

**Maryland Trails Strategic Implementation Plan**  
*State of the Trails Addendum*

final  
report

*prepared for*

**Maryland Department of Transportation**

*prepared by*

**Cambridge Systematics, Inc.**

*with*

Toole Design Group



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*final report*

# **Maryland Trails Strategic Implementation Plan**

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*prepared for*

Maryland Department of Transportation

*prepared by*

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# **About the Addendum**



# About the Addendum

This addendum to the Maryland Trails Strategic Implementation Plan (TSIP) was prepared for the Maryland Department of Transportation (MDOT) as a first step in systematically analyzing data on Maryland's Statewide transportation trails network. This addendum describes the physical extent of the transportation trail system in Maryland and identifies priority missing links in the statewide transportation trails network. It examines existing and planned trails as well as trail needs, both in terms of communities that are underserved and gaps in statewide connectivity. The analyses were conducted using data in the Geographic Information System (GIS) format and other data from local jurisdictions, state agencies, the public, and the MDOT consultant team.

This addendum provides MDOT a preliminary framework for prioritization of planned, proposed, and future trail projects. Attachment A presents a trail priority project list, which identifies specific trail links that would increase trail utility for transportation and economic development. From a methodological perspective, this analysis offers MDOT a foundation for identifying and evaluating trail needs and benefits. In addition, the compilation of existing trail information from around the State and the standardization of this data into GIS represents a new platform from which to conduct trail planning in Maryland.

- **Section 1.0: Defining a Statewide Transportation Trails Network and Critical Missing Links** - This section provides a description of the definitions used in assessing Maryland's transportation trails network.
- **Section 2.0: Connectivity Analysis** - This analysis of trails data identifies trail needs and evaluates connectivity gaps, or missing links, in the transportation trails network. This section also presents the evaluation methods employed, including a description of the prioritization criteria that was used.



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# **1.0 Defining a Statewide Transportation Trails Network and Critical Missing Links**



# 1.0 Defining a Statewide Transportation Trails Network and Critical Missing Links

This addendum describes the extent of Maryland’s transportation trails network and identifies priority missing links. This report describes the methodology and findings of the trail connectivity and service gap analyses. These analyses were conducted using GIS and other data from the following sources: local jurisdictions, state agencies, the public, and the consultant team. At the conclusion of this report, opportunities and recommendations are provided that will help guide trail development of the State and local jurisdictions over the upcoming 10 to 15 years.

## ■ Defining Transportation Trails

The first step in the analysis process was to distinguish transportation trails from all other trails. Because there has previously been no standard definition of what constitutes a “transportation trail,” a set of definitions was developed to clarify the type of trail that is needed for a statewide transportation system of trails. Within the scope of the Maryland TSIP, transportation trails share the following characteristics:

- They are shared use paths (sometimes called multi-use trails or hiker-biker trails) that are designed to be used by bicyclists and pedestrians, including runners and people with disabilities.
- They are paved or crushed stone shared use paths that can be used for transportation purposes. (However, it is understood that these trails and greenway corridors also serve recreational needs and possibly other purposes.)
- They already are, or will become, part of existing national or regional trail system such as the East Coast Greenway or Great Allegheny Passage.
- They include sidepaths, or shared use paths designed for bicycle and pedestrian use that are located on the side of a road or highway.

- They are not sidewalks, on-road bicycle facilities, or on-road bicycle routes.<sup>1</sup>
- They are not exclusive hiking, equestrian trails, and/or mountain biking trails. Neither are they nature trails, interpretive trails, natural surface trails, or loop trails located wholly within a park or natural area.

In summary, transportation trails are those that by virtue of the design, surface type, location, context, extent, and allowable uses provide bicycle and pedestrian transportation and/or serve as key components of a sustainable nonmotorized transportation system.

## Maryland’s Transportation Trails Network

Using this definition, a set of trails that constitute a statewide transportation trails network was identified. This network includes more than 817 miles of existing trails spread throughout 18 of Maryland’s 23 counties (and Baltimore City). Table 1.1 shows the counties that contain the most mileage of existing transportation trails.

**Table 1.1 Mileage of Existing Transportation Trails by Jurisdiction**

Mileage	Jurisdiction
225	Montgomery
143	Howard <sup>a</sup>
90	Prince George’s
76	Washington
68	Allegany
45	Baltimore City
45	Baltimore County

<sup>a</sup> Most transportation trails in Howard County are found in Columbia, Maryland.

Of the total trails mileage, over 85 percent is concentrated in the seven jurisdictions listed in Table 1.1. Montgomery County has the most extensive system of existing trails with 225 miles or 28 percent of the State’s total. Following Montgomery County, trails in Howard, Prince George’s, and Washington Counties make up an additional 309 miles, or 39 percent of the State’s total trail network. Allegany County has 8.5 percent of the total

<sup>1</sup> Some key on-road links are identified in this project’s dataset as important complements to Statewide and local transportation trail networks.

state trail network within their boundaries, and Baltimore City and Baltimore County have just over 11 percent of the total network within their bounds.

### *Trail Status*

Existing and unbuilt trails were inventoried as part of the TSIP effort. A status has been assigned to all trail segments in the statewide transportation trails network based on the maturity of the particular trail, or trail segment, in the planning and implementation process. Following are the status categories and definitions that are used in this document:

- **Existing** – Trail is built and open to the public (a few trails currently are under construction and expected to be open by the end of 2009).
- **Planned** – Local jurisdiction or other authority has identified the trail and included it in an adopted plan, or the trail is otherwise actively moving through a state, private development or local planning process.
- **Proposed** – Trail is not yet in the planning process, or it is in the very early stages. It may have been proposed by individual citizens, trail advocacy groups, government agencies or the MDOT consultant team. It is likely that the trail has had a modest level of right-of-way (ROW) investigation or assessment.
- **Potential** – Trail’s ROW has only a cursory or general level of identification and little or no investigation of other development factors, such as environmental issues, public support, engineering difficulty, etc.
- **Uninvestigated** – A trail connection has been identified in need only; the alignment and a usable right-of-way have **not** been identified. The need for trail connectivity has been identified based on an assessment of population distribution, potential demand and/or other planning level criteria. The length of the link is a gross approximation and the actual extent or connections to other trails are undetermined. Most of these uninvestigated trail connections are in or between communities that have few or no existing trails. These areas need further study and engagement of both the public and the governments within which they are located.

Approximately 1,930 miles of unconstructed trail have been identified in various stages of planning. These unbuilt trails can be further described as follows:

- 480 miles of planned and proposed trails; and
- 1,447 miles of potential trails and uninvestigated corridors of need that also have been identified.

These additional planned, proposed, and potential trails are spread throughout every jurisdiction in the State. Among the unconstructed trails described above, a total of 161 missing links have been identified through the TSIP planning and analysis process. These

missing links total approximately 771 miles of planned, proposed, and potential trails (see Section 2.0).

In addition to trails, which are all off-road facilities, 203 miles of key on-road links have been identified as connecting routes in locations where off-road trail connections are either not possible or currently missing. These connecting road segments are stored in a GIS dataset separate from the trails dataset.

It should be noted that this inventory effort focused at the statewide level and, as such, some local trails that are useful for transportation may have been overlooked. While all local GIS data submitted for this effort contributed to building this inventory (and additional efforts were made to review as many local plan maps as possible) it was not feasible to identify and incorporate every possible transportation trail in this initial inventory.<sup>2</sup> Moreover, this network is not intended to be the definitive network, but rather a starting point. It is expected that the statewide transportation trail network will grow as local jurisdictions and others continue to coordinate and exchange information over time.

### *Descriptive Data for the Transportation Trails*

Currently, the dataset for the transportation trails network includes only the following: length, status, missing link status missing link type; county and city location, data source, and component trail of one or more of the five national or regional trails that pass through Maryland. The dataset also includes names for many but not all of the trails. Additional data about the trails was sought as part of the data collection process (see TSIP Transportation Trail Inventory Addendum), including trail width, surface type, condition, trail type, presence of lighting, owning/managing agency, and so forth. However, sufficient information about these attributes was not available. As a result, this analysis of the transportation trails network cannot address these more detailed factors as they may reflect on the overall condition and utility of the trails as transportation facilities.

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<sup>2</sup> A number of cities and counties have developed extensive trail master plans including Anne Arundel County, Baltimore City, Frederick County and City, Montgomery County, Rockville, Gaithersburg, Prince George's County, Bowie, and Saint Mary's County.

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## **2.0 Connectivity Analysis**



## 2.0 Connectivity Analysis

A key effort of the TSIP is to identify and prioritize important missing links in the statewide transportation trails network. A related effort is to expand the network to maximize the number of people and destinations served by the system. As underscored by a public opinion survey conducted for the TSIP, closing gaps in the system is the single most important improvement that current trail users feel would enable them to use trails more for transportation purposes.

In addition to encouraging more utilitarian biking and walking on trails, Maryland is committed to developing trails as infrastructure that supports economic development, especially in the rural communities of the Eastern Shore and Western Maryland. Trails stimulate and support local economic development in two ways: by enabling ecotourism opportunities and by adding to the diversity of activities that a destination community offers. Trails make communities more attractive and engaging.

Given these overarching themes, both a connectivity and service needs analysis was conducted.

To assess transportation trail service needs, the following analyses were conducted:

- **Proximity Analysis** - Assesses the residential population's proximity to existing and proposed trails to identify areas with the largest numbers of potential trail users. This analysis assessed proximity based on one-half mile and one-mile distances from the trail.
- **Underserved Communities** - Identifies underserved communities with medium or high-density populations.
- **Trails for Economic Development** - Identifies communities that could benefit from the development of destination trails and the Trail Town initiative. This discussion includes the relationship of local trails to regional and national trails such as the Great Allegheny Passage and East Coast Greenway.
- **Base Realignment and Closure (BRAC) Impact Areas** - Discusses major new developments and BRAC impact areas where planned development provides an opportunity for closing gaps and serving underserved communities.

To assess transportation trail connectivity needs, the following analyses were conducted:

- **Interstate Linkages** - Identifies existing and potential linkages to Pennsylvania, Delaware, the District of Columbia, Virginia, and West Virginia.
- **Physical Barriers Analysis** - Identifies physical barriers that make closing gaps in the trail network difficult, as well as potential solutions.

- **Identification of Missing Links** - Describes the method for identifying continuity gaps in the existing trail system and evaluating their recorded status, viability, and need.

As a result of these analyses, a set of priority missing links were established (see Attachment A). Associated with each of these links are attribute data that can assist in future prioritization by state or local jurisdictions. The purpose of developing these priority missing links is to provide a list of trail projects upon which state and local government can focus near-term trail planning efforts. The inventory associated with the TSIP represents the first systematic identification of gaps in the statewide transportation trail system.

The remainder of this addendum will describe the processes used and resulting findings of the service needs and connectivity analyses. These analyses provided the groundwork for establishing the proposed list of priority missing links discussed below.

## ■ Priority Missing Links

The connectivity analysis resulted in identification of 161 missing transportation trail links, totaling approximately 771 miles of new trail (see Attachment A for a comprehensive list). These links were identified because they contributed in one or more of the following ways to the statewide transportation trail network:

- Serve a significant population that currently has few or no transportation trails;
- Have the potential to contribute to economic development in a destination community or region;
- Are needed to expand the trails system in a BRAC impact area;
- Are needed to improve connectivity to neighboring states;
- Are needed to overcome or circumnavigate a barrier to bicycle and pedestrian travel; and/or
- Are needed to close a gap in the existing trail system or otherwise improve continuity and connectivity of existing or planned trails; including connectivity to rail transit stations.

Each of the 161 missing links were first organized in groups based upon similar attributes related to the length and primary purpose of the trail.<sup>3</sup> The groups are defined as follows:

- **Service Links** - These are defined as longer corridors within and between major population and employment centers that lack existing trail service or linkage to nearby trails in the statewide network. Generally, these links are greater than two miles in length.
- **Continuity Links** - These are defined as links between existing or planned trails that are generally less than two miles in length. Continuity gaps also include trails that link to transit stations. This group of links constitutes those that are needed to create a more continuous trail network and capitalize on intermodal opportunities.

The second criterion for prioritization is the link's maturity in the planning process, such as its status and prospect for realization (see the discussion of Trail Status in Section 1 of this Addendum). For example, is the link planned, proposed, potential, or as yet uninvestigated? Classifying the missing links in this manner allows early priorities to be identified on the basis of gross project size and project readiness. Combining the link type and the status created a more detailed classification of the 161 missing links into six distinct groups as shown in Table 2.1.

**Table 2.1 Summary of Missing Link Types**

	Number of Locations	Mileage
<i>Trail Continuity Links</i>		
Planned Continuity Link	14	16.7
Proposed Continuity Link	51	69.3
Potential Continuity Link	12	11.1
Continuity Links Subtotal	77	97.1
<i>Trail Service Links</i>		
Planned Service Link	9	75.0
Proposed Service Link	29	165.8
Uninvestigated and Potential Service Links	46	433.3
Service Links Subtotal	84	674.1
<b>Total</b>	<b>161</b>	<b>771.2</b>

<sup>3</sup> The length of a missing link serves as a gross assessment of the magnitude of the level of effort and money required to close the gap, however it does not take into consideration the potential need for major structures such as bridges, walls or underpasses. None of the available attributes for the missing links addresses the prospective engineering difficulties, or the magnitude of bridges and other structures that might be needed to build them.

## Prioritization Criteria

In addition to identifying the gap type, planning maturity and trail length, the attributes used to identify missing links can be further used to prioritize them. When identifying missing links for this effort, only one of the criteria below was necessary in order to add the link to the initial list. However, to further prioritize the links, links that speak to multiple criteria can be ranked higher than those that address only one or two criteria. Furthermore, future prioritization tasks might consider weighting the various criteria based upon an agreed relative value of each criterion.

For this initial prioritization effort, the following criteria were used to identify missing links:

- Population density within one-half mile of missing link;
- Location in an underserved community and population density of the community;
- Economic development potential (i.e., Trail Towns candidate);
- Part of a major national or regional trail;
- Located in a BRAC impact area;
- Crosses jurisdictional boundaries within Maryland;
- Provides a missing interstate linkage or access to an existing linkage;
- Is within one-half mile of a rail transit station;
- Is within one-half mile of a rail transit station where transit-oriented development is slated; and
- Type or number of barriers crossed or circumvented.

## Prioritization Criteria Considered, But Not Recommended

Other prioritization criteria were considered, but ultimately were not deemed to be suitable for use as part of this initial effort. These criteria are described below.

- **Trail Length** - Other than as a characteristic to group missing links of similar physical scope, trail length is not a very meaningful attribute by which to prioritize trail links. It does not provide any information about the potential benefit of a particular trail, or provide an indication of the opportunities present that may facilitate trail construction.
- **Trail Density** - It would be difficult to develop a metric that relates linear mile of trail to land area and population. Because land form, land use and the layout of the built

environment have such a significant effect on either limiting or providing trail opportunities would be very difficult to create a metric that was widely applicable throughout the State. Moreover, even if a metric was established, focusing trail development efforts to achieve the metric may seem arbitrary to both the public, elected officials and professional staff working on trail development.

- **Safe Routes to Schools Eligibility** - Safe Routes to Schools is a Federal program administered by each state that provides funding for projects that facilitate children walking to school. It would be difficult for Maryland to determine the eligibility of each individual trail project because the characteristics of the physical environment and the behaviors of school children in that area are factors used in eligibility determination.

## **Prioritization Criteria for Future Consideration**

There are other criteria that also might be considered for use as part of future project prioritization efforts; however, the data needed to apply these criteria are either not available, not fully developed, or may not be sufficiently accurate. Developing these data would be necessary before any of the following criteria could be used.

- **Availability of Right-of-Way** - The nature and availability of right-of-way is critical to any trail project. Various types of ROW have various types of constraints, which can relate to topography, ownership, institutional disposition, compatibility of uses, physical size, competing interests, costs of development, etc. In general, the following types of ROW typically present a degree of opportunity for trail development: 1) abandoned or little used rail corridors; especially spur lines or old trolley/interurban lines; 2) stream corridors; 3) Road or highway corridors; 4) electric power and other utility corridors; 5) major developments; 6) public lands, especially parks; and there are more). Trail development is typically easier on some types of ROW as compared to others, however particular circumstances also are critical and can create variance from the typical. Possibly, with further study the characteristics of various types of ROW can be scored regarding their favorability to trail development and an overall ROW opportunity score could be created.
- **Potential For A Trail To Garner Multiple Funding Sources And Broad Partnerships** - If matching funds are required for a certain state or Federal funding program, either the trail project has the required match secured or it doesn't, and thus is eligible or not. However, prior to seeking funding from a specific source or program, a new trail or trail project can be evaluated for its potential to garner funding support, especially in terms of the diversity of funding sources for which it may be eligible or the breadth of public and private partnerships that have coalesced to support the project.
- **Potential to Serve the Goals of the Partnership for Children in Nature Initiative** - This is a new initiative emerging out of a statewide partnership that is concerned that too many children and young people in Maryland are growing up without developing

an organic and experiential relationship with nature and thus a respect for the natural environment. Many trails, existing and proposed, provide both access to and effective venues for experiencing the natural environment. Trails are frequently close-to-home venues making regular visits possible. Trails and trail projects can be evaluated in a number of ways to assess their potential to contribute to the goals of this initiative.

- **Potential To Serve As An Environmental Or Heritage Education Resource** - While this criterion is almost identical to those noted above, it represents an approach that would these values in a less specific way. Whether or not a trail is in a heritage area, and whether or not it offers a close-to-home experience in nature many trails or trail amenity projects can contribute to environmental or heritage education, however, to address this criteria specific trail improvements must be included in a project, such as trail access to a special historic or natural feature in the corridor, interpretive sign programs, information centers at trailheads, or programming efforts by park agency or other staff.
- **Inclusion Of Design Elements That Contribute To Transportation Usage** - This criterion would only apply to trail projects, but could be applied to both new trail efforts and retrofits of existing trails. Specifically, this criterion would prioritize specific types of design elements that enable and promote greater transportation usage, such as installation of lighting, widening for highly used trails, elimination of at-grade crossings of major highways, safety improvements to at-grade roadway crossings, elimination of poor drainage or other features that reduce recovery time after major storm events. This criterion also could be applied to maintenance investments such as trail sweeping or snow removal equipment to increase safety and number of usage days in the winter.
- **Obesity, Heart Disease Or Diabetes Rates Of A Given Population** - As community health indicators, these criteria would act as good indicators of areas where there are great needs for increases in the daily exercise and activity levels. Close proximity to environments that are comfortable for walking, running, or bicycling, especially as part of the journey to work (or other utilitarian travel needs), are essential for individuals to increase their daily physical activity levels through outdoor exercise, and thus address these critical diseases.

However, in lieu of using these criteria to prioritize missing links, it may be more feasible to use them to evaluate a trail funding application. In this setting, the applicants can use locally available data, or generate the data as it relates to their individual trail, and the burden of generating statewide data is avoided. This would enable the reviewers of funding applications to use these criteria to compare trail proposals and rank applications within a given cycle.

## ■ Trail Service Needs and Connectivity Needs Analyses

The service needs and connectivity needs analyses that generated a set of missing trail links involved conducting a sequence of individual analyses that built upon each other. This included: a proximity analysis and population density analysis, identifying underserved communities, assessing general tourism and economic development potential, mapping the existing and planned routes of five national and regional trails that cross the State, identifying BRAC impact areas, identifying interstate trail linkage needs, mapping rail transit stations and identifying known plans for transit-oriented development at any of these stations, identifying major linear and area barriers, and identifying a set of missing links based on the service and connectivity needs revealed in these analyses.

The following sections provide a brief discussion of these analyses and the central findings of each.

## ■ Trail Service Needs Analysis

### Proximity Analysis (Access to Transportation Trails)

GIS data was used to conduct a proximity analysis of Maryland's residential population. This analysis found that Maryland's transportation trails network is well positioned to provide a significant sector of the population bicycle and pedestrian transportation options for both daily and periodic trip types. Fully 23 percent of Maryland's current population is living within one-half mile of an existing transportation trail (see Table 2.2 and Figure 2.1). A half mile was used as a proximity limit because typically trail users will not travel more than a half mile to access a trail for a typical transportation trip which may be only two to three miles in total length.

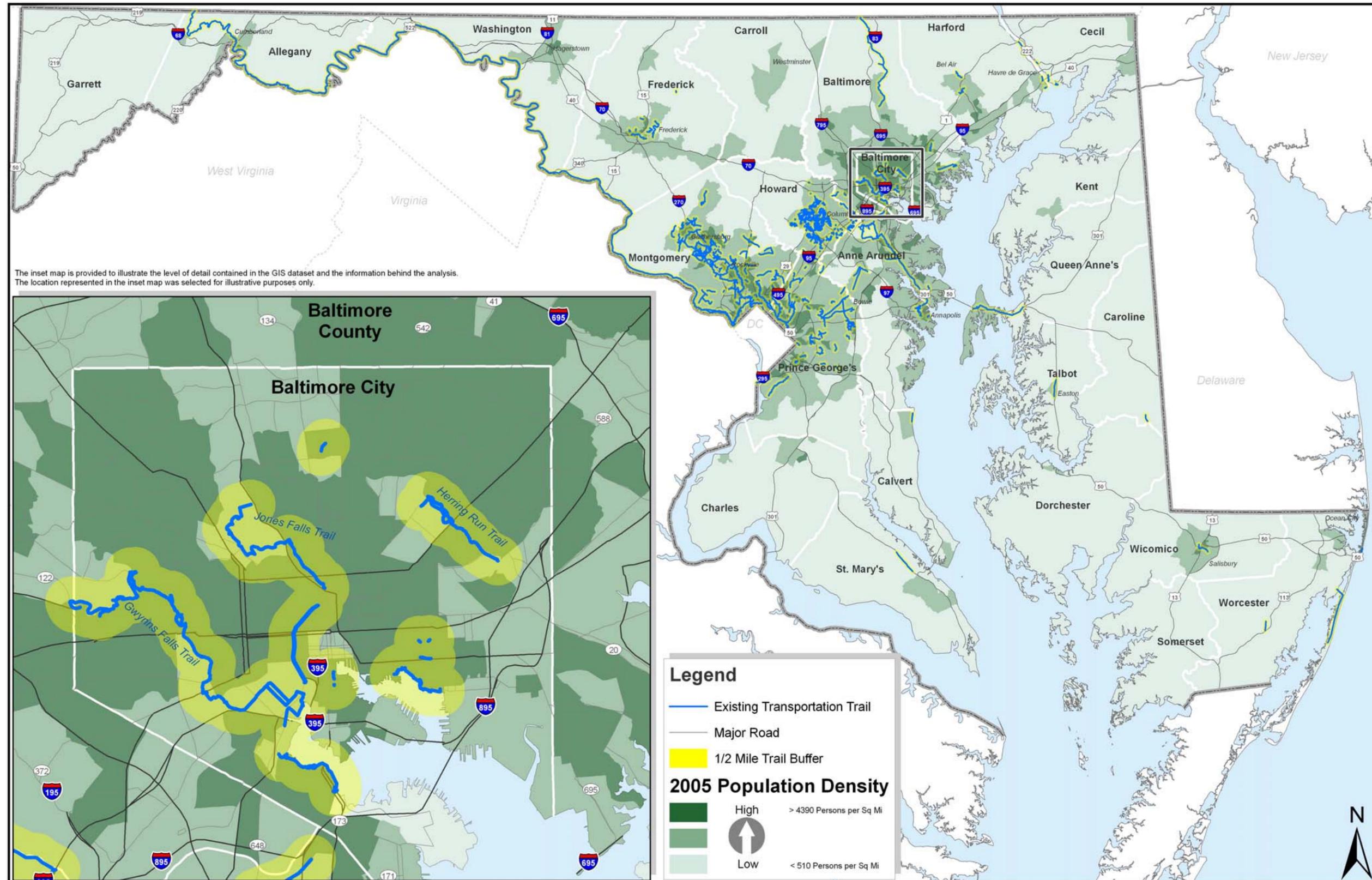
To provide a more general assessment of the population's proximity to trails, this analysis also calculated how many Marylanders live within one mile of a transportation trail. It also looked at proximity to the future trail network, as a prediction of potential proximity if select sets of planned and proposed trails were built out. The analysis revealed that if the currently planned trails and mature missing links (not potential or uninvestigated) were all built, 32.0 percent of Maryland residents would live within one-half mile of a transportation trail. If all of the transportation trails identified in this study were built, 50 percent of the population would reside within one-half mile of a trail. As can be expected, if the proximity threshold is expanded to one mile, an even greater portion of the population can be considered "close" to a trail.

**Table 2.2 Proximity Analysis Results**

	Existing Trails	Existing and Planned and Mature Missing Links	All Transportation Trails
<b>Trail Quantities Analyzed</b>	818 miles	1,298 miles	2,756 miles
<b>One-Half-Mile Buffer</b>			
Service Area	526 square miles	680 square miles	1,776 square miles
Total Population	1,307,248	1,829,155	2,803,798
Percentage of State Population within Buffer	23.0%	32%	50%
<b>One-Mile Buffer</b>			
Total Area	949	1,508	2,908
Total Population	2,206,036	2,914,202	3,869,475
Percentage of State Population within Buffer	39 %	52%	69%

Results of the proximity analysis can readily be transferred into performance metrics. For example, proximity to a trail could be used as a performance measure that would gauge the progress of state and local governments in expanding the transportation trails network and closing of gaps in the trail system. The proximity analysis also is useful for evaluating the potential benefit of a completing a missing link, or of completing a class of missing links. The potential population served, and the density of the community served also can be factored into the prioritization of missing link projects.

Figure 2.1 Maryland Population within One-Half Mile of Existing Transportation Trails



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## Underserved Communities

Statewide, a significant number of Maryland residents appear to have relatively good access to transportation trails. However, further analysis of the location of existing trails and of major population centers and communities revealed that many communities and population centers remain underserved. In other words, these locations have few or no trails in the area. Not only do these communities lack trails as a local transportation option, but they are not linked into the larger statewide transportation trails network.

In addition to underserved population centers, there also are a number of large planned communities for which transportation trail service may not have been fully addressed in their approval processes. Table 2.3 provides a list of 44 underserved or new communities that have no, or very few existing transportation trails. Table 2.3 also shows the estimated population and population density of the area. Figure 2.2 shows where these underserved areas are located throughout the State.

These underserved areas were useful in identifying new trail service and connectivity needs. The analysis of underserved areas also highlights the importance of potential or proposed trails in these areas because implementing these classes of trails would fulfill a significant need or eliminate an important gap in service or trail continuity. Moreover, missing links can be further prioritized based upon their location within or proximity to these underserved communities, or the potential numbers of people served in the community given its population and/or density.

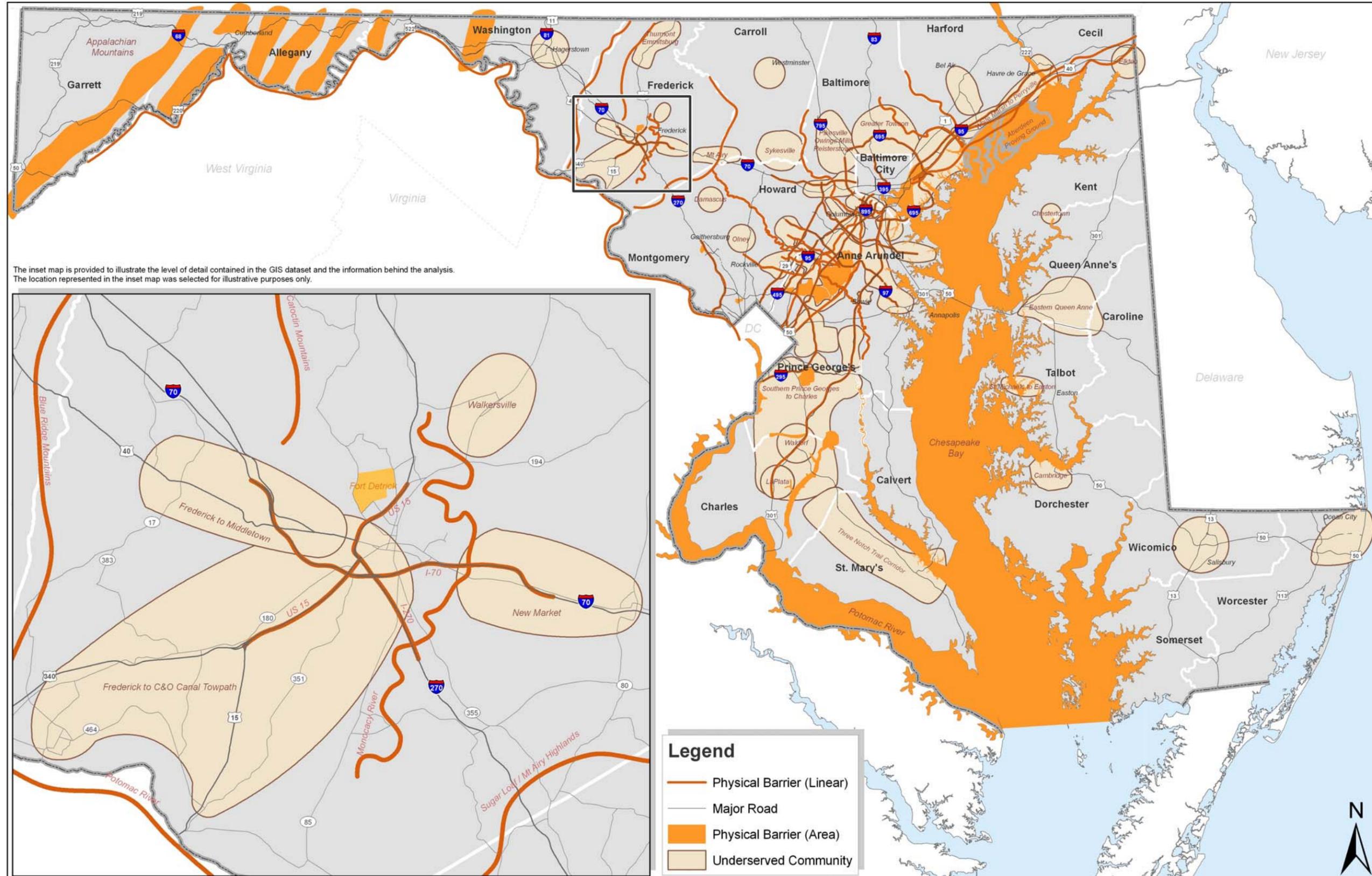
**Table 2.3 Underserved Communities**

Name	County	Population	Population Density per Square Mile
Crofton	Anne Arundel	19,203	3,782
Eastern Severn River Watershed	Anne Arundel/Howard	106,185	1,307
Glen Burnie	Anne Arundel/Baltimore City	52,271	2,632
Greater Towson	Baltimore	206,160	2,366
Perry Hall/White Marsh	Baltimore	221,147	2,535
Southern Baltimore County	Baltimore/Baltimore City/Anne Arundel	69,130	3,360
Westminster	Carroll	21,588	923
Sykesville	Carroll	33,147	719
Elkton	Cecil	18,333	670
LaPlata	Charles	23,096	830
Waldorf	Charles	61,129	1,642

**Table 2.3 Underserved Communities (continued)**

<b>Name</b>	<b>County</b>	<b>Population</b>	<b>Population Density per Square Mile</b>
Cambridge	Dorchester	12,753	415
Frederick to C&O Canal Towpath	Frederick	48,429	675
Frederick to Middletown	Frederick	22,014	1,270
New Market	Frederick	11,387	676
Walkersville	Frederick	5,730	775
Thurmont/Emmitsburg	Frederick	11,346	295
Mt. Airy	Frederick/Carroll	12,094	541
Bel Air to Aberdeen Proving Ground	Harford	67,038	1,787
White Marsh to Perryville	Harford/Cecil/Baltimore	81,321	1,031
Southern Howard	Howard	14,554	705
Maple Lawn Development (New Community)	Howard	250	429
Northeast Howard City	Howard/Anne Arundel	21,426	1,099
Southeast Howard City	Howard/Anne Arundel	20,061	2,038
Pikesville/Owings Mills/Reisterstown	Howard/Baltimore	160,069	2,602
Ellicott City	Howard/Baltimore	95,441	3,030
Chestertown	Kent	4,360	434
Damascus	Montgomery	13,203	851
Olney	Montgomery	33,389	1,760
Burtonsville	Montgomery	50,957	2,371
Central Prince George's	Prince George's	185,227	3,578
South Bowie	Prince George's	24,607	959
Lanham/Old Town Bowie	Prince George's	11,128	1,016
Konterra (Planned Community)	Prince George's	1,727	1,031
Laurel	Prince George's	45,114	3,277
Westphalia (New Community)	Prince George's	5,371	591
Beltsville	Prince George's	13,847	2,019
Southern Prince George's to Charles	Prince George's/Charles	262,978	961
Eastern Queen Anne's	Queen Anne's/Caroline/Talbot	6,885	66
Three Notch Trail Corridor	St. Mary's/Charles/Calvert	60,305	297
St. Michael's to Easton	Talbot	1,836	87
Hagerstown	Washington	58,769	1,670
Salisbury	Wicomico	60,624	790
Ocean City	Worcester	26,447	337

Figure 2.2 Maryland Communities Underserved by Transportation Trails and Physical Barriers to Trail Development



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## Trails for Economic Development

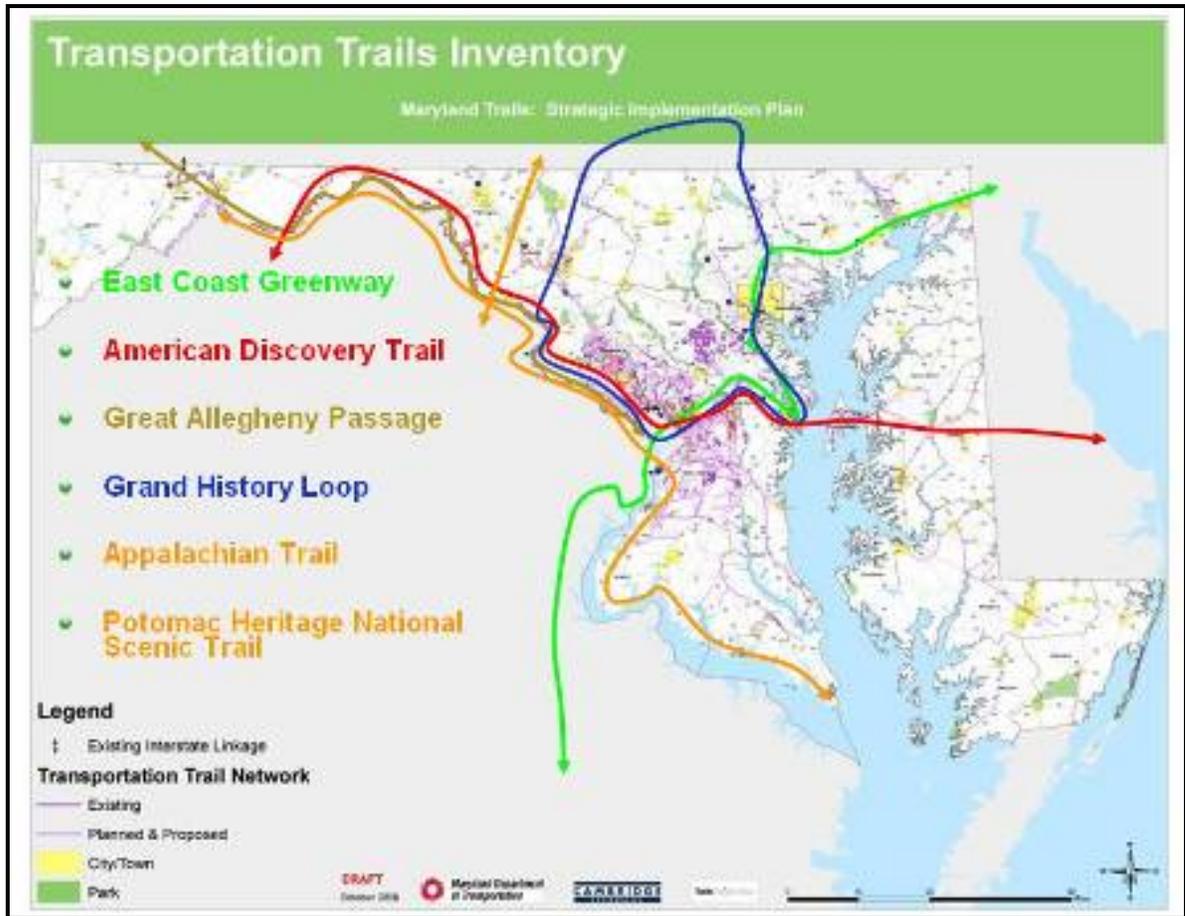
In addition to underserved communities, the connectivity analysis identified areas where development of trails is likely to create a significant tourism draw. These areas either already are identified as tourism destinations or could become a destination based up the scenic landscape, historic resources, or other recreational opportunities in the area.

- Corridor between Hagerstown and the Chesapeake & Ohio Canal Towpath (C&O Canal Towpath).
- Corridor between Frederick and the C&O Canal Towpath.
- Corridor between Frederick, Thurmont, and Emmitsburg.
- Corridor between Havre de Grace, Elkton, and Newark, Delaware.
- Corridor between Havre de Grace and Pennsylvania along the Susquehanna River.
- Corridor between the Cross Island Trail and Clayton, Delaware.
- Corridor between Easton and St. Michaels.
- Corridor between Cambridge and Salisbury.
- Ring Route between Salisbury, Ocean City, Snow Hill, and Somerset County/Crisfield.

### *National and Regional Trails*

There are several regional trails in Maryland that cross long distances and are assembled from links and segments of several smaller trails, see Figure 2.3. The major regional trail systems include the Great Allegheny Passage; the Grand History Trail; the American Discovery Trail; the East Coast Greenway; and the Potomac Heritage National Scenic Trail. These trails have the potential to act as catalysts for local trail interest as well as attract visitors and trail users from other parts of the State or country. Table 2.4 lists the number of missing transportation trail links which will contribute toward completion of each of these national or regional trails.

**Figure 2.3 Significant National and Regional Trails in Maryland**



**Table 2.4 Major Regional Trails**

Regional Trail System	Number of Links	Total Miles
East Coast Greenway	7	33.8
Great Allegheny Passage	1	2.8
Grand History Loop	5	27.5
American Discovery Trail	1	2.8
Potomac Heritage National Scenic Trail	6	51.8
<b>Total</b>	<b>20</b>	<b>118.7</b>

## Base Realignment and Closure (BRAC) Impact Areas

There are five military bases scheduled to expand under the BRAC process. The communities surrounding each of these bases will experience varying levels of redevelopment, commensurate with the number of new military personnel and civilian employees anticipated to be employed in association with each base. As these communities redevelop, opportunities will be presented to acquire ROW and construct trail segments. Additionally, growing populations will increase the need for trails in these communities. Addressing the impacts of BRAC on Maryland communities provides an opportunity to address long standing key service and continuity gaps in key Maryland communities, such as along the U.S. 40 corridor in Baltimore and Harford Counties, and around Ft. Meade in Anne Arundel and Howard Counties. There are a number of priority missing links in these communities that would not only help complete the statewide transportation trails network, but would provide increased commuting options to these military bases and surrounding development, as summarized in Table 2.5 and shown in the map in Figure 2.4.

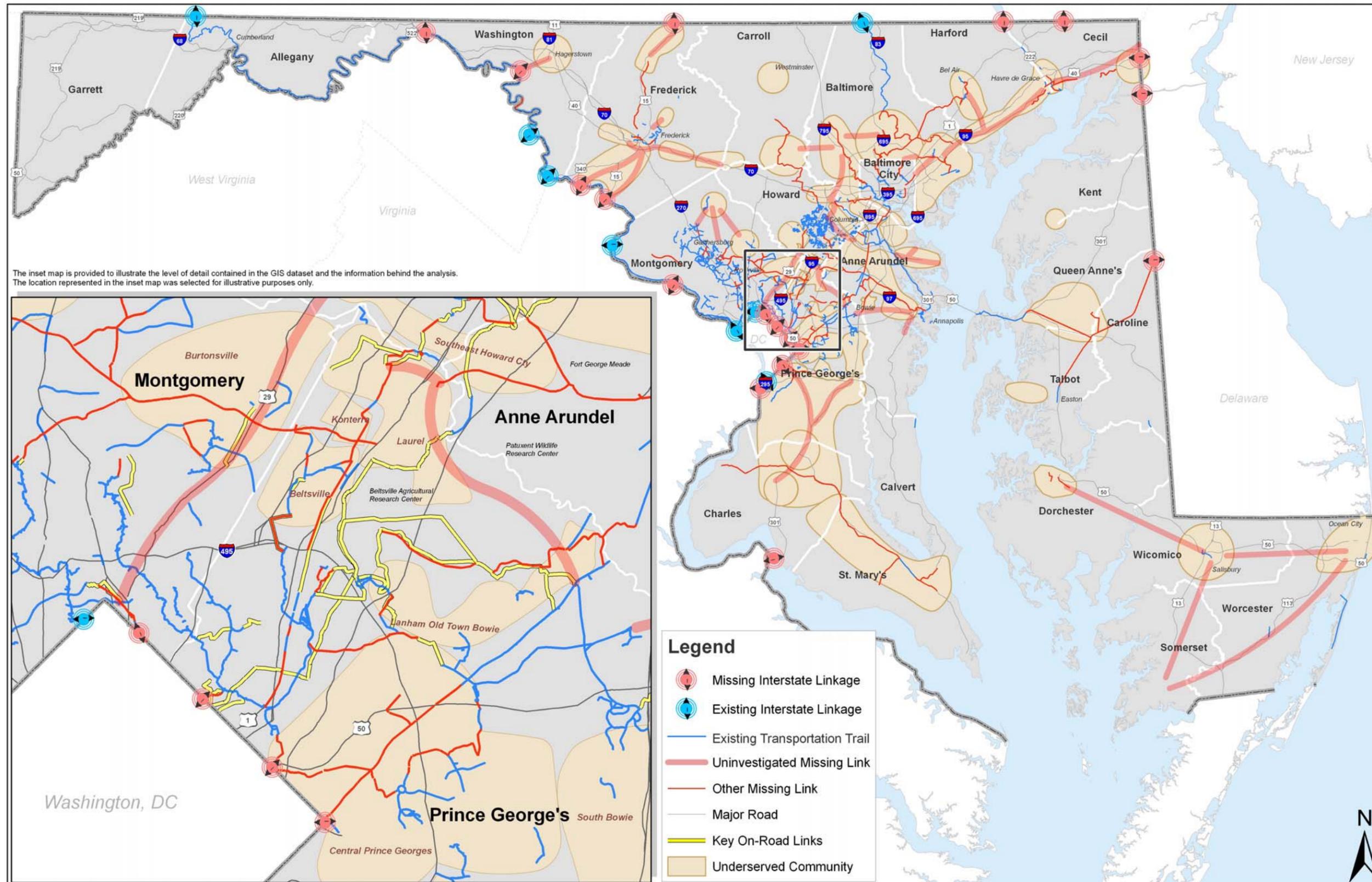
**Table 2.5 Trails in BRAC Impact Areas**

<b>Military Base</b>	<b>County<sup>a</sup></b>	<b>Number of Missing Links</b>	<b>Length (miles)</b>
Aberdeen Proving Grounds	Baltimore	2	13.13
	Baltimore and Cecil and Harford	1	37.11
	Cecil and Harford	1	2.79
	Harford	4	15.58
Andrews Air Force Base	Prince George's	2	30.21
Bethesda Naval Medical	Montgomery	1	2.45
Fort Detrick	Frederick	2	17.79
Fort Meade	Anne Arundel	6	31.67
	Anne Arundel and Baltimore	1	2.39
	Anne Arundel and Prince George's	1	6.26
	Howard	2	9.75
<b>Grand Total</b>		<b>23</b>	<b>169.12</b>

<sup>a</sup> Multiple counties listed indicates interjurisdictional trail.

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Figure 2.4 Connecting Maryland's Transportation Trail Network



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## ■ Trail Connectivity Needs Analysis

### Interstate Linkages

To serve both utilitarian transportation and economic development-oriented trails, 26 trail linkages between Maryland and its neighboring states were identified. The linkages identified in this study are significant to interstate travel because they represent connections on major regional trail systems or extensions of Maryland transportation trails into neighboring jurisdictions in communities with large populations, such as Montgomery and Prince George's Counties adjacent to the District of Columbia.

Table 2.6 shows three types of interstate linkages: a) existing; b) planned; and c) missing – those that do not exist, but would be desirable based upon future trail development needs in Maryland, the neighboring state, or both. Of the 26 linkages identified, 14 are classified as missing, 8 are existing, and 3 are planned. These connections are important because many parts of the State are integrally connected to surrounding jurisdictions and people regularly travel across state lines for access jobs, housing, and recreation. For a map of interstate linkages see Figure 2.4 and Regional Maps, Figures 2.5 through 2.9.

**Table 2.6 Interstate Linkages Identified**

Number	Status	Name	Maryland Jurisdiction	Neighboring Jurisdiction	Linkage Type
1	Existing	Great Allegheny Passage	Pennsylvania	Allegany	Trail
2	Existing	Northern Central Rail-Trail	Pennsylvania	Baltimore	Trail
3	Existing	CCT/C&O Canal Towpath	District of Columbia	Montgomery	Trail
4	Existing	Rock Creek Trail	District of Columbia	Montgomery	Trail to Park Road
5	Existing	White's Ferry	Virginia/Loudoun	Montgomery	Ferry
6	Existing	Oxon Cove Trail/S Capitol Street Trails	District of Columbia	Prince George's	Trail and Bridge
7	Existing	C&O Canal Towpath/Harpers Ferry Link	West Virginia	Washington	Trail on RR Bridge
8	Existing	C&O Canal Towpath/MD34/Shepherdstown	West Virginia	Washington	Improved Highway Br w/ Trail
9	Missing	Easton to Clayton Rail-Trail	Delaware	Caroline	None - Trail Proposed
10	Missing	Chesapeake and Delaware Canal	Delaware	Cecil	None - Trail Proposed
11	Missing	East Coast Greenway	Delaware	Cecil	Roadway - Trail Proposed
12	Missing	Octoraro Rail-Trail	Pennsylvania	Cecil	None - Trail Proposed
13	Missing	Nice Bridge/U.S. 301 Potomac Crossing	Virginia	Charles	Call for a Ride
14	Missing	Brunswick/MD 17	Virginia/Loudoun	Frederick	Unimproved Highway Bridge
15	Missing	Emmitsburg/Gettysburg Link	Pennsylvania	Frederick	Roadway
16	Missing	Point of Rocks/U.S. 15	Virginia/Loudoun	Frederick	Unimproved Highway Bridge
17	Missing	Susquehanna River Heritage Greenway	Pennsylvania	Harford/Cecil	None - Trail Proposed
18	Missing	C&O Canal Towpath/Algonkian Park Link	Virginia/Loudoun	Montgomery	None - Proposed Ferry
19	Missing	Chesapeake Beach/Watts Branch Trails	District of Columbia	Prince George's	None - Trail Proposed
20	Missing	Suitland Parkway/Oxon Run Trails	District of Columbia	Prince George's	None - Trail Proposed
21	Missing	C&O Canal Towpath at Hancock	West Virginia	Washington	None - Trail Proposed
22	Missing	C&O Canal at Williamsport	Virginia/Jefferson	Washington	Unimproved Highway Bridge
23	Planned	Anacostia Gateway	District of Columbia	Prince George's	Trail
24	Planned	Anacostia River Trail	District of Columbia	Prince George's	Boardwalk Underpass Trail
25	Planned	Metropolitan Branch Trail	District of Columbia	Montgomery	Trail to Sidewalk
26	Planned	Wilson Bridge	Virginia/Fairfax	Prince George's	Trail on Bridge

## Intermodal Linkages

A number of rail transit systems service Maryland, including the Maryland Transit Administration's (MTA) Light Rail and Metro (Red Line) in the Baltimore area, the Washington Metropolitan Area Transit Authority (WMATA) Metro in the greater Washington, D.C. area, and the Maryland Area Regional Commuter (MARC) stations located statewide. Using GIS data, Maryland's 99 rail transit stations were evaluated for their proximity (within one-half mile) to a trail in any of the following groups: 1) existing; 2) a missing link; or 3) other planned/proposed/potential (P/P/P) transportation trail.

- Fifty-four of Maryland's 99 rail transit stations are within one-half mile of an existing transportation trail.
- Thirty-nine rail transit stations are within one-half mile of a missing link.
- Sixty-six rail transit stations are within one-half mile of a planned, proposed, or potential transportation trail.

These findings suggest that up to two-thirds of Maryland's rail transit lines already are or can be made accessible by trail. A comprehensive evaluation of accessibility would require that each individual station be reviewed.<sup>4</sup> Such a review would determine whether the distance from the trail to the station is actually traversable by bicycle or walking as well as what the quality of the physical connection (i.e., is it a trail or a sidewalk along a roadway? Are there on-road bicycle facilities?)

### *Transit-Oriented Development (TOD) at Passenger Rail Stations*

Using data provided by the MDOT, further analysis was conducted surrounding trail proximity to stations where TOD is planned or proposed. Ten missing links are within one-half mile of more than one (two to four) rail transit stations. Four of these missing links are close to stations with TOD proposed, as shown in Table 2.7. A total of 22 missing links are within one-half mile of at least one station with TOD proposed. A total of 43 missing links are within one-half mile of at least one rail transit station. These findings suggest a strong relationship between many missing links and their potential to improve access to rail transit and surrounding new development.

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<sup>4</sup> Some of this work may have been completed in the Access 2000 study and its 2002 update, undertaken jointly by the State Highway Administration and Maryland Transit Administration.

**Table 2.7 Missing Links within One-Half Mile of More Than One Rail Station**

Name	County	Length (miles)	Link Type (Service or Continuity)	Status	Rail Transit Stations within One-Half Mile	TOD Slated within One-Half Mile	Station Names
Baltimore to Linthicum Light Rail-Trail	Anne Arundel and Baltimore	2.4	Continuity	Proposed	4	0	Baltimore Highlands, Nursery Road, North Linthicum, Linthicum
Jones Falls Trail	City of Baltimore	3.9	Service	Planned	3	0	Mount Washington, Cold Spring Lane, Woodberry
Light Rail with Trail - Lutherville	Baltimore	2.5	Service	Proposed	3	0	Timonium Business Park, Luthersville, Timonium
Bethesda Trolley Trail	Montgomery	2.5	Continuity	Planned	2	2	Twinbrook, White Flint
Metropolitan Branch Trail	Montgomery	1.3	Continuity	Proposed	2	2	Silver Spring Metro, Takoma Park Metro
Gwynns Falls Trail	Baltimore and City of Baltimore	15.8	Service	Potential	2	1	Old Court, Owings Mills
Rhode Island Avenue Trolley Trail	Prince George's	2.3	Continuity	Planned	2	1	College Park Metro, Riverdale
Jones Falls Trail Extension	City of Baltimore and Baltimore County	1.9	Service	Potential	2	0	Mount Washington, Falls Road
Oxon Run Trail	Prince George's	1.1	Continuity	Potential	2	0	Naylor Road, Southern Avenue Metro
Suitland Parkway Trail	Prince George's	6.3	Continuity	Potential	2	0	Suitland, Naylor Road

## **Physical Barriers Analysis**

Despite being a small state in land area, Maryland has a number of physical barriers that create challenges to trail development within the State. While a particular trail project may face any number of relatively smaller barriers, such as stream crossings, wetlands, or arterials with large traffic volumes, the barriers addressed by this plan are of statewide significance, including major mountain ranges, rivers, interstate highways and railroads, and large landholdings with limited access. Examples include the Patapsco River Valley, the beltways around Baltimore and Washington, D.C., and the Fort George G. Meade Army Base in Anne Arundel County. Due to the location, layout, design, security or other access management needs, these barriers have few or no trail crossings today. Furthermore, constructing new trails is likely to be challenging due to engineering complexity, project cost, and/or political/jurisdictional obstacles.

While some of these barriers are not major concerns because of their location away from major population centers, many create significant challenges for developing transportation trail linkages between communities and activity centers. However, a lack of trail connectivity means that bicycle and pedestrian travelers must use on-road routes or alternative trail routes that circumvent the barrier, but involve longer travel distances. On-road routes or circuitous trail routes are less preferred to many existing and prospective trail users, making the choice of nonmotorized travel modes less desirable and thus limiting the State's ability to achieve its goals for growth of bicycling and walking for transportation. Moreover, major barriers create breaks in the national and regional trail systems that pass through Maryland, such as the East Coast Greenway or American Discovery Trail, making use of these routes in their Maryland section less attractive and more difficult to market.

The barriers addressed by this plan are classified in two categories: linear barriers and area barriers. Linear barriers are those that are relatively narrow, but may run for tens or hundreds of miles. Examples include highway corridors, urban beltways, rail corridors, and major rivers and mountain ranges. These features effectively break trail connectivity because they cannot be easily circumvented.

Area barriers include large landholdings, large bodies of water or geologic features with limited or no through trail connectivity. Examples include military installations and other Federal facilities where access is controlled, the Appalachian and Blue Ridge Mountains and major water bodies such as the Chesapeake Bay and its many feeder rivers.

The following sections provide a general overview of the barriers found in different parts of the State and highlight some of the more significant challenges, and potential solutions, see Figure 2.2 for the locations of barriers discussed.

**Western Maryland (Frederick County, Carroll County, Washington County, Allegany County, Garrett County)**

In the western part of the State, mountain ranges from the Catoctin Mountain in the Blue Ridge range to the Appalachian Mountains in the Cumberland Plateau would typically make trail development a monumental challenge. However, thanks to the work of past generations in building the C&O Canal and many railroad lines, and the foresight of more recent generations to convert some of these unused transportation corridors to trails, communities in the western part of the State are largely linked and no longer have major trail connectivity needs.

In the most densely populated portion of Western Maryland, the Frederick area, major highways such as I-70, I-270, and U.S. 15 divide the community into sections. These highways provide only select opportunities for trail connectivity across them, and as the area continues to grow in population trails along linkages across these highways will become increasingly important.

Throughout Western Maryland, the Potomac River creates a barrier to making trail connections to communities in Virginia and West Virginia. While there are highway bridges distributed throughout the river corridor, most are lacking in adequate bicycle or pedestrian accommodations, and some have none at all. Many of these bridges are quite old and as upgrades take place should have bicycle and pedestrian facilities added to the bridge decking, as well as trail links to and from the C&O Canal Towpath which typically passes under the bridge at river elevation. The State Highway Administration’s (SHA) recent improvements to the MD 34 Bridge to Shepherdstown, West Virginia is an excellent example. Table 2.8 presents the linear and area barriers in this region of the State.

**Table 2.8 Key Linear and Area Barriers in Western Maryland**

<b>Linear Barriers</b>	<b>Impacted Areas</b>	<b>Barrier Type</b>
Catoctin Mountains (Blue Ridge Mountains)	City of Frederick, Middleton, Myersville	Mountain
I-270	City of Frederick	Highway
I-70	City of Frederick, New Market, and Mt Airy	Highway
U.S. 15	City of Frederick	Highway
Potomac River	Users of the C&O Canal Towpath	River
Monocacy River	City of Frederick, New Market	River
South Mountain (Blue Ridge Mountains)	Frederick and Washington Counties	Mountains
Sugar Loaf Mountain and Mt Airy Highlands (Blue Ridge Mountains)	Montgomery, Frederick, and Carroll Counties	Mountains
<b>Area Barriers</b>		
Dan’s Mountain, Warrior Mountains, Roundtop (Appalachian Mountains)	Garret, Cumberland, and Washington counties	Mountains

***Central Maryland (Anne Arundel County, City of Baltimore, Howard County, Montgomery County, Prince George's County)***

Central Maryland is carved up by a host of major highways and railroads, including I-95, the Baltimore-Washington Parkway, Routes 1, and 29, the Baltimore and Washington Beltways, and other Interstate Highways. These barriers are compounded by the CSX and Amtrak rail lines which also run in the corridor. A major example of the divide that is created is Columbia, Maryland's separation from Anne Arundel County; there are no existing trail linkages between Howard and Anne Arundel counties. Another example is I-270 and the CSX line to Point of Rocks, which effectively divide the Montgomery County communities of Gaithersburg and Rockville in half.

Northeast-southwest running barriers are further compounded by those running northwest-southeast such as MD 100, MD 32, and the Patuxent River tributaries. Add to that, Ft. Meade, the Patuxent Wildlife Refuge, and the Beltsville Agricultural Research Center, major Federal landholdings with no trail connectivity through their interiors, and trail connectivity faces challenges in every direction.

These barriers effectively stop the following trail connections:

- Between Prince George's and Anne Arundel Counties (although the planned Patuxent River Bridge on the W B & A Trail near Bowie, Maryland will provide valuable connectivity in the northern part of these two counties),
- Between Laurel and Columbia,
- Between Columbia and the BWI Airport, and overall
- Between Washington, D.C. and Baltimore City.

Towards the southern end of the Washington-Baltimore corridor, the Capital Beltway (I-95/I-495) impedes trail connectivity between the Route 1 inner-beltway communities of Prince George' County with points to the north and east of the beltway. The planned Inter County Connector has the potential to block trail connectivity across the route if existing and planned trails are not integrated into the overall project design from the beginning. Table 2.9 presents the linear and area barriers in this region of the State.

**Table 2.9 Key Linear and Area Barriers in Central Maryland**

<b>Linear Barriers</b>		
Amtrak Railroad (NE Corridor)	Prince George's County, Anne Arundel County	Railroad
CSX Rail	Prince George's County, Anne Arundel County	Railroad
I-270	Montgomery County	Highway
I-495 Capital Beltway	Montgomery County, Prince George's County	Highway
I-695 Baltimore Beltway	Baltimore City, Baltimore County, Anne Arundel County	Highway
I-70	Baltimore County, Howard County	Highway
I-95	Baltimore City, Howard County, Prince George's County	Highway
I-97	Anne Arundel County	Highway
Inter County Connector	Montgomery County, Prince George's County	Highway
MD 10/MD 270	Anne Arundel County	Highway
MD 100	Anne Arundel County	Highway
MD 100	Howard County	Highway
MD 197	Prince George's, Anne Arundel County	Highway
MD 29	Montgomery County, Howard County	Highway
MD 295 (B/W Parkway)	Prince George's County, Anne Arundel County	Highway
MD 301	Prince George's County	Highway
MD 32	Anne Arundel County, Howard County, Prince George's County	Highway
MD-198/I-95 Interchange	Prince George's County	Highway
Patuxent and Middle Patuxent Rivers	Howard County	River
Patapsco River	Anne Arundel, Howard County, Baltimore City	River
<b>Area Barriers</b>		
Lower Patuxent River	Anne Arundel County, Prince George's County	River
Fort Meade/NSA	Anne Arundel County	Military Base
Patuxent Wildlife Refuge	Anne Arundel County	Natural Area
Andrews Air Force Base	Prince George's County	Military Base
Beltsville Agricultural Research Center	Prince George's County	Federal Institution
National Institutes of Health and National Naval Medical Center.	Montgomery County	Federal Institutions
National Institutes of Standards and Technology	Montgomery County	Federal Institution

### ***North Central Maryland (Baltimore City, Baltimore County, Harford County)***

In Baltimore City, the Jones Falls, Jones Falls Expressway (I-83), and MTA Light Rail Line pose challenges for developing trails that run east to west due to the relatively steep terrain on each side of the Jones Falls and the width of the Jones Falls Expressway itself. I-95, rail lines, and industrial land uses on the east and northeast side of Baltimore impede trail connectivity out of the city to the east-northeast towards Dundalk, Rosedale, and Perry Hall.

Outside the City, the counties and communities to the north have relatively few existing or planned trails. A combination of highways, railroads, steep terrain, and existing development patterns combine to form a complex of barriers that surround the entire northwest, north, and northeast boundaries of the City. Yet, due to relatively dense development in the Baltimore suburbs and expected increases in population and development in these communities and further to the northeast (in the Aberdeen Proving Ground/BRAC impact area) transportation trail needs are expected to increase significantly.

Major barriers in this area include: 1) the Baltimore Beltway, I-95/U.S. 40/MD 7 series of highways between Baltimore City and Havre de Grace; and 2) the CSX and Amtrak rail lines that parallel these roadways, and the irregular coast line of the Chesapeake Bay and its many feeder tributaries, bays and wetlands. Additional barriers that make east-west trails difficult to develop include the I-83, I-795, Little Gunpowder and Gunpowder Falls, the Lock Raven Reservoir, and the piedmont ridges that run north-south along the Jones Falls, Gwynns Falls, and Patapsco rivers.

To the north of Baltimore City the suburbs of Towson/Luthersville/Hunt Valley are separated from those to the west along the Reisterstown Road (MD 140 I-795) corridor, as well as those to the east such as Perry Hall, White Marsh and Essex.

The roads and railroads in the I-95 corridor separate the communities north and west of the corridor, such as Bel Air and Kingsville from Joppatown, Edgewood, Aberdeen and Havre de Grace. Most of the population is located west of the road and rail corridors, but the Aberdeen Proving Ground (APG) and some waterfront residential communities are located to the east of these barriers. And many communities are sandwiched between the transportation facilities. The dynamics of these barriers present similar connectivity problems to those that impact the central portions of the State.

Further to the northeast, the Susquehanna River is a major impediment to north-south bicycle and pedestrian travel between Aberdeen/Havre de Grace and Perryville/Cecil County. Although there are several bridge crossings of the river, cyclists and pedestrians must call for a taxi ride across the Hatem Bridge (which is reported to be unreliable and costly) or use the Conowingo Dam Road (U.S. 1), which is significantly inland and removed from the population centers along the Bay. Table 2.10 presents the linear and area barriers in this region of the State.

**Table 2.10 Key Linear and Area Barriers in North Central Maryland**

<b>Linear Barriers</b>		
I-95	Baltimore, Harford, Cecil	Highway
I-695 Baltimore Beltway	Baltimore County	Highway
I-83 and I-795	Baltimore County	Highways
Jones Falls	Baltimore City and Baltimore County	River
Gunpowder Falls	Baltimore County	River
Little Gunpowder Falls	Baltimore County	River
Upper Patapsco River	Carroll County and Baltimore County	River
Susquehanna River	Harford County and Cecil County	River
<b>Area Barriers</b>		
East Baltimore Industrial Area	Baltimore City and Baltimore County	Industrial Area
Susquehanna River	Harford and Cecil Counties	Water Body
Loch Raven Reservoir	Baltimore	Water Body
Piedmont Ridges	Baltimore and Harford Counties	Mountains
Chesapeake Bay	Multiple Jurisdictions	Water Body
Aberdeen Proving Ground	Harford County	Military Base

***Southern Maryland (Southern Prince George’s County, Charles County, St. Mary’s County, Calvert County)***

Southern Maryland has gentle terrain, so there are no barriers attributable to major valleys and ridges. However, because southern Maryland is in the coastal plain, there are a number of swamps and wetlands (including Zekiah Swamp and Mattawoman Creek) that present challenges to the most important connectivity needs. The Patuxent River channel separates Calvert and St. Mary’s Counties for the length of their shared border. This isolates Leonardtown and the Patuxent Naval Air Station in St. Mary’s County from Solomon’s Island, a popular destination in southern Calvert County.

There is significant interest in a bicycle and pedestrian connection across the Potomac River that would link southern Maryland with Virginia’s Northern Neck. Currently, the only Potomac River crossing south of the Wilson Bridge is on the Harry Nice Bridge which is a relatively narrow two-lane structure with toll facilities on the Maryland side. Bicycle travelers may call a taxi for a ride across the bridge, but there are no other options currently available.

***Eastern Shore (Cecil County, Kent County, Queen Anne's County, Talbot County, Dorchester County, Wicomico County, Somerset County, Worcester County)***

Maryland's Eastern Shore is separated from the western part of the State by the Chesapeake Bay, the main barrier facing trail connectivity between the State's population centers and its eastern shore. Currently, there is no direct bicycle or pedestrian connection across the Bay at any point between Elkton and Virginia. Once on the Eastern Shore, the development pattern is relatively low density with large distances between population centers. Subsequently, the demand for transportation trails is anticipated to be relatively low in comparison with the more densely populated portions of the State. Many of the Eastern Shore communities are isolated by tributaries to the Chesapeake Bay, making travel between them circuitous regardless of mode.

***Overcoming/Circumventing Physical Barriers***

A wide variety of strategies can be employed to overcome or circumvent a physical barrier to trail development. The following list of potential solutions is organized by barrier types:

**Large Bodies of Water/Limited Access Toll Facilities**

- Franchise small ferry services.
- Retrofit bridges during rehabilitation project to provide bicycle and/or pedestrian accommodations on major bridges, and special signals for safety.
- Provide public bus service with bike racks to cross toll facilities.
- Use fire roads or maintenance roads around reservoirs.

**Highways**

- Retrofit road ROWs at noninterchange roadway crossings of major highways with trails or sidepaths.
- Use abandoned grade separated railroad crossings.
- Co-use railroad crossing underpasses along active rail lines or spurs.
- Co-use stream culverts for trails, especially along stream corridors.
- Reroute the trail to make use of an existing pedestrian overpass.
- Build a new overpass or underpass.

### **Railroad Lines**

- Build new underpasses or overpasses of railroads, especially in locations where adjacent terrain provides elevations that reduce the extent of structures and cost.
- Use passenger rail station stations for trail crossings of rail lines.
- Use existing roadway crossings of railroads, retrofits may be necessary.
- Cross under railroads where they cross over streams or rivers on a trestle or bridge.

### **Rivers**

- Use existing roadway crossings of rivers for trail crossings, retrofits may be necessary.
- Use old road or rail crossings for new trail crossings of rivers.
- Build a new bridge.

### **Wetlands**

- Boardwalks.
- Co-use other built ROWs (railroads or roadways).

### **Mountains and Ridges**

- Use abandoned railroad, canal or road ROWs.
- Use fire roads in forested lands.
- Use existing roads.
- Use public transit services (bus or rail); ensure that they will transport bicycles.

### **Military Bases and Other Limited Access Federal or State Institutions**

- Use perimeter trails to circumvent military bases or other institutional barriers.
- Subdivide areas within an institutional property to allow for public access (or limited public access) in select areas or corridors. Existing ROWs are prime candidates, such as public roads, power lines, or railroads. Stream corridors or undeveloped natural areas on the property also can be considered.

### **Large Tracts of Protected Lands (State or Federal Conservation Areas, Private Land with Conservation Easements)**

- See to modify the terms of the agreement or management policies.
- Ensure that future land protections efforts consider reserving areas for trail access where it is appropriate and in keeping with the overall environmental objectives leading to a protected status.

### **New Developments or Transportation Facilities that are Large in Scale**

- Ensure that trails and key crossings are planned and built as a part of the development process. This should apply to: Major Private Developments, Major Public Developments, New Highways, New Rail Transit Lines or Busways, Transit-Oriented Development, and BRAC Impact Area Development Plans

### **Industrial Areas**

- Circumvent it with a peripheral trail.
- Convert an unused rail lines within the area to a trail.
- Retrofit a key roadway within the area with a sidepath.

Identification of additional service and continuity gaps. Identification of rail, power line, and roadway corridors that may present opportunities for closing gaps.

### **Identification of Missing Links**

The analyses described above resulted in the identification of 161 missing links that include planned, proposed, potential, and uninvestigated trails throughout the State. Figures 2.5 through 2.9 show existing transportation trails, missing links, transit stations, and underserved communities at the regional level. Attachment A presents the complete list of missing links and their associated data. These links will serve underserved communities, connect communities that currently do not have trail connections, fill gaps in the existing trail system, provide important links to rail transit, introduce new trails in communities that would benefit from economic development, and help complete some of the national and regional trails that pass through the State.

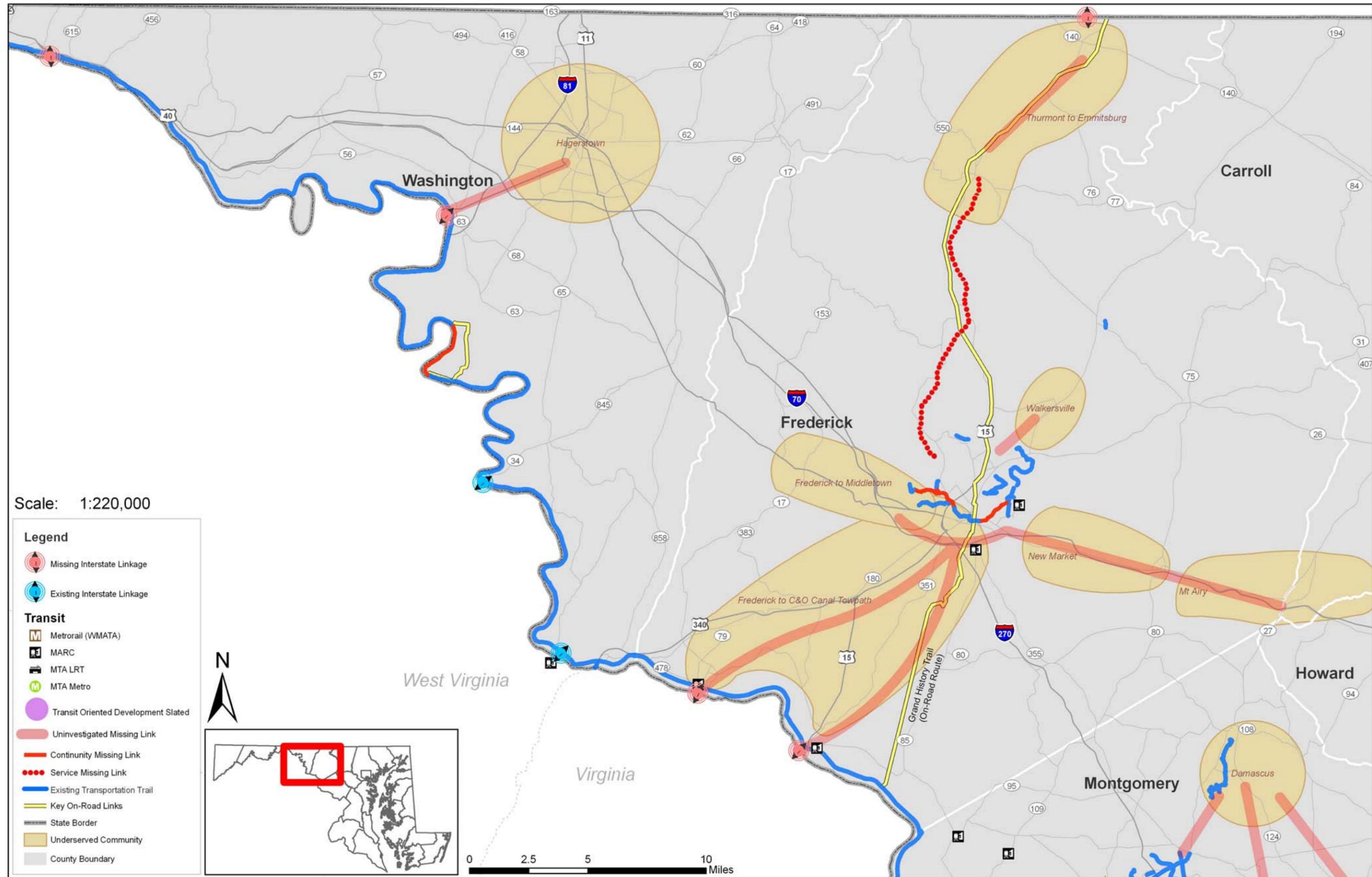
Identifying these missing links was conducted through the use of both quantitative and qualitative methods. Furthermore, the scale for this analysis was based on using planning level data, which by definition is general in nature. Following is an overview of the process that was used to identify missing links.

- Missing links identified in previous plans were reviewed and sometimes extended or eliminated based on criteria critical for transportation usage, such as connectivity, relationship to everyday destinations, or relationship to population centers.

- Major population centers with few or no trails were identified and conceptual trail links were developed to connect these communities with neighboring communities with known or predicted social or resident-employment relationships.
- New linkages in the emerging trail system were identified based on close proximity of existing but disconnected trails, trail user efficiency needs (shortest distance between two places), expected development patterns, and identification of major population centers that should be connected to the statewide transportation trail network.
- Planned, proposed, and potential trails already identified in local jurisdiction plans were studied and evaluated for their likelihood of contributing to the major connectivity and continuity needs described above.
- Known trail linkage priorities of jurisdictions were considered.
- The need for better trail-transit connectivity in some communities was considered, especially where local plans already identified potential trail alignments.
- Public input collected as a part of the TSIP effort and comments from TSIP Advisory Committee members helped identify potential trail links.

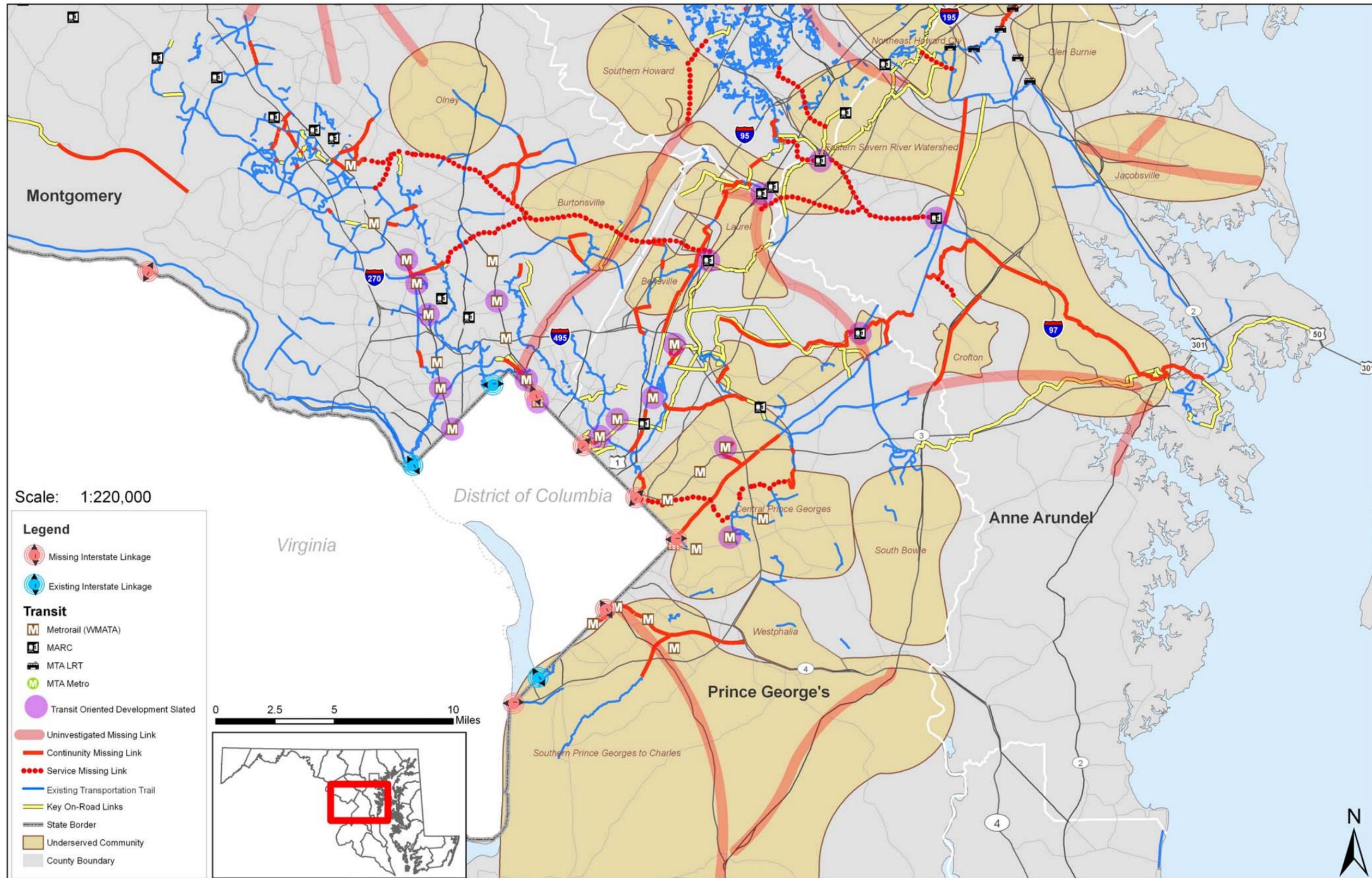
It is important to note that the list of missing links compiled as part of the TSIP effort is the first attempt at identifying a formal set of Statewide missing links and should therefore not be viewed as a complete or static set of needs. There are a number of communities that this effort was not able to address fully, and others that have not done much local planning. For example, further analysis of Washington, Carroll and Baltimore Counties would likely result in the identification of additional linkage needs in the communities of Hagerstown, the I-795 corridor, the Towson/Timonium area, Westminster, and other locations. Figures 2.5 through 2.9 provide a regional perspective on Maryland's transportation trail network in selected areas and illustrate how existing trails and missing links connect communities, underserved areas, transit, and surrounding states.

Figure 2.5 Existing Trails and Missing Links in Western Maryland (Washington and Frederick Counties)



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Figure 2.6 Existing Trails and Missing Links in Central Maryland (Montgomery, Prince George's, and Anne Arundel Counties)

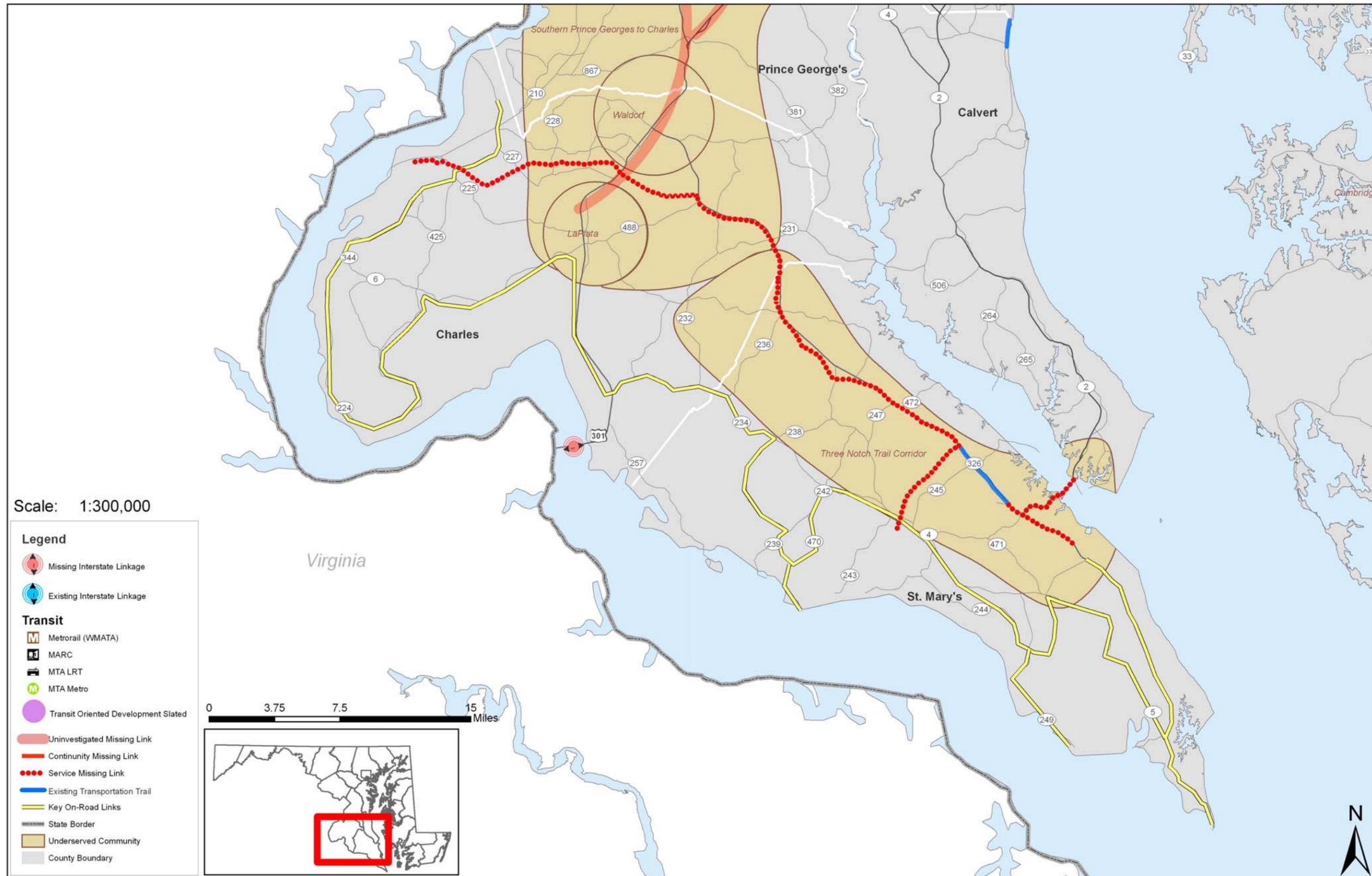


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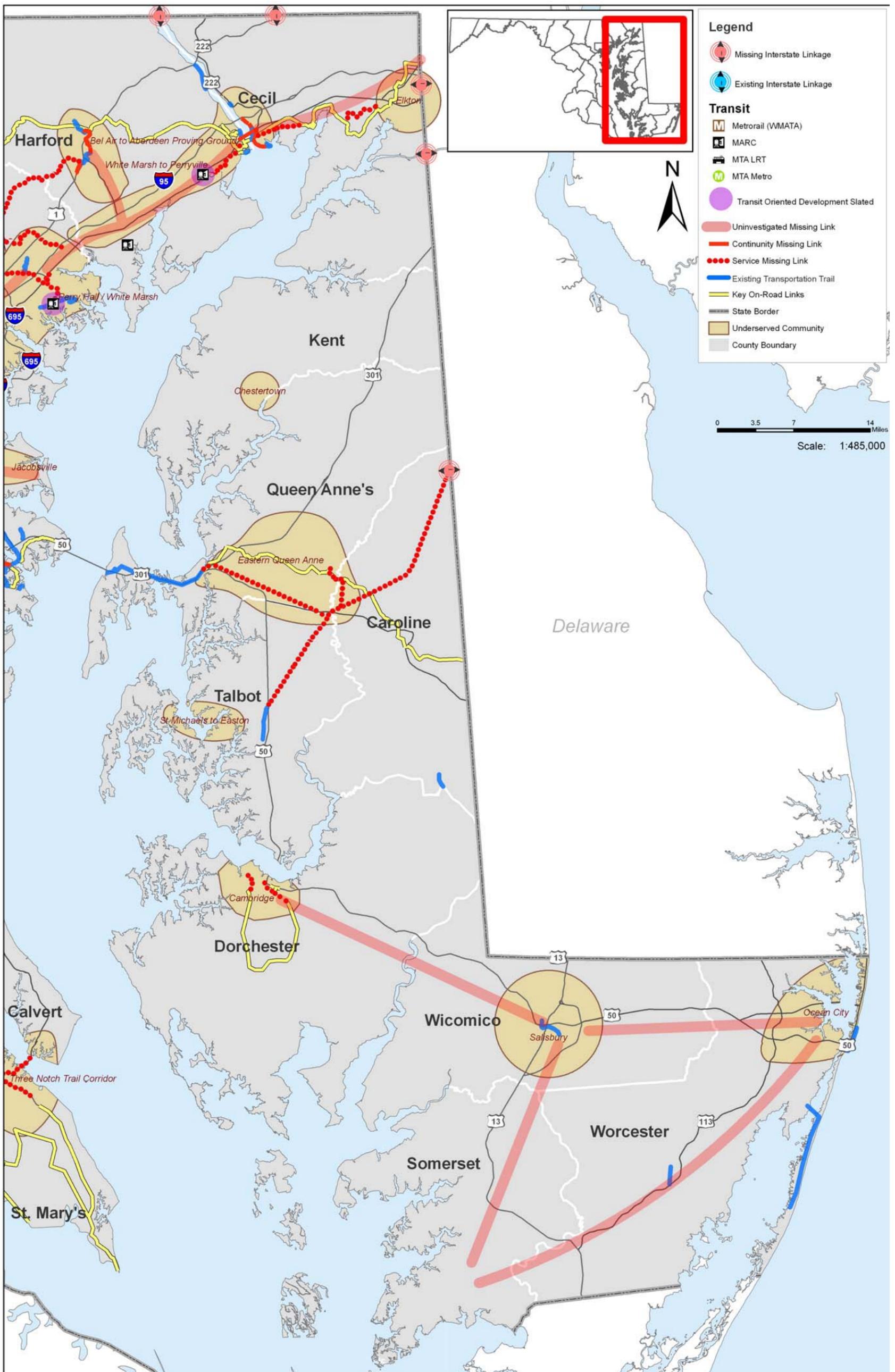
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Figure 2.8 Existing Trails and Missing Links in Southern Maryland (Prince George's, Charles, St. Mary's, and Calvert Counties)



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**Figure 2.9 Existing Trails and Missing Links in Maryland's Eastern Shore (Cecil, Kent, Queen Anne's, Caroline, Talbot, Dorchester, Wicomico, Somerset, and Worcester Counties)**



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## ■ Next Steps – Opportunities and Recommendations

### Opportunities for Further Research

The TSIP project team has assessed need and proposed linkages based on trail and missing links data. It is important to note that information is still at a preliminary planning level; it has not been confirmed with each individual jurisdiction. It is recommended that MDOT provide the jurisdictions represented in the GIS dataset with an opportunity to review the missing links information and confirm or update the GIS attributes, including trail name, planning status, and so forth. This addition will result in validation of existing data and additional confidence in the GIS database that has been developed.

Another platform for additional refinement is prioritization methodology. As presented, there is no weighting of the different prioritization criteria included in the transportation trails missing links dataset. For instance, a trail link located near a known TOD site is weighted the same as one located near a potential Trail Town. Similarly, a trail project that is in the early stages of conception is weighted the same as a project that is planned and designed. Future weighting of various prioritization criteria provides Maryland an opportunity to assign values that represent specific policies and emphasis areas.

As a result of the TSIP effort, MDOT now has a GIS dataset and associated documentation from which it can perform a variety of inquiries that can inform and advance Maryland's trail initiatives. Some suggestions for future analysis include:

- Developing a prioritization scheme that assigns weights to one or more of the criteria described in this addendum.
- Assessing the implications of trail needs in light of any other state initiatives, such as redefining the “Smart Growth” priority funding areas, promoting TOD, managing BRAC planning, or promoting healthy lifestyles.
- Identifying where missing links may coincide with SHA highway construction and rehabilitation activities.
- Identifying where missing links may coincide with state or local land preservation/land acquisition activities.
- Facilitating the participation of MDOT's Modal Administrations and other state agencies outside of the Department in further developing criteria to prioritize missing trail link lists.

## Recommendations for Further Consideration

In addition to future analytic opportunities presented by the TSIP GIS database, the TSIP consultant team has generated the following recommendations for further consideration:

- MDOT and its Modal Administrations as well as partner agencies (Maryland Department of Planning, Department of Natural Resources, Department of Business and Economic Development, and the Department of General Services) may consider incorporating the information on missing links into their planning, design and real estate projects, and development review processes. It also is suggested that MDOT encourage local jurisdictions to utilize this missing link data to ensure that trails are incorporated in the early stages of public and private projects. It also will allow trail projects to be noted by partner agencies and thus will allow them to capitalize on the resources available from related activities under the purview of these partner agencies.
- Explore ways that state or local agencies can advance transportation trail gap closures in the statewide transportation trails network. Some suggestions include:
  - Build sidepaths or other trail connections in conjunction with appropriate road improvements or design road improvements that allow for trail retrofitting in the future;
  - Incorporate the planning and development of trail facilities in appropriate transit projects and in transit-oriented development projects;
  - Consider trails in BRAC-related projects, especially along the U.S. 40 and MD 24 corridors; and
  - Engage local governments in identifying transportation trails and priority missing links in their local plans so that they will be more easily incorporated in future public or private development projects.
- Develop an on-line interactive map of the statewide transportation trail network that allows users to view and use the data developed as a part of this effort. There also exists potential to connect this on-line map to the new Greenprint on-line data set, which would clearly underscore the State's commitment to environmental goals.
- Explore methods for transferring the GIS trail database to other state agencies and local jurisdictions to allow for efficient use and proactive updating of GIS trail database with information provided from these partners.
- Develop a formalized process for regularly communicating about and promoting the statewide transportation trails with state agencies and local jurisdictions.
- Consider implementing a performance monitoring system for trail development. Given that a significant portion (23 percent) of Maryland's population currently lives within one-half mile of an identified transportation trail and because building the mature missing links and other planned trails would increase this percentage to 32 percent, a sample performance measure may be "percentage of communities within one-half mile proximity to a transportation trail."

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# **Attachment A**

*Missing Trail Links*



**Table A.1 Missing Links**

O ID	Name	Length (miles)	Link Type	Status	Source	County	City	Multijurisdictional within MD (Yes/No)	Is an Interstate Linkage (Yes/No)	Economic Development Potential (Yes/No)	In a BRAC Impact Area (Yes/No)	Population within Half Mile	Population Density in Half-Mile Buffer	Located in Underserved Community	Number of Rail Transit Stations within Half Mile	Station Names	Within One-Half Mile of Rail Station with TOD Slated	Station Names	Number of Barriers Circumvented	Grand History Loop	Great Allegheny Passage	East Coast Greenway	American Discovery Trail	Potomac National Scenic Heritage Trail	
1	Route 29 Corridor (North)	2.5	Service	Potential	Balt Reg BGP Plan (SCI)	Howard						2,036	3.3	Yes	0		0		1						
2	Adkins Arboretum Trail	4.7	Service	Planned	TSIP Public Input	Caroline and Queen Anne's		Yes		Yes		375	5.4	Yes	0		0								
3	All Saints Road Sidepath	0.7	Continuity	Proposed	TDG New	Howard						4,631	1.4	Yes	0		0								
4	Anacostia Gateway Trail	0.7	Continuity	Planned	Prince George's County	Prince George's			Yes			10,510	1.5		1	West Hyattsville Metro	1	West Hyattsville Metro		Yes		Yes	Yes		
5	Anacostia River Trail	1.2	Continuity	Planned	MDOT Missing Links	Prince George's			Yes			4,543	1.9	Yes	0		0			Yes		Yes			
6	Annapolis Junction Rail Trail	5.0	Service	Proposed	TDG New	Anne Arundel					Yes	3,385	5.8	Yes	1	Savage MTA	1	Savage MTA	6						
7	Ardwick Ardmore Sidepath	0.8	Continuity	Proposed	TSIP Public Input	Prince George's						4,129	1.6	Yes	1	New Carrollton Metro	1	New Carrollton Metro							
8	BGE Power Line Trail	2.6	Service	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	City of Baltimore						20,273	3.4		0		0		1			Yes			
9	BWI to Odenton Connector	5.4	Service	Needed	TDG New	Anne Arundel					Yes	12,280	6.1	Yes	1	Odenton MTA	1	Odenton MTA	2	Yes		Yes			
10	Baltimore Road Sidepath	0.5	Continuity	Proposed	Montgomery County MNCPPC	Montgomery	Rockville	Yes				5,129	1.3		0		0								
11	Baltimore to Linthicum Light Rail-Trail	2.4	Continuity	Proposed	MDOT Missing Links	Anne Arundel and Baltimore		Yes				7,430	3.0	Yes	4	Baltimore Highlands, Nursery Road, North Linthicum, Linthicum	0		2	Yes		Yes			
12	Beaverdam Creek Trail	1.8	Continuity	Proposed	Prince George's County	Prince George's			Yes			6,257	2.6	Yes	1	Odenton MTA	0		2						
13	Bethesda Trolley Trail	2.5	Continuity	Planned	Base TDG, Greenways Atlas, SHA Bike Map	Montgomery					Yes	21,163	3.8		2	Twinbrook, White Flint	2	Twinbrook, White Flint	1						
14	Bohrer Park Connector	0.1	Continuity	Proposed	City of Gaithersburg (TDG)	Montgomery	Gaithersburg					3,120	0.9		0		0								

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**Table A.1 Missing Links (continued)**

O ID	Name	Length (miles)	Link Type	Status	Source	County	City	Multijurisdictional within MD (Yes/No)	Is an Interstate Linkage (Yes/No)	Economic Development Potential (Yes/No)	In a BRAC Impact Area (Yes/No)	Population within Half Mile	Population Density in Half-Mile Buffer	Located in Underserved Community	Number of Rail Transit Stations within Half Mile	Station Names	Within One-Half Mile of Rail Station with TOD Slated	Station Names	Number of Barriers Circumvented	Grand History Loop	Great Allegheny Passage	East Coast Greenway	American Discovery Trail	Potomac National Scenic Heritage Trail
15	W B & A Trail (Patuxent Crossing) (RT Spur)	0.9	Continuity	Planned	City of Bowie	Prince George's						1,456	1.7		0		0		Yes		Yes			
16	Bowie State University Connector	1.4	Continuity	Potential	TDG New	Prince George's						1,254	2.1	Yes	1	Bowie State	1	Bowie State		Yes		Yes		
17	C&O Canal Towpath - Big Slackwater Gap	2.8	Continuity	Planned	MDOT Missing Links	Washington				Yes		334	3.5		0		0			Yes		Yes	Yes	Yes
18	Cabin Branch Trail	2.9	Continuity	Proposed	Prince George's County	Prince George's						16,751	3.6	Yes	1	Cheverly Metro	0							
19	Cambridge to Salisbury Connector	26.6	Service	Needed	TDG New	Wicomico and Dorchester		Yes		Yes		6,537	27.4	Yes	0		0							
20	Capital Crescent Trail	0.9	Continuity	Planned	Montgomery County MNCPPC	Montgomery			Yes			15,642	1.7		1	Silver Spring Metro	1	Silver Spring Metro						
21	Carroll Creek Trail	3.9	Continuity	Proposed	City of Frederick	Frederick	Frederick	Yes			Yes	15,070	5.1	Yes	0		0		2	Yes				
22	Catonsville Short Line Trail	1.8	Service	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	City of Baltimore						16,859	2.5	Yes	0		0							
23	Cedar Lane Sidepath	1.4	Service	Proposed	TDG New	Howard						6,237	2.2	Yes	0		0		1					
24	Chesapeake Beach Connector	10.3	Service	Needed	TDG New	Prince George's				Yes		7,810	11.0	Yes	0		0		1					
25	Columbia to BWI Connector	5.9	Service	Needed	TDG New	Howard					Yes	17,215	6.7	Yes	1	Dorsey MTA	0		4					
26	Columbia to Elkridge Connector	3.6	Service	Needed	MDOT Missing Links	Howard						9,988	4.4	Yes	0		0		2					
27	Columbia to Owings Mills Connector	8.0	Service	Needed	TDG New	Baltimore and Howard		Yes				29,229	8.8	Yes	0		0		2					
28	Crofton Connector	1.1	Continuity	Proposed	TSIP Public Input	Anne Arundel						1,632	1.9		0		0							
29	Cross County Trail	1.0	Service	Potential	Base TDG, Greenways Atlas, SHA Bike Map	Queen Anne's						196	1.8	Yes	0		0						Yes	
30	Cross County to Easton Clayton Connector	11.6	Service	Potential	Base TDG, Greenways Atlas, SHA Bike Map	Queen Anne's and Talbot		Yes		Yes		882	12.4	Yes	0		0					Yes		
31	Damascus to Germantown	2.8	Service	Needed	TDG New	Montgomery						3,249	3.6	Yes	0		0							
32	Damascus to Olney Connector	5.4	Service	Needed	TDG New	Montgomery						2,026	6.2	Yes	0		0							
33	Damascus to Rockville	5.5	Service	Needed	TDG New	Montgomery						11,731	6.3	Yes	0		0							
34	Darnestown Sidepath	0.2	Continuity	Planned	TDG New	Montgomery	Rockville					2,665	1.0		0		0							

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Table A.1 Missing Links (continued)

O ID	Name	Length (miles)	Link Type	Status	Source	County	City	Multijurisdictional within MD (Yes/No)	Is an Interstate Linkage (Yes/No)	Economic Development Potential (Yes/No)	In a BRAC Impact Area (Yes/No)	Population within Half Mile	Population Density in Half-Mile Buffer	Located in Underserved Community	Number of Rail Transit Stations within Half Mile	Station Names	Within One-Half Mile of Rail Station with TOD Slated	Station Names	Number of Barriers Circumvented	Grand History Loop	Great Allegheny Passage	East Coast Greenway	American Discovery Trail	Potomac National Scenic Heritage Trail
35	Downtown Columbia Waterfront	0.1	Continuity	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	Howard	Columbia					3,501	0.9		0		0							
36	EAGLES HEAD CONNECTOR	0.1	Continuity	Proposed	City of Gaithersburg (TDG)	Montgomery	Gaithersburg					3,268	0.9		0		0							
37	ECG Segment 1: Principio Furnace Corridor	4.4	Service	Proposed	ECGA	Cecil				Yes		2,012	5.2	Yes	0		0		1			Yes		
38	ECG - Beaverdam Road Trail	3.4	Continuity	Proposed	TDG New	Prince George's						2,554	4.1		0		0		2	Yes		Yes		
39	ECG Duckettown Connector	1.4	Continuity	Proposed	Prince George's County	Prince George's						1,179	2.2		0		0		2	Yes		Yes		
40	ECG Segment 1: Mason Dixon Trail	4.3	Service	Proposed	ECGA	Cecil				Yes		2,112	4.8		0		0					Yes		
41	ENM - S - Hurlock Rail-Trail	2.9	Service	Planned	TSIP Public Input	Dorchester				Yes		1,934	3.7	Yes	0		0							
42	East-West Baltimore County Link	5.5	Service	Needed	TDG New	Baltimore						6,926	6.3	Yes	0		0							
43	Easton to Clayton Rail-Trail	29.1	Service	Proposed	Town of Easton	Talbot and Caroline and Queen Anne's		Yes	Yes	Yes		3,379	29.9	Yes	0		0							
44	Ednor Road Sidepath	0.7	Continuity	Proposed	Montgomery County MNCPPC	Montgomery						933	1.4		0		0							
45	Essex Farm Park Trail	0.8	Service	Proposed	TDG New	Baltimore						3,543	1.6	Yes	0		0					Yes		
46	FESTIVAL CONNECTOR	0.1	Continuity	Proposed	City of Gaithersburg (TDG)	Montgomery	Gaithersburg					4,351	0.9		0		0							
47	Fairland Road Sidepath	0.8	Continuity	Proposed	TDG New	Montgomery						4,907	1.6	Yes	0		0							
48	Frederick to Harpers Ferry C&O Canal Towpath Connector	12.5	Service	Needed	TDG New	Frederick				Yes		6,511	13.3	Yes	1	Frederick MARC	0		3					Yes
49	Frederick to Mt. Airy Connector	12.0	Service	Needed	TDG New	Frederick						8,451	12.8	Yes	0		0		3					
50	Frederick to Point of Rocks C&O Canal Towpath Connector	11.4	Service	Needed	TDG New	Frederick				Yes		5,143	12.1	Yes	1	Point of Rocks CSX	0		3					
51	Garden City Drive Sidepath	0.8	Continuity	Proposed	Prince George's County	Prince George's						4,320	1.5	Yes	1	New Carrollton Metro	1	New Carrollton Metro						
52	Gilford Spur Rail with Trail	3.8	Service	Potential	MDOT Missing Links	Howard	Columbia	Yes			Yes	6,594	4.5	Yes	0		0							

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**Table A.1 Missing Links (continued)**

OID	Name	Length (miles)	Link Type	Status	Source	County	City	Multijurisdictional within MD (Yes/No)	Is an Interstate Linkage (Yes/No)	Economic Development Potential (Yes/No)	In a BRAC Impact Area (Yes/No)	Population within Half Mile	Population Density in Half-Mile Buffer	Located in Underserved Community	Number of Rail Transit Stations within Half Mile	Station Names	Within One-Half Mile of Rail Station with TOD Slated	Station Names	Number of Barriers Circumvented	Grand History Loop	Great Allegheny Passage	East Coast Greenway	American Discovery Trail	Potomac National Scenic Heritage Trail	
53	Good Luck Road Sidepath	3.8	Continuity	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	Prince George's						18,824	4.5	Yes	0		0		2						
54	Greenbelt Station Town Center Trails	1.5	Continuity	Proposed	Prince George's County	Prince George's						10,134	2.0		1	Greenbelt Metro	1	Greenbelt Metro	1	Yes		Yes			
55	Greenspring Branch Rail Trail	2.3	Service	Proposed	TDG New	Baltimore						4,745	3.0	Yes	1	Falls Road MTA	0			Yes		Yes			
56	Grist Mill Trail Extension	2.1	Service	Needed	TDG New	Howard				Yes		4,345	2.9	Yes	0		0		1						
57	Gunpowder Falls Trail	7.0	Service	Proposed	East Baltimore County PBA Plan	Baltimore					Yes	10,221	7.6	Yes	0		0		2						
58	Gwynns Falls Trail	15.8	Service	Potential	Base TDG, Greenways Atlas, SHA Bike Map	Baltimore and City of Baltimore		Yes				56,246	15.6	Yes	2	Old Court, Owings Mills	1	Owings Mills							
59	Hagerstown to C&O Canal Towpath Connector	5.5	Service	Needed	TDG New	Washington			Yes	Yes		9,760	6.3	Yes	0		0								Yes
60	Hanover Parkway Sidepath Extension	0.9	Continuity	Proposed	TDG New	Prince George's						6,156	1.6	Yes	0		0								
61	Hanover Road Sidepath	1.7	Continuity	Proposed	Anne Arundel Co	Anne Arundel						956	2.4	Yes	0		0		2						
62	Haven Street Rail-Trail	1.9	Service	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	City of Baltimore						15,375	2.6		0		0		1			Yes			
63	Havre de Grace Rail with Trail	2.0	Service	Proposed	TDG New	Harford	Havre de Grace			Yes	Yes	4,980	2.7	Yes	0		0		2			Yes			
64	Henson Creek Trail Extension	2.2	Continuity	Proposed	MDOT Missing Links	Prince George's					Yes	10,881	3.0	Yes	0	?	0	Naylor Road	1						
65	Herring Run Connector	2.0	Service	Needed	TDG New	Baltimore						19,591	2.8	Yes	0		0								
66	Herring Run Trail	3.4	Service	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	City of Baltimore						30,928	4.0	Yes	0		0								
67	I-270 Crossing at Quince Orchard	0.9	Continuity	Proposed	City of Gaithersburg (TDG)	Montgomery	Gaithersburg					8,565	1.6		1	Metropolitan Grove	0		1						
68	I-270/NIST TRAIL	0.8	Continuity	Proposed	City of Gaithersburg (TDG)	Montgomery	Gaithersburg					7,408	1.6		0		0		2						
69	ICC Trail System	18.2	Service	Proposed	Montgomery County MNCPPC	Montgomery and Prince George's		Yes				40,465	18.4	Yes	1	Muirkirk	1	Muirkirk	3						
70	Indian Head to White Plains Rail-Trail	13.0	Service	Planned	Base TDG, Greenways Atlas, SHA Bike Map	Charles						8,548	13.8	Yes	0		0		1						Yes

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**Table A.1 Missing Links (continued)**

O ID	Name	Length (miles)	Link Type	Status	Source	County	City	Multijurisdictional within MD (Yes/No)	Is an Interstate Linkage (Yes/No)	Economic Development Potential (Yes/No)	In a BRAC Impact Area (Yes/No)	Population within Half Mile	Population Density in Half-Mile Buffer	Located in Underserved Community	Number of Rail Transit Stations within Half Mile	Station Names	Within One-Half Mile of Rail Station with TOD Slated	Station Names	Number of Barriers Circumvented	Grand History Loop	Great Allegheny Passage	East Coast Greenway	American Discovery Trail	Potomac National Scenic Heritage Trail
71	Jacobsville Connector	9.2	Service	Needed	TDG New	Anne Arundel						23,133	10.2		0		0		1					
72	Jones Falls Trail	3.9	Service	Planned	MDOT Missing Links	City of Baltimore						17,963	4.2	Yes	3	Mount Washington, Cold Spring Lane, Woodberry	0		1	Yes		Yes		
73	Jones Falls Trail Extension	1.9	Service	Potential	Base TDG, Greenways Atlas, SHA Bike Map	City of Baltimore and Baltimore County		Yes				4,866	2.5	Yes	2	Mount Washington, Falls Road	0		1	Yes		Yes		
74	Konterra Trail	1.3	Continuity	Proposed	TDG New	Prince George's						2,061	2.1	Yes	0		0		1					
75	Landover Connector	2.7	Continuity	Proposed	Prince George's County	Prince George's						11,167	3.5	Yes	0		0		1					
76	Laurel Sidepath	0.3	Continuity	Potential	TDG New	Prince George's						5,351	1.0	Yes	0		0							
77	Leonardtown Three-Notch Connector	6.2	Service	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	St. Mary's				Yes		1,438	6.9	Yes	0		0							Yes
78	Light Rail with Trail - Lutherville	2.5	Service	Proposed	TDG New	Baltimore						8,674	3.3	Yes	3	Timonium Business Park, Luthersville, Timonium	0		1	Yes		Yes		
79	Light Rail with Trail - Cockeysville	1.5	Service	Proposed	TDG New	Baltimore						1,523	2.3	Yes	1	Warren Rd	0			Yes		Yes		
80	Little Paint Branch Trail	0.7	Continuity	Planned	MDOT Missing Links	Prince George's						3,719	1.5	Yes	0		0							
81	Little Paint Branch Trail - BARC	1.9	Continuity	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	Prince George's						6,531	2.6	Yes	0		0		2					
82	Little Patuxent Branch Trail Extension (Option 2)	0.9	Continuity	Potential	TDG New	Howard						4,129	1.6		0		0							
83	Little Patuxent Trail (North)	7.1	Service	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	Howard						8,544	7.9	Yes	0		0		1					
84	Little Patuxent Branch Trail Extension (Option 1)	0.3	Continuity	Planned	Howard County	Howard						2,756	1.1		0		0		1					
85	Loch Raven Reservoir Fire Road	11.9	Service	Proposed	TSIP Public Input	Baltimore						10,445	12.2	Yes	0		0			Yes		Yes		
86	Lower Susquehanna HG - Hatem Bridge Crossing	2.8	Continuity	Proposed	MDOT Missing Links	Cecil and Harford		Yes	Yes	Yes		3,421	3.3	Yes	0		0		3			Yes		
87	Lower Susquehanna H G - Perryville Waterfront Trail	1.5	Continuity	Planned	MDOT Missing Links	Cecil				Yes		1,004	2.3	Yes	0		0							

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**Table A.1 Missing Links (continued)**

O ID	Name	Length (miles)	Link Type	Status	Source	County	City	Multijurisdictional within MD (Yes/No)	Is an Interstate Linkage (Yes/No)	Economic Development Potential (Yes/No)	In a BRAC Impact Area (Yes/No)	Population within Half Mile	Population Density in Half-Mile Buffer	Located in Underserved Community	Number of Rail Transit Stations within Half Mile	Station Names	Within One-Half Mile of Rail Station with TOD Slated	Station Names	Number of Barriers Circumvented	Grand History Loop	Great Allegheny Passage	East Coast Greenway	American Discovery Trail	Potomac National Scenic Heritage Trail
88	Lower Susquehanna H G - Perryville Waterfront Trail Extension	1.3	Continuity	Potential	MDOT Missing Links	Cecil						945	2.1	Yes	0		0							
89	M A & P A Corridor	17.7	Service	Potential	TDG New	Baltimore and Harford		Yes		Yes		28,282	18.6	Yes	0		0		3			Yes		
90	MALCOLM KING PARK PATH	0.2	Continuity	Proposed	City of Gaithersburg (TDG)	Montgomery	Gaithersburg					5,590	0.9		0		0							
91	MD 108 Crossing	0.2	Continuity	Potential	TDG New	Howard	Columbia					2,081	1.0		0		0							
92	MD 182 Sidepath	0.9	Continuity	Proposed	Montgomery County MNCPPC	Montgomery						967	1.7		0		0							
93	MD 197 Corridor	8.2	Service	Needed	TDG New	Prince George's						17,820	9.0	Yes	1	Bowie State	1	Bowie State	3					
94	MD 198 Sidepath	6.3	Service	Proposed	TDG New	Anne Arundel and Prince George's		Yes			Yes	20,086	7.0	Yes	1	Laurel	1	Laurel	5					
95	MD 24 Corridor	6.8	Service	Needed	TDG New	Harford					Yes	21,558	7.6	Yes	0		0		1			Yes		
96	MD 28 Sidepath	1.5	Continuity	Proposed	Montgomery County MNCPPC	Montgomery						5,378	2.3		0		0							
97	MD 3 Sidepath	4.4	Service	Proposed	TDG New	Anne Arundel						13,265	5.2	Yes	0		0		2					
98	MD 355 Sidepath (Metro Connector)	0.7	Continuity	Proposed	Montgomery County MNCPPC	Montgomery	Rockville					5,795	1.7		1	Shady Grove Metro	0							
99	MD 43 Sidepath Extension	3.3	Service	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	Baltimore						3,267	4.0	Yes	1	Martin St. Airport	1	Martin St. Airport	1					
100	MD 450 Corridor	9.6	Service	Needed	TDG New	Prince George's						8,895	10.4	Yes	0		0		3				Yes	
101	MLK Sidepath	6.1	Service	Proposed	Prince George's County	Prince George's						30,521	7.0	Yes	1	Capitol Heights	0		1	Yes		Yes		
102	Ma and Pa Heritage Trail	4.6	Continuity	Proposed	Harford County	Harford					Yes	10,368	5.5	Yes	0		0					Yes		
103	Mariottsville Road Trail	2.7	Service	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	Howard						1,066	3.4		0		0							
104	Matthew Henson Trail	4.3	Service	Planned	Base TDG, Greenways Atlas, SHA Bike Map	Montgomery						28,158	5.0	Yes	0		0		1					
105	Metropolitan Branch Trail	1.3	Continuity	Proposed	Montgomery County MNCPPC	Montgomery			Yes			16,223	2.3		2	Silver Spring Metro, Takoma Park Metro	2	Silver Spring Metro, Takoma Park Metro						

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**Table A.1 Missing Links (continued)**

O ID	Name	Length (miles)	Link Type	Status	Source	County	City	Multijurisdictional within MD (Yes/No)	Is an Interstate Linkage (Yes/No)	Economic Development Potential (Yes/No)	In a BRAC Impact Area (Yes/No)	Population within Half Mile	Population Density in Half-Mile Buffer	Located in Underserved Community	Number of Rail Transit Stations within Half Mile	Station Names	Within One-Half Mile of Rail Station with TOD Slated	Station Names	Number of Barriers Circumvented	Grand History Loop	Great Allegheny Passage	East Coast Greenway	American Discovery Trail	Potomac National Scenic Heritage Trail
106	Minebank Run Trail	4.3	Service	Proposed	East Baltimore County PBA Plan	Baltimore						8,088	5.0	Yes	0		0		2			Yes		
107	Montrose Parkway Sidepath	1.6	Continuity	Proposed	Montgomery County MNCPPC	Montgomery						13,902	2.4		1	White Flint Metro	1	White Flint Metro						
108	Morgan Run Trail	10.3	Service	Potential	Balt Reg BGP Plan (SCI)	Carroll						12,100	10.9	Yes	0		0							
109	Number 8 Trolley Trail	1.0	Service	Potential	Balt Reg BGP Plan (SCI)	Baltimore						4,744	1.7	Yes	0		0							
110	Norbeck Road Sidepath	0.6	Continuity	Potential	TDG New							2,920	1.3		0		0							
111	Norbeck Road Sidepath	0.5	Continuity	Proposed	Montgomery County MNCPPC	Montgomery						1,631	1.3		0		0							
112	Northeast Baltimore Connector	4.1	Service	Needed	TDG New	Baltimore						16,538	4.9	Yes	0		0		2			Yes		
113	Northwest Branch Trail	1.7	Continuity	Proposed	TDG New	Montgomery						6,662	2.5		0		0							
114	Number Eight Trolley Line Trail and Catonsville Short Line Trail	2.4	Service	Potential	Base TDG, Greenways Atlas, SHA Bike Map	Baltimore						15,705	3.1	Yes	0		0							
115	Ocean City to Crisfield Connector	38.7	Service	Needed	TDG New	Worcester				Yes		3,394	39.5	Yes	0		0							
116	Odenton MARC Station to Ft. Meade	1.0	Continuity	Potential	MDOT Missing Links	Anne Arundel					Yes	2,378	1.7		1	Odenton MTA	1	Odenton MTA	1					
117	Old Gunpowder Road Sidepath	0.4	Continuity	Planned	MDOT Missing Links	Prince George's						1,634	1.2	Yes	0		0		1					
118	Old Town - BSU Connector	0.8	Continuity	Proposed	Old Bowie Plan (TDG)	Prince George's						839	1.6	Yes	1	Bowie State MTA	1	Bowie State MTA	1	Yes		Yes		
119	Old Town Bowie Trail	1.1	Continuity	Proposed	TDG New	Prince George's	Bowie					968	1.8	Yes	0		0		1	Yes		Yes		
120	Owings Mills to Sykesville Connector	5.6	Service	Needed	TDG New	Baltimore and Carroll		Yes				7,666	6.4	Yes	0		0		1					
121	Oxon Run Trail	1.1	Continuity	Potential	Prince George's County	Prince George's			Yes			7,109	1.8		2	Naylor Road Southern Avenue Metro	0							
122	Patapsco Greenway Trail	5.1	Service	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	Howard and Carroll						3,998	5.6	Yes	0		0							
123	Lower Patapsco River Trail	2.0	Continuity	Proposed	MDOT Missing Links	Baltimore and City of Baltimore		Yes				10,415	2.7	Yes	1	Baltimore Highlands MTA	0			Yes		0		

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**Table A.1 Missing Links (continued)**

O ID	Name	Length (miles)	Link Type	Status	Source	County	City	Multijurisdictional within MD (Yes/No)	Is an Interstate Linkage (Yes/No)	Economic Development Potential (Yes/No)	In a BRAC Impact Area (Yes/No)	Population within Half Mile	Population Density in Half-Mile Buffer	Located in Underserved Community	Number of Rail Transit Stations within Half Mile	Station Names	Within One-Half Mile of Rail Station with TOD Slated	Station Names	Number of Barriers Circumvented	Grand History Loop	Great Allegheny Passage	East Coast Greenway	American Discovery Trail	Potomac National Scenic Heritage Trail	
124	Patuxent Greenway Trail	2.1	Service	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	Howard						6,867	2.8	Yes	1	Savage MTA	1	Savage MTA	1						
125	Patuxent Trail Connector	0.3	Continuity	Potential	TDG New	Prince George's						4,206	1.0		0		0		1						
126	Poolesville Connector	6.3	Service	Needed	TDG New	Montgomery			Yes			2,056	7.1		0		0								
127	QUINCE ORCHARD ROAD-NIST PATH	0.9	Continuity	Proposed	City of Gaithersburg (TDG)	Montgomery	Gaithersburg					7,484	1.7		0		0								
128	Randolph Road Sidepath	1.1	Continuity	Proposed	TDG New	Montgomery						6,694	1.9	Yes	0		0								
129	Redland Rd Sidepath	0.4	Continuity	Proposed	Montgomery County MNCPPC	Montgomery						2,748	1.2		1	Shady Grove Metro	0								
130	Rhode Island Avenue Trolley Corridor 2	1.3	Continuity	Potential	MDOT Missing Links	Prince George's						2,747	2.1	Yes	0		0								
131	Rhode Island Avenue Trolley Trail	2.3	Continuity	Planned	Base TDG, Greenways Atlas, SHA Bike Map	Prince George's						15,929	3.5		2	College Park Metro, Riverdale	1	College Park Metro	1						
132	Rhode Island Trolley Corridor 1	1.9	Continuity	Potential	TDG New	Prince George's						6,677	2.7	Yes	0		0		2						
133	Route 29 Corridor (South)	12.7	Service	Needed	TDG New	Howard and Montgomery		Yes				54,318	13.5	Yes	1	Silver Spring Metro	1	Silver Spring Metro	4						
134	Salisbury to Crisfield Connector	21.6	Service	Needed	TDG New	Wicomico and Somerset		Yes	Yes			4,585	22.4	Yes	0		0								
135	Salisbury to Ocean City Connector	21.0	Service	Needed	TDG New	Wicomico and Worcester		Yes	Yes			4,585	21.8	Yes	0		0								
136	Shady Grove Access Road Sidepath	0.9	Continuity	Planned	City of Gaithersburg (TDG)	Montgomery						5,037	1.7		1	Shady Grove Metro	0								
137	Shady Grove Metro Connector	0.3	Continuity	Proposed	City of Gaithersburg (TDG)	Montgomery						3,020	1.1		1	Shady Grove Metro	0								
138	Shady Grove Road Sidepath	2.2	Continuity	Proposed	City of Gaithersburg (TDG)	Montgomery						10,343	3.0		0		0								
139	Solomons Island Connector	4.3	Service	Proposed	TDG New	St Mary's				Yes		2,127	5.0	Yes	0		0		1						
140	South Frederick Connector	4.8	Service	Needed	TDG New	Frederick	City of Frederick					12,287	5.6	Yes	0		0		3						
141	South River Crossing	3.1	Service	Needed	TDG New	Anne Arundel						6,351	3.9	Yes	0		0		1						
142	South Shore Trail (W B & A)	17.3	Service	Planned	Anne Arundel County	Anne Arundel					Yes	22,515	16.9	Yes	0		0		2	Yes		Yes			

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**Table A.1 Missing Links (continued)**

O ID	Name	Length (miles)	Link Type	Status	Source	County	City	Multijurisdictional within MD (Yes/No)	Is an Interstate Linkage (Yes/No)	Economic Development Potential (Yes/No)	In a BRAC Impact Area (Yes/No)	Population within Half Mile	Population Density in Half-Mile Buffer	Located in Underserved Community	Number of Rail Transit Stations within Half Mile	Station Names	Within One-Half Mile of Rail Station with TOD Slated	Station Names	Number of Barriers Circumvented	Grand History Loop	Great Allegheny Passage	East Coast Greenway	American Discovery Trail	Potomac National Scenic Heritage Trail
143	Southern Maryland Connector	23.9	Service	Needed	TDG New	Prince George's					Yes	40,363	24.7	Yes	1	Naylor Road	0		4					
144	Suitland Parkway Trail	6.3	Service	Potential	Prince George's County	Prince George's			Yes		Yes	27,806	7.2	Yes	2	Suitland, Naylor Road	0		1					
145	Swan Harbor Farm Mullins Park Trail	2.3	Service	Potential	TDG New	Harford				Yes	Yes	1,761	2.9	Yes	0		0					Yes		
146	Three Notch Trail	20.8	Service	Planned	Base TDG, Greenways Atlas, SHA Bike Map	St Mary's				Yes		7,686	22.3	Yes	0		0							
147	Three Notch to Indian Head Connector Trail	11.8	Service	Potential	Base TDG, Greenways Atlas, SHA Bike Map	Charles				Yes		3,570	12.5	Yes	0		0		2					Yes
148	Thurmont to Emmitsburg Connector	5.4	Service	Needed	TDG New	Frederick			Yes	Yes		1,756	6.2	Yes	0		0			Yes				
149	U.S. 40 Corridor	37.1	Service	Needed	TDG New	Baltimore and Cecil and Howard		Yes		Yes	Yes	31,148	38.7	Yes	1	Martin St. Airport	1	Martin St. Airport	6			Yes		
150	Van Dusen Sidepath	1.8	Continuity	Proposed	TDG New	Prince George's						9,010	2.9	Yes	0		0							
151	Village of Dorseys Search Trail	0.3	Continuity	Proposed	Base TDG, Greenways Atlas, SHA Bike Map	Howard	Columbia					2,753	1.1		0		0							
152	Virginia Manor Sidepath	0.3	Continuity	Proposed	TDG New	Prince George's						782	1.1	Yes	0		0							
153	W B & A Trail (Patuxent Crossing)	1.4	Continuity	Planned	MDOT Missing Links	Anne Arundel					Yes	1,706	2.1		0		0		1	Yes		Yes		
154	Walker Branch Trail	0.9	Continuity	Potential	TDG New	Prince George's						7,458	1.0		0		1							
155	Walkersville Connector	2.0	Service	Needed	TDG New	Frederick						4,836	1.7	Yes	0		0		1					
156	West Cambridge Trail	2.0	Service	Planned	TSIP Public Input	Dorchester						3,884	2.8	Yes	0		0							
157	Western Branch Trail	1.6	Continuity	Proposed	Prince George's County	Prince George's						4,794	2.7	Yes	0		0							
158	Wheaton Regional Park Connector	0.6	Continuity	Proposed	TDG New	Montgomery						5,054	2.6	Yes	0		0							
159	White Marsh Run Trail	6.1	Service	Planned	Base TDG, Greenways Atlas, SHA Bike Map; East Baltimore County PBA Plan	Baltimore					Yes	15,925	1.3		0		0		3			Yes		
160	H&F Trolley Trail	13.9	Service	Proposed	Frederick County	Frederick	City of Frederick			Yes	Yes		6.6	Yes	0		0			Yes				
161	MD 355 Sidepath (North)	1.0	Continuity	Proposed	Montgomery County MNCPPC	Montgomery						5,795	1.7		0		0							

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