall and Mechanicsville in 1881. The railroad did not extend south of Mechanicsville until the US Navy built the line into the naval base during World War II.

The miles are measured from Brandywine, called “Dan” on the railroad, at MP QJ 0.0 to Chalk Point MP QJ 17.3 the same rules (DTC) and speeds (30 mph) and class of track (FRA Class III) prevail as on the Pope’s Creek Subdivision. Approximately two coal trains per week and two trains of returning empty cars operate on the line. The method of operation and crew cycles are as described above for the Pope’s Creek Sub.

The old junction for the abandoned line to St. Mary’s County is near Hughesville Pond, in Charles County near the intersection of Gallant Green Road and MD Route 5. On the railroad, the junction is called “Herbert” and is located at MP QJ 11.4.

The following improvements would need to be made before regular commuter service could begin on the Herbert Sub;

- Upgrade the track to 79 mph.
- Lengthen the Long Siding so that it is three miles long and interlocked.
- Install signals and automatic train control that is compatible with the Northeast Corridor.
- Build stations and parking facilities. Suggested stations are at Gallant Green and Hughesville Jct.
- Grade Crossing Improvements and eliminations.

Table 10 shows the summary capital costs for mandatory improvements along the Herbert Subdivision segment.

Table 10 - Summary of Capital Costs - Low End of Range (Mandatory) - Herbert Subdivision - Brandywine to Hughesville Jct.

Improvement	Estimated Capital Cost (2009 Dollars)
Additional track, Sidings, and Signals	\$55,000,000
Stations and Parking	\$10,000,000
Grade Crossing Elimination	\$10,000,000
ROW/ Land	\$ 5,000,000
Sitework Special Conditions	\$10,000,000
Total	\$90,000,000

Additional improvements might need to be made to support a higher level of commuter rail service and ridership, perhaps as later-phase investments over a period of time:

- Additional double track, with associated signals and positive train control
- Additional station parking facilities
- Additional grade crossing upgrades and elimination.

Table 11 shows the summary capital costs for longer term improvements along the Herbert Subdivision segment.

Table 11 - Summary of Capital Costs - High End of Range - Herbert Subdivision - Brandywine to Hughesville Jct.

Improvement	Estimated Capital Costs (2009 Dollars)
Projects included in low end of the cost range	\$90,000,000
1. Additional double tracking with signals	\$25,000,000
2. Additional Station Parking	\$ 5,000,000
3. Additional grade crossing elimination	\$10,000,000
4. Sitework and Special Conditions	\$10,000,000
Total Additional projects	\$50,000,000
Total – high end of cost range	\$140,000,000

Figure 8: Herbert (Hughesville Jct) – Lexington Park – St. Mary's County Abandoned Right-of-Way



Segment 4: The Lexington Park Subdivision

The railroad right-of-way has basically disappeared. Some of it is part of Three Notch Trail in Charlotte Hall, a project of the St. Mary's County Rails to Trails Project. More phases are planned to take the trail all the way to Lexington Park.

At its best, the single track right-of-way has many curves. It was designed for low-speed freight transfer service. Passengers, what few there were, were carried as an "accommodation." Putting it back would require both widening the right-of-way, at least in part, for double track and straightening out the curves to allow for speeds of at least 30 mph.

If rail service were to come to St. Mary's County, a new alignment ought to be considered to reduce the number of grade crossings and increase operating speed.

Before service could begin on the final 27 miles, a new railroad needs to be built. This involves the following projects as a minimum:

- Design and construction of new railroad right-of-way, single track with sidings.
- Equip the line with signals and positive train control that would allow for a 79 mph operation
- Build stations and parking facilities. Potential stations are at Hughesville, Charlotte Hall, Orville, California, and Lexington Park
- Special sitework and construction to make the new line free of grade crossings.

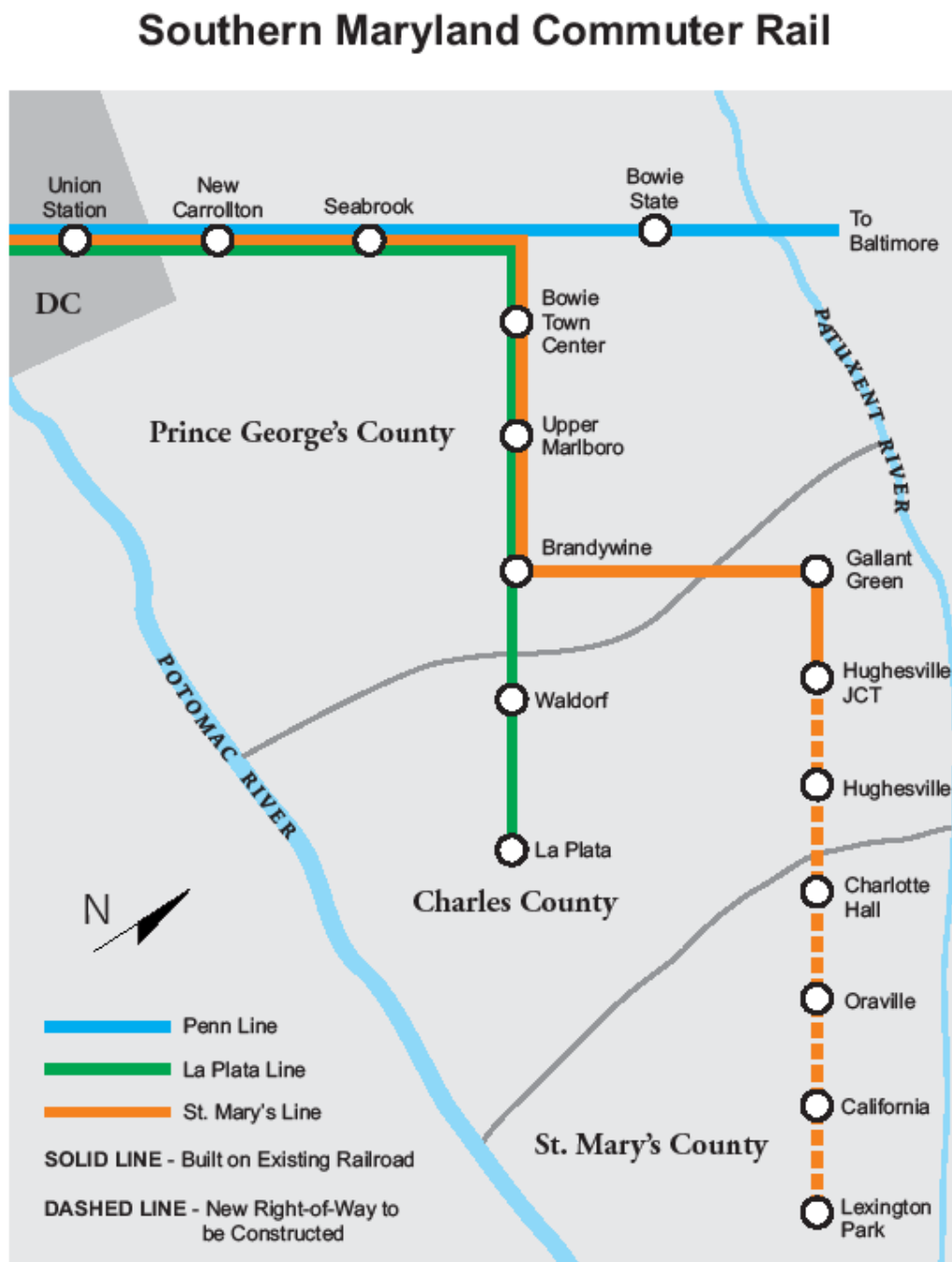
Table 12 shows the summary capital costs for mandatory improvements along the Herbert Subdivision segment.

Table 12 - Summary of Capital Costs - Hughesville Jct to Lexington Park--Mandatory

Improvement	Estimated Capital Cost (2009 Dollars)
Additional track, Sidings, and Signals	\$280,000,000
Stations and Parking	\$ 40,000,000
Grade Crossing Elimination	\$100,000,000
ROW/ Land	\$ 60,000,000
Site work Special Conditions	\$100,000,000
Total	\$580,000,000

Figure 9 shows what a complete Southern Maryland commuter rail map could potentially look like with full commuter rail service on both Southern Maryland branch lines:

Figure 9: Potential Southern Maryland Commuter Rail Map



System Operations

Table 13 summarizes the average number of existing weekday train movements on the active segments listed above.

Table 13 - Average Weekday Train Movements

Line Segment	Amtrak	MARC	Freight
Bowie-Washington Union Station	84	50	4
Bowie-Brandywine Pope's Creek Sub	0	0	3
Brandywine-La Plata Pope's Creek Sub	0	0	2
Brandywine-Hughesville Jct (Herbert Sub)	0	0	1

A startup service plan could be drawn up for Southern Maryland commuter rail that provides three trains to Washington in the weekday morning peak, and three trains returning back to Southern Maryland during the evening peak period. This level of service would be similar to the starter service that was put in place by MTA on the MARC Frederick Branch in the mid 1990s. Depending on the extent of ridership demand, this basic level of service could be an end state condition, or it could be the starting point for a service that continues to grow as ridership demand builds. It is more likely that demand for Southern Maryland commuter rail service will support a single line rather than simultaneous operations on both branch lines (to La Plata and to Hughesville Jct.), in which case an alternatives analysis would be needed to select the most appropriate corridor for initial implementation.

The challenge of the current infrastructure from the perspective of market penetration is that the 30 mile per hour speeds are just too slow to allow the railroad to compete with existing bus service. **Table 14** is an example of what morning peak period inbound schedules might look like from La Plata with current speeds.

Table 14 – Sample Inbound Peak Period Train Schedule

Station	Train 701	Train 703	Train 705	Bus 901
La Plata	6:00AM	6:30AM	7:00AM	6:00AM
Waldorf	6:17AM	6:47AM	7:17AM	6:26AM
Brandywine	6:32AM	7:02AM	7:32AM	
Upper Marlboro	6:56AM	7:26AM	7:56AM	
Bowie Town Center	7:14 AM	7:44AM	8:14AM	
New Carrollton	7:29 AM	7:59AM	8:29AM	
Washington, DC (Union Station)	7:50AM	8:20AM	8:50AM	
Washington, DC (Metro Center)	8:02 AM	8:32AM	9:02AM	7:28 AM
Total Time	122 minutes	122 minutes	122 minutes	88 mins

Improving the running time requires considerable capital investment for speed and safety. The two principal components of the capital investment for running time are the reconfiguration of the interlocking at Bowie and upgrading the track on the Pope's Creek so that trains can operate faster. Right behind these two major investments are the elimination of the US Route 301 crossing at grade and the installation of double track, for at least a portion of the line to accommodate the CSX coal trains. An operating plan that would effectively compete with current commuter bus

service anticipates a maximum authorized speed of 79 mph. Achieving those speeds would require train control systems beyond the manual system used now. The frequent station stops and existing grades would result in an average speed of approximately 40-50 mph. As the project develops, the use of a train performance calculator as part of a train simulation software package will be warranted to define the train schedules and running times more precisely.

Signals are a safety consideration as well as speed. The signals and automatic train control that would need to be installed must be compatible with the Amtrak Northeast Corridor (NEC) and built to NEC standards. Both the CSX and MARC trains that would likely use the Pope's Creek are already compatible with the NEC since the Pope's Creek Subdivision can only be accessed via the Northeast Corridor.

Table 15 shows how an improved, signaled Pope's Creek Subdivision would result in improved trip times to downtown Washington, DC, which would be competitive with those achieved by the existing commuter bus service.

Table 15 – Commuter Headway Comparison: Pope's Creek Train vs. MTA Commuter Bus 901

Station	Train 701	Bus 901
La Plata	6:00AM	6:00AM
Waldorf	6:09AM	6:26AM
Brandywine	6:17AM	
Upper Marlboro	6:28 AM	
Bowie Town Center	6:38AM	
New Carrollton	6:48AM	
Washington, DC (Union Station)	7:03AM	
Washington, DC (Metro Center)	7:15AM*	7:28AM
Total Time	75 mins	88 mins

* via transfer to the Metrorail Red Line

TRAIN EQUIPMENT AND FACILITIES

Vehicles

Equipment is a key issue for starting and sustaining commuter rail service. The Northeast Corridor is an electrified railroad. The Pope's Creek Subdivision is not. The options available to address this incompatibility are either to electrify the Pope's Creek railway or to utilize diesel hauled trains. It is assumed that electrification would be cost-prohibitive, given the length of right-of-way under discussion.

The Northeast Corridor uses high level platforms. Some MARC equipment, the ex-Chicago Gallery Cars are incompatible with a high level platform operation, thus constricting the available equipment pool that might be used for such a service. The presumption for the Pope's Creek Subdivision is that fully ADA-compliant high level platforms would be constructed.

The most likely equipment for this service is diesel-hauled push-pull equipment similar to the rest of the MARC fleet. The "push-pull" concept means that the train can be controlled or operated

from either the locomotive on one end or a “control car”, fitted with control stand, on the other end. This is the standard method of diesel hauled commuter service throughout North America, although there are several different manufacturers and coach configurations. Planning for this service should be oriented to more of MARC’s current or planned car fleet for maintenance considerations. MARC does not have any surplus diesel locomotives or rail cars that could be utilized for Southern Maryland service. Therefore, rail equipment would either need to be purchased new or acquired from other commuter rail properties, and the capital costs for the project would need to include equipment acquisition.

Diesel Multiple Units (DMU) theoretically would be another potential type of commuter equipment that might be considered for Southern Maryland service, but, at present, there are no American manufacturers of FRA-compliant DMU vehicles, so such equipment is not currently available. When the time comes to make equipment decisions for this line, if new compliant DMU’s are potentially available, their use should be considered. However, until such time that a new manufacturer enters the market, DMU’s are not a viable option.

Train Storage Yards

Determining requirements for storage of the rail equipment is a two-part question. The equipment needs a place to park twice a day. There is midday storage and overnight storage. There are multiple ways in which equipment storage needs could be met, and a more detailed analysis would be required to select the most cost-effective overall approach.

There are two options for providing mid-day storage for the train sets:

- Store the equipment midday at the destination point of the morning runs. In this case, that means storage in Washington, DC.
- Take the equipment somewhere else to store in between the morning and afternoon commute service.

Ideally, storage in Washington has the advantage of making the equipment available to the equipment maintenance forces that already are on duty to clean, inspect and repair MARC equipment during the short midday layover, six hours or less. The problem is the finite storage space in and around Washington Union Station that can accommodate Amtrak, MARC, and Virginia Railway Express trains. Additional capital investment might be needed to augment MARC’s mid-day storage capacity in or around Washington Union Station. If space in Washington cannot be provided cost-effectively, other more remote options for creating mid-day storage space potentially include the Landover area, the Amtrak Odenton Maintenance of Way Base, and the Bowie Racetrack spur.

As with midday storage, there are two options for storing the train sets during the overnight period:

- Store the equipment at the outlying points (e.g., near La Plata or Hughesville Jct.)
- Operate the equipment to a remote storage yard somewhere else for overnight storage, following its last evening peak run, and returning to Southern Maryland in advance of the next day's morning peak period.

Ideally, the equipment should be stored overnight at or near the place where it will enter service the following morning – to minimize the extra mileage and wear and tear on the rail equipment, and to maximize the time available for maintenance crews to work on the equipment during the overnight period. Usually, for start-up commuter rail operations, the overnight storage yard would be a bare bones sort of facility, suitable for inspections and servicing, but not for heavier maintenance activities. Ironically, the overnight layover period is generally two to four hours longer than the available midday layover, making outlying locations relatively attractive places for performing basic servicing of the equipment, and offering more opportunity to the equipment maintenance (mechanical) forces for running repairs and program maintenance.

Noise can be a serious issue for an overnight storage facility that is not in an industrial area. Diesels engines, daily horn tests, and yard switching movements to position trains for maintenance activities all make noise and could be objectionable to local communities.

Care needs to be taken in selecting the location of yard storage and basic maintenance facilities, but, other considerations being equal, a facility near the endpoint of service is preferable to one that requires long non-revenue-generating (or “deadhead”) train movements to and from a remotely-located storage facility. Deadhead miles generally are costly. They run up the train mile costs the line owner assesses. They run up the crew costs because crews are paid by time on duty. They add to the fair wear and tear of the equipment and rack up delays caused by equipment out of position. Some deadheading may be necessary to reposition equipment for a number of good reasons, but the practice should be minimized in an operating plan if circumstances allow.

Train Equipment Maintenance Facilities

The maintenance axiom is essentially the fewer equipment types in the service the better. The fewer types of equipment that must be maintained, the simpler the training, the more efficient the materials management and spare parts inventory, and thus the easier to maintain. This argues for the adoption of a push-pull type of commuter fleet similar or identical to the newer (or new) equipment in the MARC fleet. To illustrate this principle by an example from another mode of transportation, Southwest Airlines uses just one type of aircraft for all its service. This simplifies both operations and maintenance. The relevance to maintenance in this context is that when it comes to equipment selection, it is generally better to buy what MARC already has or is buying as replacements.

The number of train sets used in Southern Maryland service will most likely never reach the level where the construction of a major MARC maintenance facility is warranted. The potential Southern Maryland service is similar to the MARC Frederick service in that a small facility was constructed for daily servicing and light repairs. Periodically, the Southern Maryland train sets would need to be sent to the major MARC maintenance shop for annual inspections, significant repairs and overhauls. For this reason, the equipment's compatibility with the rest of the MARC fleet is important because the equipment in Southern Maryland service can be replaced when necessary with other equipment without affecting the service.

The daily Service and Inspection (S&I) would be performed at the overnight storage location. Additional maintenance activities could be undertaken at the mid-day storage location.

Periodically, the train sets would need to be sent to the major MARC maintenance shop for annual inspections, significant repairs and overhauls. For this reason, compatibility with the rest of the MARC fleet is important, so the So MD fleet can be replaced when necessary with other compatible equipment without affecting the service.

STATIONS AND PARKING

The stations that appear to be good candidates for commuter service on the Pope's Creek Branch are as follows (and are shown on **Figure 9**):

Bowie Town Center - This describes a future station to be located on the Pope's Creek Branch that is accessible to US Route 50 (John Hanson Highway) and Collington Road. The service that comes to the Northeast Corridor at Bowie will not be routed by Bowie State because the junction with the Northeast Corridor is approximately one mile south of the Bowie State station. Therefore, a new station needs to be found to serve patrons in the Bowie area. Bowie will therefore have a station on the Penn Line (Bowie State) and a station on the Branch (Bowie Town Center).

Upper Marlboro - A station that's convenient to parking, Route 301 and Route 4 from Southern Maryland) that will not create traffic jams in the town center.

La Plata - Accessible from St. Mary's County via Route 6. It may, but need not be, the historic former station.

If service were extended down the Herbert Subdivision to North Hughesville, the following additional stations would be activated.

Brandywine - This is the junction of the line to Morgantown (Pope's Creek Subdivision) and the line to Chalk Point (Herbert Sub). On the Pope's Creek Branch it is situated between Upper Marlboro and La Plata

Gallant Green - This describes a future station in Charles County near the intersection of Woodville Road and Gallant Green Road. The current rural location could support a park and ride and, with Waldorf, become the railroad equivalent of the Mattawoman-Beantown Park and Ride.

Hughesville Junction - the nearest point to St. Mary's County and a suitable location of a Park and Ride.

If the commuter service were extended farther down the Pope's Creek Subdivision from Brandywine to La Plata, then the additional stations would be:

Waldorf - This station would provide additional travel mobility to patrons who currently use the bus stops at South Potomac Church, US 301 Park and Ride, and St. Charles Town Center Mall.

La Plata - This does not necessarily mean the historic La Plata Station, but a rail station that is the equivalent in function, if not location, to the La Plata Park and Ride.

In all cases, the station sites are conceptual. Later work, with the full, active participation of the counties and municipalities involved would select the station site and park and ride lots.

The stations are planned to have a fully ADA compliant high level platform, with canopy and shelter.

THE EFFECT ON CSX

Operating passenger trains on the Pope's Creek Subdivision would change the nature of the Pope's Creek Subdivision for its owner, CSX. At the present time, CSX maintains the subdivision sufficient to its needs for coal and local freight trains. CSX does not require higher train speeds and the introduction of signals and train control in order to serve their freight customers, in this case two large power plants. Yet, because CSX owns the line, CSX would be responsible for carrying out the construction, signaling, training, and operation of rail passenger service on the line. CSX could take a view that none of this serves a useful purpose for CSX, and none of this would have a priority for CSX. All capital and operating costs over and above those required by CSX to run its freight trains would be expected to be paid for by the State using public funds. The outlook for a public private partnership with CSX is not very favorable in this case because there would be no significant private gain.

Considering that the State of Maryland does business with CSX on a wide range of mutually beneficial projects, there might be an opportunity to bundle the Pope's Creek project with other freight rail clearance and access projects.

There are two approaches to line ownership with respect to the Pope's Creek and Herbert Subdivisions:

- CSX retains ownership and requires large capital investment for operating passenger and freight trains and ongoing access fees for passenger operations that use the line.
- CSX sells the line to the State through a state agency but retains the right to use the railroad in perpetuity. With this approach, the State would have more control over the capital costs. CSX's selling price might be high, but there is a precedent and mechanism in place in New York to value the Hudson Line with a view to selling it to the State of New York.

The second approach is consistent with CSX's position on the MARC Frederick Branch. The Pope's Creek line, however, would be several times the size of the Frederick Branch project and also more complex.

Table 16 shows the range of funding that might be required to construct commuter rail service in Southern Maryland, depending on the expected level of ridership demand and the outcome of negotiations with Amtrak and CSX to obtain permission to operate additional Southern Maryland commuter trains.

Table 16 – Capital Funding Needed for Improvements, by Line Segment

Line Segment	Low End of Range (Mandatory)	High End of Range (Possible Longer Term)
Northeast Corridor	\$ 25,000,000	\$135,000,000
Bowie-Brandywine	\$170,000,000	\$300,000,000
Brandywine-La Plata	\$125,000,000	\$190,000,000
Brandywine-Hughesville Jct	\$ 90,000,000	\$140,000,000
Hughesville Jct-to Lexington Park	\$580,000,000	\$580,000,000
Equipment Procurement	\$ 40,000,000	\$ 70,000,000
Equipment Maintenance Facility		\$ 25,000,000
Total	\$1,030,000,000	\$1,440,000,000

- Major investment is needed in order to make commuter rail time competitive with the express bus services in Southern Maryland. Despite common perceptions, the commuter rail option is not "cheap." However, on a cost-per-mile basis, upgrading existing rail lines to accommodate commuter trains can be more effective than investing in new light or heavy rail transit lines.
- Once the decision is made to commit the resources to passenger service *either* to La Plata or to Hughesville Jct., the incremental cost of serving the other appears much more reasonable, taking advantage of economies of scale along the common-use portions of the line. Nevertheless, higher levels of commuter rail service are more likely to trigger the need for additional track capacity on the Northeast Corridor or the

- grade-separated rail tunnel connection at Bowie – to mitigate potential impacts to Southern Maryland service on Amtrak and MARC Penn Line operations.
- Building new railroad to St. Mary's county would be significantly more expensive than upgrading the existing railroad to either La Plata or Hughesville Jct.

In addition to the costs for track and signals, there is the question of a maintenance facility in Southern Maryland. The estimated cost for a “generic” functional overnight layover facility with an indoor shop is approximately \$25,000,000, regardless of location. Land costs would be extra.

Procurement of new equipment (locomotives and coaches) would represent another capital expense of approximately \$60,000,000 to \$80,000,000.

Consistent with the MARC Growth and Investment Plan, the operating costs would range from approximately \$5,000,000 to \$8,000,000 depending on the number of trains.

Endnotes

¹ Even Amtrak is organized and functions as a private corporation, incorporated under the laws of the District of Columbia. It is “public” in the sense that its stock is held by the Treasurer of the United States and voted by the Secretary of Transportation.

² Push Pull trains operate with the locomotive pulling the train in one direction and pushing it in the other direction to allow the maximum flexibility in changing directions. In the push mode, the engineer controls the train from a control compartment at the non-locomotive end.

³ The Federal Railroad Administration has codified track into classes for determining maximum speed consistent with safety. The class, and therefore speed, is determined by geometric measurements of gage and cross level, tie condition and securement. In describing FRA Class, Class I is the lowest, Class VI (and above) the highest.

⁴ On the railroad, the level crossing of the Pope’s Creek Subdivision and the dual lane US Route 301 is at MP QP 14.8 (DOT #529576U. The crossing is currently protected by gates and flashing lights. See Also Appendix B.

Appendices

Appendix A: Summary History and Description of Southern Maryland Rail Lines

The following is a high-level summary of the relevant rail lines in Southern Maryland in the development of commuter rail service from St. Mary's County and Southern Maryland to Washington, DC. The lines join the MARC Penn Line (Amtrak Main Line) at Bowie, Maryland and operate over that line to Union Station, Washington, DC.

Bowie—Brandywine

History: Baltimore & Potomac RR, Pennsylvania RR, Penn Central Transportation Co, Conrail, CSX. Last regular passenger service on this branch was in 1949.

Current Status: Active, Pope's Creek Sub, freight only, owned /operated by CSX.

Characteristics: Single Track, no signals, and 30 mph. maximum speed. The line continues through Charles County, adjacent to Route 301 through La Plata to Newburg/ Morgantown.

Brandywine -- Hughesville

History: Washington City and Point Lookout Railroad, Washington & Potomac Railroad, Washington, Brandywine & Point Lookout Railroad, US Government Railroad, Pennsylvania Railroad, Penn Central Transportation Co, Conrail, CSX.

Current Status: Active, Herbert Subdivision, freight only, owned /operated by CSX

Characteristics: Single track, no signals, 30 mph maximum speed. The line continues past Hughesville to Chalk Point in Prince George's County.

Hughesville to Lexington Park

History: See Brandywine to Hughesville, above. When train operations ceased in the early 1960's, GSA offered the line for sale. The St Mary's County Commissioners purchased 28 miles of abandoned right-of-way on June 26, 1970. The rails were removed in the mid 70's.

Current Status: Abandoned, right-of-way nearly obliterated. There are few remnants of the original line to identify it as a rail line, except for the occasional milepost. Part of the line has been converted for use as the Three Notch Trail. Because of development adjacent to Route 235, the former right-of-way may not be suitable for restoration as a commuter rail line.

Appendix B: Grade Crossings on CSX Pope's Creek Subdivision to La Plata

(Mile Posts begin at Bowie. Timetable direction from Bowie to Pope is south.)

MP	Grade Crossing	DOT Number	Protection
0.2	Front Station Road	529612M	Crossbucks
0.5	Zug Road	529613U	Crossbucks
1.1	Highbridge Road	529614B	Flashing Lights
1.7	Old Chapel Road	529615H	Flashing Lights
6.3	Mount Oak Road	529585T	Gates
7.7	Hall Road	529570D	Flashing Lights
7.9	Central Avenue	529571K	Gates
10	Leland Road	529569J	Gates
11.2	Private	903821A	Stop Sign
13.3	Bucks	913047T	Crossbucks
13.5	Bucks Dist.	529573Y	Crossbucks
13.8	Marlboro Road	529574F	Gates
13.8	Upper Marlboro Station		
14.8	US Hwy 301	529576U	Gates
16.1	Chew Road	529578H	Crossbucks
17.4	Croom Station Road	529584L	Flashing Lights
17.5	Croom Road	529583E	Flashing Lights
20.2	Dudley Station Road	5295812R	Flashing Lights
21.1	Old Indian Head Road	532286W	Crossbucks
21.4	Old Indian Head Rd (again)	532287W	Crossbucks
22.1	Cheltenham Crossing	532288D	Crossbucks
22.4	Cherry Tree Cross Rd	532289K	Flashing Lights
22.8	Cherry Tree Cross Road (again)	532290E	Crossbucks
23.4	Old Indian Head Rd	532291L	Stop Sign
23.5	Old Indian Head Road (again)	532292T	Crossbucks
23.9	Private Road	532293A	Nothing
24.9	Brandywine Road	532294G	Flashing Lights
27.3	Cedarville Rd.	532295N	Flashing Lights
28.4	By Pass	918415X	Gates
28.5	Attawoman-Beantown Rd	532296V	Gates
28.7	Substation Road	532297C	Flashing Lights
29.9	Acton Lane	532298J	Stop Sign

MP	Grade Crossing	DOT Number	Protection
31.1	Waldorf Station		
31.9	Waldorf Rd	532250G	Gates
33.5	Billingsly Road	918416E	Gates
33.8	Demarr Rd	532253C	Flashing Lights
34.5	Willetts Crossing	532254J	Flashing Lights
35.1	Whitelady Road	532255R	Stop Sign
36.6	Industrial Crossing	918417L	Flashing Lights
36.7	Rosewick Rd	532256X	Flashing Lights
38.3	Kent Avenue La Plata	532258L	Flashing Lights
38.7	La Plata Station		
38.8	Charles Street, La Plata	532259T	Gates

Summary of Grade Crossing Protection By Type

Nothing	1	Flashing Lights	15
Crossbucks	10	Gates	10
Stop Sign	4	TOTAL	40

Appendix C: References Consulted

DATE	REFERENCE
1974	Relocation Study for a Railroad Right-of-Way in St. Mary's County, Maryland, Barton Aschman Associates, Inc, Washington, DC
1976	An Examination of the St. Mary's County Railroad Right-of-Way by George W. Colton, PhD, Dept of Recreation, Univ of Maryland
1990	Maryland Statewide Commuter Assistance Study: Corridor Profile Report, Corridor 14B, Southern Maryland/Washington, MD5/US301, by COMSIS Corp, Silver Spring in association with PBQD and Richard H. Pratt.
1996	Final Recommendations, US 301 South Corridor Transportation Study
1996	Final Report, Southern Maryland Mass Transportation Alternatives Study by COMSIS in association with PBQD and Basile Baumann Prost & Associates, Inc.
1998	Memorandum, Jonathan Wise, MTA to Harvey Fletcher, MTA, Light Rail Right-of-Way, Brandywine to Lexington Park
1998	Feasibility Study Report, FDR Boulevard, by SHA and St. Mary's County.
1998	Letter, Secretary Porcari to Sen. Miller and Delegate Taylor, Hughesville to Lexington Park Right-of-Way Preservation Study
2005	Railroad Corridor Transportation Plans: a Guidance Manual, Federal Railroad Administration
2006	Amtrak and CSX Operating Timetables, Special Instructions, and Track Charts pertaining to the CSX Pope's Creek Subdivision and Northeast Corridor Main Line.