

SECTION IV
ENVIRONMENTAL CONSEQUENCES

ENVIRONMENTAL CONSEQUENCES

The following provides a discussion on impacts to environmental resources resulting from implementation of the SHA Selected Alternate. Details on impacts associated with all the Alternates Retained for Detailed Study can be found in the **Draft Environmental Impact Statement/Section 4(f) Evaluation MD 3 Project Planning Study** (DEIS, March 2004).

A. SOCIO-ECONOMIC EFFECTS

This assessment of project effects shows that communities in the study area would experience both benefits and impacts resulting from the construction of the SHA Selected Alternate. The No-Build Alternate would not address the human environment associated with continued and increased congestion, and would not address the needed improvements. Some of the effects resulting from the construction phase of the SHA Selected Alternate include:

- Temporary access and traffic detours during the construction phase for some communities and businesses,
- Displacements of single-family homes and businesses along the corridor,
- Changes in access point locations,
- Improvements to bicycle and pedestrian access and safety, and
- Improvements to the safety and operation of MD 3.

No anticipated permanent adverse impacts to population, community cohesion, land use, economic conditions, or public services would occur as a result of the SHA Selected Alternate. The residential communities in the study area have developed around the existing roadway and the proposed roadway improvements would not directly impact these communities, except for 10 individual residential properties that will be displaced. Because the nature of the project is to modify the existing roadway, the project would not cause a fundamental change in the character of the area.

1. Social Effects

This section presents information on how project alternates would affect people, their residences, businesses, neighborhoods, communities, walking and biking opportunities, local aesthetics, and community facilities and services.

a. Displacement and Property Effects

Based on the current level of engineering design performed for this study, the following summarizes the potential displacements associated with the SHA Selected Alternate. For comparison purposes it is noted that the general maintenance and minor improvements associated with the No-Build Alternate would have no displacements of residences or businesses and would occur within existing SHA right-of-way. Conversely, the SHA Selected Alternate

would displace 10 residences and 15 businesses; these are a result of grading impacts associated with proposed roadway widening and interchange options. In addition to the need to acquire entire parcels, it would be necessary to also acquire additional strips of right-of-way immediately adjacent to the existing roadway.

Potential residential displacements are anticipated in the northern portion of the corridor with two occurring along northbound MD 3 between Carver Road and Brickhead Road/Wellfleet Road and eight occurring between St. Stevens Church Road and MD 32. Potential business displacements are anticipated throughout the corridor with one between US 50 and Sylvan Drive, three between Sylvan Drive and the Patuxent River, three between Clubhouse Gate Drive and Carver Road, three between Brickhead Road/Wellfleet Road and St. Stevens Church Road, and five between St. Stevens Church Road and MD 32. **Table VI-1** below provides a breakdown of anticipated displacements and associated right-of-way impacts by segment. Graphics showing the location of property acquisition requirements for both displacements and right-of-way can be found in **Appendix F**.

Table IV-1
SHA Selected Alternate: Residential/Business Displacements & Right-of-Way Acquisition

		a-a	b-b	c-c	d-d	e-e	f-f	g-g	Totals
		US 50 to Sylvan Drive	Sylvan Drive to Patuxent River	Patuxent River to South of Clubhouse Gate	South of Clubhouse Gate to Carver Road	Carver Road to Brickhead/Wellfleet Road	Brickhead/Wellfleet Road to St.Stevens Church Road	St. Stevens Church Road to MD 32	
SHA Selected Alternate	Residential	0	0	0	0	2	0	8	10
	Business	1	3	0	3	0	3	5	15
	Right-of-Way (acres)	5.9	46.7	13.0	30.8	8.3	11.0	24.0	139.7

Title VI Statement

“It is the policy of the Maryland State Highway Administration to ensure compliance with the provisions of Title VI of the Civil Rights Act of 1964 and related civil rights laws and regulations which prohibit discrimination on the grounds of race, color, sex, national origin, age, religion, or mental disability or sexual orientation in all State Highway Administration projects funded in whole or in part by the Federal Highway Administration. Title VI Statement requires federal agencies to ensure that their programs, policies, and activities do not have the effect of excluding populations from the benefit of, or subject persons and populations to discrimination based on race, color, or origin. The State Highway Administration will not discriminate in highway planning, design, or construction, the acquisition of right-of-way, or the provision of relocation advisory assistance. This policy has been incorporated into all levels of the highway planning process to ensure that proper consideration may be given to the social, economic, and environmental effects of all highway projects. Alleged discriminatory actions should be addressed to the Equal Opportunity Section of the SHA for investigation.”

b. Relocation Process

Relocation of any individuals, families, or businesses displaced would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 as amended by Title IV of the Surface Transportation Policies Act of 1987, and would be executed in a timely and humane fashion (refer to **Appendix D - Relocation Assistance Program**). During the relocation process, SHA will make every effort to keep businesses and residences within a close proximity to the existing site, and will work to ensure the new structure and facilities maintain the operational and/or living standards established by the original location. In the event comparable replacement housing is not available for displaced persons, or available replacement housing is beyond their financial means, replacement “housing as a last resort” will be utilized to accomplish relocations.

c. Environmental Justice

As described in **Chapter III – Affected Environment**, no census tract-block group within the study area contains a minority population at a percentage that exceeds the minority population for its county as a whole or the U.S. Environmental Protection Agency Interagency Working Group on Environmental Justice criteria of 50 percent minority or low-income (EPA, 1998). Therefore there is no potential for disproportionate high and adverse effects. Although there are no minority or low-income populations in the study area that exceeds Federal standards for Environmental Justice, SHA will continue its commitment to providing full and fair access to all communities by:

- Ensuring that the membership of its focus group was representative of each community potentially affected by the project,
- Providing project information via numerous radio stations, publications, and mailings, as detailed in **Section A – Public Involvement Summary** of this chapter, and
- Continuing coordination to all areas where displacements could occur to encourage residents to contact SHA with their concerns about the project.

d. Effects on Neighborhoods and Communities

MD 3 is a well-established transportation route that greatly influenced the development and growth of the neighborhoods and communities in the study area. Representatives from the neighborhoods and communities have played an important role in the development of the SHA Selected Alternate. The local neighborhoods and communities would benefit from a number of improvements proposed as part of the SHA Selected Alternate. The following are a few benefits:

- Enhanced safety provided by grade separated interchanges at intersections and auxiliary lanes for access point turning movements,
- Introduction of corridor wide pedestrian and bicycle access and connectivity,
- Improved visual quality from uniform corridor landscape themes, and
- Reduction in congestion and improved travel times from roadway and intersection improvements.

Community Cohesion, Access, and Mobility

The SHA Selected Alternate would not affect community cohesion because the proposed road configurations would not separate or divide communities. MD 3 has existed in the same location for many years and its presence influenced the layout and design of nearly all of the residential areas. The mainline elements of the SHA Selected Alternate remain within the existing corridor. Although the SHA Selected Alternate would result in minor changes in access, it would not isolate or separate residential areas. Similarly, the proposed interchanges would alter access routes, but none would separate or isolate communities.

In the northern median areas in Gambrills/Millersville and southern median near Bowie, where communities were divided by past MD 3 construction projects, the SHA Selected Alternate would reduce the access barrier that high volumes of MD 3 traffic imposes. The easing of congestion and improved accessibility supplied by the proposed auxiliary lanes would help provide greater mobility to and from the median properties. In addition, the proposed grade separated interchanges would provide greater ease crossing MD 3 for both motor vehicles and pedestrians.

During construction most work would be limited to existing MD 3, therefore the potential temporary effect on community cohesion would be minimal. Community cohesion effects would be considered in developing maintenance of traffic plans and any necessary detour routes.

Although the No-Build Alternate would not change any access routes in the study area, future traffic and congestion increases would hamper mobility in the study area. The SHA Selected Alternate would improve access, mobility, and safety for drivers in the MD 3 study area who travel to work, shopping, school, and recreational destinations. Access to all properties in the project area would be maintained, although routes may be different.

Changes would occur when existing driveway and street access points are relocated to a service road, e.g., a road that is roughly parallel, but separate to the main road. Drivers would access MD 3 at selected points. This would result in minor changes to traffic circulation and could cause minor increases in the length of the route. However, these changes would increase the safety of entering and exiting MD 3.

In addition, the SHA Selected Alternate would limit east-west access from MD 3 to specific points. With the introduction of the proposed grade separated interchanges, drivers traveling in one direction on MD 3 would be able to access the opposite direction only through a series of turns. In most cases, these turns result in a slightly longer, but safer, route for drivers to reach their destination.

Under the SHA Selected Alternate, the following access changes would occur:

- From Belair Drive to MD 450, residents and businesses on the west side of existing northbound MD 3, including properties in the median, would be required to access their properties from a two-lane, two-direction service road that would be located where southbound MD 3 exists today. No direct access to MD 3 for individual properties would

be accommodated. This could result in routes to/from these locations that are up to one mile longer than under the No-Build Alternate.

- From MD 175 to Saint Stephens Church Road, driveway access to southbound MD 3 for properties in the median would be minimized or eliminated where possible. This change in access could result in routes to/from these locations that are longer than the No-Build Alternate.

Intersection modifications associated with the SHA Selected Alternate would also result in changes in traffic patterns, but movements in all directions would be maintained as would access to all properties. The intersection modifications would not result in any changes to access to individual properties.

During project development, the MD 3 communities requested increased opportunities for walking and bicycling. The SHA Selected Alternate includes formalized sidewalks and bicycle facilities. The SHA Selected Alternate would provide safe pedestrian crossings at each major intersection that would enhance community mobility, particularly in areas like Crofton where community facilities, such as the post office, are located on the west side of MD 3, opposite the community they serve on the east side. The general concept for these facilities would be developed in detail during later stages of project design. Sidewalks and bicycle paths would improve communities' connectivity among the various areas of the study area. This connectivity would allow residents to safely walk or bicycle to shopping, parks, and other communities.

Effects on Traffic Operations

The SHA Selected Alternate would provide enhanced traffic operations and safety enhancements that address the concerns of the public, local elected officials, and state and federal agencies while minimizing impacts to environmental, cultural, and community features. Level-of-Service function and travel delay at intersections are improved to the extent possible through additional capacity and reconfiguration of existing roadway features. Grade separated interchanges, auxiliary lanes, and access consolidation are incorporated to improve operations and reduce accidents. And because there are no changes proposed that would prohibit or severely restrict access, no impacts are anticipated to occur on secondary streets as a result of the proposed improvements. For more detail on the traffic operations refer back to the **Section I – Traffic and Safety Enhancements** discussion on page II-26 of **Chapter II – Alternates Considered** of this document.

e. Effects on Visual and Aesthetic Resources

As described in **Chapter III - Affected Environment**, the MD 3 roadway dominates the overall visual character of the right-of-way. Street trees, planted medians, sidewalks, bicycle paths, streetscaping, landscaping, and other urban design elements would improve the overall appearance of MD 3 under the SHA Selected Alternate. SHA has been working with the MD 3 focus group to obtain input for the design themes for these improvements to ensure that the ultimate appearance of the road reflects the values and character of the community. In addition, SHA has solicited input concerning roadway aesthetics at the Alternates Public Workshop and

the Location/Design Public Hearing. The design enhancements will result in improved visual quality in the study area.

The SHA Selected Alternate would particularly improve the view of Bowie residents on the west side of MD 3 because a new local street with decreased traffic volumes would serve the residents adjacent to MD 3, including median residents. The remainder of the corridor would also include design themes.

In close proximity to the grade-separated interchanges proposed at the major intersections, residents and business owners/patron's view of the road would be dominated by highway structures that could be as high as 24 feet over the centerline of the existing roadway. The negative effect of this change in view would be minimized by implementing the context-sensitive design strategies identified during the Focus Group activities (i.e., use of native vegetation in landscaping, cohesive hardscape treatments, visual buffers of highway and interchanges, connective sidewalks and hiker/biker trails, decorative treatments for proposed structures, and other strategies to be determined during design and construction phases) that will be carried forward during the detailed design stages for the SHA Selected Alternate.

A corridor wide analysis of impacts to visual and aesthetic resources is presented in **Section G – Visual and Aesthetic Quality**.

f. Effects to Community Facilities and Services

Under the No-Build Alternate increasing traffic congestion would decrease mobility and safety throughout the study area, which would adversely influence access to community facilities and provision of services.

Overall, residents and patrons of the community facilities and services, including emergency response services, in the study area would benefit from the increased mobility and safety that would result from the SHA Selected Alternate. As previously described, residents of certain areas would experience minor changes in routes into and out of their neighborhoods. Users of community facilities located in these areas would also be subject to these changes, as described in the following sections.

Table IV-2 lists the community facilities located within the study area, which will be affected by the SHA Selected Alternate.

**Table IV-2
Affected Community Facilities and Services**

Community Facilities and Services	Area
Educational Facilities	
Crofton Middle School	North Crofton
Crofton Elementary School	Crofton Triangle
Religious Institutions or Facilities	
Ministry of the Word	North Crofton
Wilson Memorial United Methodist Church	North Crofton
Latter Day Saints Church	Eastern Bowie
Park and Recreational Facilities	
Patuxent River Park	West Crofton/Eastern Bowie
White Marsh Park	Eastern Bowie
Recreational Facilities	
Washington Baltimore and Annapolis Trail	Gambrills
Capitol Raceway	West Crofton
Crofton Bowie Roller Rink	West Crofton
Emergency Services	
Waugh Chapel Fire Station	North Crofton

Educational Facilities

The SHA Selected Alternate would not require property acquisition from any educational facilities. Under the SHA Selected Alternate, the project would be designed to standards that safely accommodate school buses. Changes in traffic circulation, particularly near the intersections, could also require minor adjustment of school bus routes. During construction, these routes may also be temporarily affected. Crofton Elementary and Middle Schools would be most affected by potential delays during construction and new traffic configurations associated with the SHA Selected Alternate after construction. During development of detour routes, SHA would coordinate with the school systems to ensure that safe and efficient bus routes for these schools would be maintained throughout construction. There would be no effect on the Crofton Annex, which the Anne Arundel County Department of Schools uses as a training facility.

Religious Institutions or Facilities

The SHA Selected Alternate would require the acquisition of approximately 0.76 acre of land from the Ministry of the Word, approximately 0.07 acre from the Wilson Memorial United Methodist Church, and approximately 0.06 acre from the Jesus Christ Church of the Latter Day Saints to accommodate a reconfigured MD 3. These acquisitions, shown in **Figure SA-12 of Appendix F – SHA Selected Alternate and ARDS Mapping**, are at the edges of the properties and should not affect the uses of the church facilities.

As previously described, access in certain areas would change. In North Crofton, the Ministry of the Word and Wilson Memorial United Methodist Churches currently has direct access to and from MD 3. As part of the SHA Selected Alternate, members of these churches would be able to use an auxiliary lane to make turning movements in to and out of parking areas. With the auxiliary lanes, drivers would benefit from the increased safety of having their turning movements occur in a separated lane away from through traffic conflicts.

In Bowie, the SHA Selected Alternate would reconfigure access to Sylvan Drive near the Church of Jesus Christ of Latter Day Saints. Members of this church would access the facility via the proposed service road, which, just as with Wilson Memorial, would provide a safer route, separated from through traffic, than the current configuration.

SHA will coordinate with these institutions to ensure that members have safe access to their facility during the construction phase.

Park and Recreational Facilities

The SHA Selected Alternate would have no affect on access to Patuxent River Park, while the proposed dualization of MD 3 in Prince George's County would modify the current direct access from MD 3 to White Marsh Park. However, no temporary or permanent right-of-way will be needed from either park property to complete the work, and access will be maintained at both locations during construction of the SHA Selected Alternate.

At this time there is one gravel-paved access point connecting Patuxent River Park directly to southbound MD 3. During the proposed widening and addition of curb and gutter on MD 3, minor grading and standard tie-in impacts to the park access point would occur within existing SHA right-of-way. The access point into Patuxent River Park would remain open to traffic during construction of the mainline improvements. Although Anne Arundel County had requested that SHA look at opportunities to ultimately relocate the park access to Conway Road, the construction and relocation of the park access will be done by Anne Arundel County as part of a separate park enhancement effort.

In the Prince George's portion of the study, the proposed dualization of MD 3 would modify the travel routes used to access the White Marsh Branch Recreational Area. Currently, visitors have direct access to the park from southbound MD 3. The SHA Selected Alternate will maintain this park entrance but will convert existing southbound MD 3 into a two direction service road. Visitors to the park would use either Forest Drive or MD 450 to reach the service road and the park entrance. Using MD 450 would add approximately 1.8 miles of travel for the park visitors compared to the current direct access configuration.

Emergency Services

There are no hospitals with emergency rooms located within the study area that would be directly affected by changes in roadway configuration or access routes. Company 5: Waugh Chapel Fire Station at Waugh Chapel Road would experience changes in access routes under the SHA Selected Alternate. Emergency service providers in the study area were contacted and

information was requested on the potential effect of the alternates on response time for fire and rescue services. Copies of these letters are included in **Chapter V - Comments and Coordination, Section C – Local Agencies Coordination** of this document. The results of this coordination indicate that emergency response providers are generally in favor of any proposed actions to alleviate congestion through the study area. The SHA Selected Alternate would provide more efficient traffic operation along MD 3, which would assist to improve response times in general.

Prior to the beginning of the construction phase, SHA will continue its coordination with emergency service providers to advise them of potential traffic delays during construction and to provide maps of the detour routes as a measure to minimize response times.

Transportation Facilities

Washington Metropolitan Area Transit Authority (WMATA) uses portions of MD 3 for its Bus Route 29 that serves Crofton and Bowie, and Bus Route 31, that serves only Bowie. Bus Route 29 makes stops at 1501 Crofton Parkway, Crofton Country Club and Park and Ride, Gateway Center, and the Bowie Park and Ride. Bus Route 31 makes stops at Gateway Center, the Bowie Park and Ride, and New Carrollton Metro Station. These routes provide express service from these Crofton and Bowie areas to the New Carrollton Metro Station. Under the SHA Selected Alternate, riders would benefit from improved mobility and safety along MD 3. As the routes do not include stops on MD 3, implementation of the SHA Selected Alternate would not necessitate changes in stop locations. WMATA's Central Avenue route, Bus Route 31, terminates at the Bowie Marketplace shopping center. SHA will coordinate with WMATA to ensure continuation of transit service in the corridor during construction.

2. Economic Effects

a. Countywide Effects

As presented in **Chapter III – Affected Environment**, the majority of the study area residents are employed in areas outside the study area. The No-Build Alternate would negatively affect the study area's employment travel patterns because higher forecasted traffic volumes resulting in future increases in operational delays on MD 3 would increase commuting time to places of employment. The resulting decreased mobility would not support regional economic growth and could encourage economic development to occur elsewhere. Conversely, the SHA Selected Alternate would improve operations and minimize delay along MD 3, thereby supporting the existing and already planned economic growth in the study area.

b. Local Effects

Business Effects

Transportation benefits associated with the SHA Selected Alternate include reduced travel time for motorists, thereby increasing mobility within the region. Increased mobility has the potential to attract more employees and employers to the area.

As shown in **Table IV-1**, the SHA Selected Alternate would displace 15 businesses. The types of businesses displaced include gasoline stations, restaurants, convenience stores, and small specialty shops, including antique shops and a farmer's market. Each displaced business currently provides services to the community and pays local taxes. Many of the business displacements are associated with large national chains and have a customer base associated with the company's national reputation, while others are unique to the study area. The SHA has programs to assist in relocating businesses and SHA Office of Real Estate staff will work with businesses to identify suitable relocation sites according to the needs of each business should they choose to relocate. As part of the relocation process, every attempt will be made to relocate businesses within the corridor and maintain the operational, access, and visibility standards established by the original site. Compensation to owners, as appropriate under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, would be provided by SHA. Information concerning the Maryland Relocation Assistance Program is included in **Appendix D**.

The SHA Selected Alternate would affect business operations to some degree. Roadway dualization, grade-separated intersections, and landscaped roadways would reduce the visibility of businesses to the motoring public. Some businesses, particularly those in the median, would experience changes in access and a loss of roadway visibility, which could result in a reduced inclination for traveling customers to stop, resulting in negative economic effects to existing businesses. SHA would work with individual business owners to ensure the road is as complementary as possible to local businesses. The positive effects of construction of the SHA Selected Alternate are that the proposed auxiliary lane would provide safer movements in and out of properties that now have direct access to MD 3. Businesses that depend on convenient and safe access for their customers, such as retail, restaurants, and services would benefit from the safer customer access and convenience.

During construction, businesses would experience changes in access, exposure to dust and noise, and a decrease in visibility that could lead to a decrease in customers. The SHA would work with each property owner to develop a construction plan that maintains access to the property throughout the construction period. Although it is too early to determine the timeline for the construction of the proposed roadway improvements, similar projects have taken up to four years to complete.

Tax Base

The SHA Selected Alternate would require property acquisition, resulting in permanent loss of land from the tax base. Both Anne Arundel County and Prince George's County assess property taxes based on market value. In the short-term, acquisition of these lands would result in a decrease in property tax revenues. This reduction in tax revenues is small relative to the total tax base of the counties.

The SHA would assist these businesses in relocation and reestablishment if the owners choose to relocate. Should the business owners choose to relocate elsewhere or not relocate at all; there would be a minor loss of tax revenue for the State of Maryland.

Over the long term, this short-term loss of tax revenue should be more than offset by the increases in the value of property along MD 3 resulting from improvements in safety, access, and aesthetics.

3. Land Use Impacts

a. Existing and Future Land Use

The SHA Selected Alternate would cause changes in land use from business and residential land to permanent transportation uses. The SHA Selected Alternate is contained primarily within the existing MD 3 right-of-way; therefore these changes in land uses would have an insignificant effect on the overall pattern of development in the study area. No new access would be provided to previously inaccessible properties that would encourage development of open space areas.

The No-Build Alternate is inconsistent with the comprehensive plans for the study area, all of which include assumptions that MD 3 would be improved. Elements of the SHA Selected Alternate are consistent with various aspects of the master plans.

All master plans call for limiting access points to MD 3, improving the road through streetscape and urban design, and for providing new pedestrian and bicycle facilities. The SHA Selected Alternate is consistent with these concepts.

The small area plans for Anne Arundel County include the Odenton Small Area Plan, which includes the Gambrills area, and the Crofton Small Area Plan, which includes the North Crofton area, Crofton Triangle, and Priest Bridge areas of the study area. These plans identify the base widening concept (boulevard concept) approved by the earlier MD 3 Task force as the accepted concept for the road. The Crownsville Plan, which includes the Millersville area, makes no remark on the character of MD 3, other than to note future limits to strip development that are important to preserving the area's rural character.

The Crofton Small Area Plan calls for expansion of commercial development in the area of Cronson Boulevard. The SHA Selected Alternate does not preclude expansion of commercial areas.

The Bowie Master Plan includes the Eastern Bowie, Sherwood Manor, and Bowie portions of the study area. The Bowie Master Plan identifies upgrading MD 3 to freeway standards with a series of interchanges. The Plan also notes that an alternative to this concept would be to separate local traffic from through traffic, including construction of a local access road. The SHA Selected Alternate generally reflects this concept. Interchange options would also eliminate traffic signals and ease delays because of the grade separations. In addition, The Bowie Master Plan calls for acquiring properties in the median for safety reasons and to protect perennial streams. The mainline concepts would require acquisition of property in the median of MD 3; however, none would totally remove all median development to accommodate roadway modifications. The SHA Selected Alternate would not preclude local government from undertaking such acquisitions in the future.

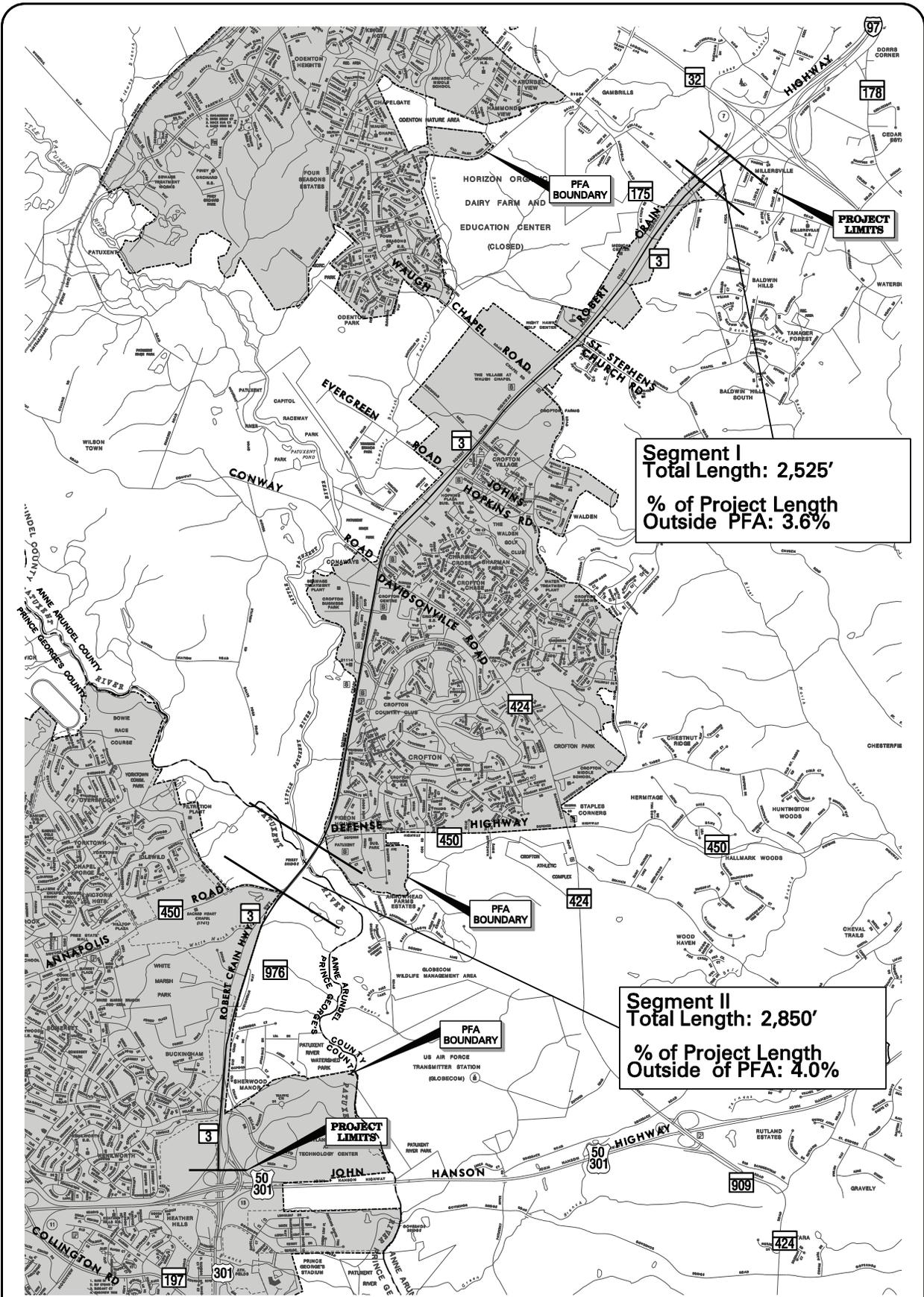
b. Compliance with Smart Growth Initiatives

As stated previously in **Chapter III – Affected Environment**, the Maryland Department of Planning (MDP) concurred on July 23, 2009 that the project is considered in compliance with the requirements of the COMAR 11.04.13 – Smart Growth and the project is considered to be located inside Priority Funding Areas. A copy of the concurrence letter can be found on page **V-A-98** in the **Chapter V - Comments and Coordination** section of this document.

The concurrence letter states that SHA may consider this transportation project to be located within a PFA. **Figure IV-1** depicts the PFA as it relates to the MD 3 project. The COMAR 11.04.13 – Smart Growth regulations state that even if segments of the project are physically located outside of the PFA if (1) each segment satisfies one of five given conditions and (2) the total lane mileage of the segments located outside of the PFA does not exceed 20 percent of the total lane mileage of the project.

SHA and MDP determined that the project is within a PFA based on compliance with the five conditions set forth below:

- The segments of MD 3 serve as a boundary of a priority funding area, and all portions of MD 3 immediately adjacent to the priority funding area, such as ramps, bridges, and overpasses, are deemed to be the priority funding area for purposes of State Finance and Procurement,
- The individual segment(s) falling outside the PFA comprise less than five percent of the lane mileage of the total project (3.6 percent and 4 percent - **see Table IV-3**),
- MD 3 traffic operations and safety would not benefit from any expansion of transit services, however other Transportation System Management and Transportation Demand Management measures have been incorporated,
- The portion of the total project located outside of the PFA equals less than 20 percent of the total lane mileage of the project (7.6 percent outside of the PFA - **see Table IV-3**), and
- Since 64 percent of traffic traveled between two PFAs in a MDP 2007 traffic study, MD 3 would be exempt under State Finance and Procurement Article 5-7B-06, Annotated Code of Maryland because it connects PFA boundaries using adequate access controls that would prevent development as defined by the Board of Public Works.



MD MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 3 PROJECT PLANNING STUDY
Final Environmental Impact Statement

PRIORITY FUNDING AREAS

SCALE	As Shown	FIGURE	IV-1
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**Table IV-3
MD 3 Segments and Linear Relationship to PFAs**

Segment Name	Inside PFA (linear feet)	Inside PFA (%)	Outside PFA (linear feet)	Outside PFA (percent of project length)	Segment Length (linear feet)
I	0	0	2,525 (0.48 miles)	3.6	2,525
II	0	0	2,850 (0.54 miles)	4.0	2,850
Project Length	65,375 (12.4 miles)	92.4	5,375 (1.02 miles)	7.6	70,750 (13.4 miles)

Within Segment I, located at the northern limit of the project area, the areas outside the PFA boundaries are north and west of MD 175 near the interchange area connecting MD 3 with I-97 and MD 32. The distance outside the PFAs is 2,525 feet or approximately 0.48 mile. One proposed improvement in this segment would create a transition from four lanes through MD 175 back to the existing two-lane roadway, while a second improvement would realign Charles Hall Road to remove direct access from MD 3. Segment I accounts for 3.6 percent of the project lane miles, it will remain access controlled near the MD 32 interchange, and it will reduce from eight to five the number of direct access points to MD 3. Furthermore, the SHA Selected Alternate does not increase capacity in Segment I.

Within Segment II, located at the MD 3 crossing of the Patuxent River and the respective county boundaries, the distance outside the PFAs is 2,850 feet, approximately 0.54 mile or 4.0 percent of the project lane miles. The undevelopable 100-year floodplain for the Patuxent River is outside the PFA in this location. The SHA Selected Alternate includes a fully access controlled MD 450 Interchange that would prohibit any future access to MD 3 outside the PFAs. In addition, the MD 450 Interchange would address operational and safety needs through a direct connection of MD 450. Furthermore, existing access points to Patuxent River Road, Jaspers Restaurant, and W.F. Chesley Center would be consolidated as part of the interchange improvements. Due to grading, structures, and the access controlled nature of the interchange, no new development opportunities would be practical once this interchange is constructed. There are also no site development proposals under consideration for this location at this time. Therefore, SHA has determined that the MD 3 project meets and satisfies the COMAR requirements for Linear Features and should be considered to be consistent with the Priority Funding Areas Act.

4. Public Involvement Summary

As identified in **Chapter III – Affected Environment**, SHA has conducted various outreach activities to obtain feedback from residents of the study area. Activities included:

- The formation of a focus group,
- Community group and business association meetings,

- Property owner and resident survey, project updates on SHA's website: www.marylandroads.com/WebProjectLifeCycle/countyProjects.asp),
- The circulation of newsletters, and
- The presentation of conceptual alternates at the MD 3 Alternates Public Workshop and the Location/Design Public Hearing.

Working with the MD 3 Focus Group, several members identified issues related to the MD 3 project. The following is a summary of several issues raised and strategies incorporated to address them as part of the SHA Selected Alternate:

- Property owner rights – The focus group members voiced concern about the property valuation process for landowners potentially displaced by the SHA Selected Alternate. SHA provided information on how it will comply with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970, and other applicable regulations. SHA will continue to inform and assist landowners for the duration of the project.
- Fair compensation to businesses for loss of access – SHA addressed the general concern regarding loss of access in its design of the SHA Selected Alternate. As a result, no business not displaced by the SHA Selected Alternate will lose access to MD 3, although multiple existing access points to businesses may be consolidated. SHA is committed to working with business owners during project design and construction.
- Safety at the intersection of MD 3 and Patuxent River Road – Currently, poor sight distance exists at the intersection. As a result of focus group members identifying this concern, SHA's District 5 Engineers have developed and implemented a short-term solution consisting of modified lane markings, wider shoulders, and traffic control signs to slow traffic through this area. The Selected Alternative includes a complete reconstruction of this intersection.
- Traffic speed and speed enforcement – Focus group members requested consideration of strategies to slow traffic in the project area. SHA is committed to investigating further strategies that would enhance driver awareness of posted speeds, such as pavement color, aesthetic treatments, and appropriate signage, during the design phase.
- Noise impacts to communities – A noise impact analysis was performed using standard FHWA and SHA methodologies. It was found that with the SHA Selected Alternate, noise levels would increase beyond No-Build conditions. As described later in **Section F – Noise**, mitigation was evaluated as part of this study and all reasonable and feasible mitigation will be done in impacted areas.
- Pedestrian crossings on MD 3 – Concerns regarding safety raised by focus group members were addressed by including pedestrian crossings on MD 3 at each main intersection in the SHA Selected Alternate.
- Weigh stations on MD 3 for truck traffic – A weigh station was suggested as a strategy to discourage truck traffic on MD 3 through the study area. SHA analyzed whether this would be effective and it was found that 78 percent of truck traffic through the project study area is local traffic; therefore a weigh station would not appreciably reduce truck traffic in the study area.

The focus group effort continued throughout the duration of the project planning study. Meeting minutes for the focus group meetings are included in **Chapter V – Comments and Coordination, Section B – Public Involvement Coordination**.

In early 2002, SHA conducted a study area survey and distributed 5,200 questionnaires as part of the initial MD 3 newsletter. SHA received 426 responses (8 percent), which is comparable to responses SHA has received on similar surveys. Responses to the survey were broken down by location in the study area, and consolidated into the four larger areas of Crofton, Gambrills, Millersville, and Bowie. Each of the items identified through the public comments received from the survey have been incorporated into the Build Alternates for the project.

An Alternates Public Workshop was held on November 7, 2002 at the Waugh Chapel Village Community Center, in Gambrills, MD. The purpose of the workshop was to familiarize the public with the MD 3 Project Planning Study. The workshop presented a summary of conceptual engineering and environmental studies to date, and provided an opportunity for public input to the Project Planning Process. The Alternates Recommended for Detailed Study have been carried forward based upon the comments received at the workshop.

A Location/Design Public Hearing was held on May 20, 2004 at the Crofton Middle School in Crofton, MD. The purpose of the workshop/hearing was to present the Alternates Retained for Detailed Study and impacts and benefits of each alternate. Input from the Location/Design Public Hearing was used to help identify the SHA Selected Alternate. Because no major changes have been made to the SHA Selected Alternate, no additional formal public meetings have been held. There have been several other informal meetings with community groups, property owners, and concerned citizens since the May 2004 Location/Design Public Hearing. Details on these meetings are available in **Chapter V - Comments and Coordination**.

B. CULTURAL RESOURCES

The requirements of the National Historic Preservation Act (NHPA) of 1966, as described in 36 CFR Part 800, establish the procedures for compliance with Section 106 of the NHPA. Once an agency has identified historic properties, it must determine whether the proposed activity will impact the resources in anyway. The agency consults with the State Historic Preservation Officer (SHPO) to determine this and takes into account the views of any interested parties. The SHPO's determination of effects on cultural resources is documented in their letters dated March 8, 2004 (**see V-A-14**), June 1, 2009 (**see V-A-89**), and March 30, 2010 (**see V-A-103**).

The agency applies the criteria of effect to determine if an undertaking would affect characteristics qualifying the property for inclusion in the National Register of Historic Places (NRHP), and submits its findings to the SHPO for concurrence.

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association [36 CFR 800.5(a)(1)].

Additional protection from impacting or transferring significant cultural resources into transportation uses are afforded under Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S. C. 303 (c)). This Act permits the use of publicly owned land from any public park or recreation area, wildlife or waterfowl refuge, or historic site (as determined by the officials having jurisdiction over the park, recreation area, refuge, or site) only if there is no prudent or feasible alternative to the use of such land, and all possible planning has been undertaken to minimize harm to such park, recreation area, wildlife or waterfowl refuge, or significant historic sites resulting from this use.

Since the publication of the 2004 DEIS, the SHA Selected Alternate has been modified to avoid impacting any historic sites and public parks.

1. Historic Standing Structure – Sacred Heart Roman Catholic Church

For the SHA Selected Alternate, a service road or access ramp to MD 3 would be constructed across the current property boundary of the Sacred Heart Roman Catholic Church property at the MD 3 and MD 450 west intersection. The historic boundary for the NRHP eligible Sacred Heart Roman Catholic Church differs from the property boundary and is located on a hilltop within this larger church owned property. Ample visual and audible buffers (500 feet of dense forest) and approximately 1,700 feet of distance exist between the proposed construction and the historical buildings. Through coordination with Maryland Historical Trust (MHT), it was determined that the SHA Selected Alternate would have no adverse impacts on the Sacred Heart Roman Catholic Church (March 8, 2004). Section 4(f) does not apply since the transportation project does not require right-of-way within the NRHP eligible boundary of the Sacred Heart Roman Catholic Church. The buffering provided by the topography, distance from MD 3, and the dense forest prevent any constructive use of the historic resource.

2. Archeological Sites

a. Warfield Site (18PR33) – NRHP Archeological Site

The Warfield Site (18PR33) straddles the MD 3 median and extends west of the current roadway. Impacts to the site can be mitigated by data recovery as detailed in the Memorandum of Agreement (MOA) which can be found on page **V-A-103** of **Chapter V – Comments and Coordination** of this document. Section 4(f) does not apply since the site does not warrant preservation in place.

b. Oak Grove site (18AN503) – Potential NRHP Archeological Site

The SHA Selected Alternate impacts the margin of the former Oak Grove (18AN503) plantation; this area is not eligible for the NRHP, and is therefore not considered a Section 4(f) resource. However, investigation and coordination with the MHT is required should the limits of disturbance (LOD) shift to impact the remaining portions of the Oak Grove site.

Impacts from the SHA Selected Alternate are shown in **Table IV-4**.

**Table IV-4
Impacts on Historic Structures**

Resource	Type	SHPO Opinion (3/8/10)	Alternate 3	
			Impact	SHPO Concur
Sacred Heart Chapel PG:71A-19	Structure	Eligible	No Adverse	3/8/04 & 7/25/06
Warfield site 18PR33	Archeological	Eligible	Adverse	Adverse, but no preservation in place 7/25/06**
Oak Grove 18AN503	Archeological	Not determined for entire site, but portion in APE is not significant*	No Impact	3/8/04 & 7/25/06

Key: * = MOA if the design shifts outside current LOD ** = MOA for data recovery

3. Potential Wetlands/Water Resources Mitigation Sites

a. T. Howard Duckett (Rocky Gorge) Dam – Potential Historic Standing Structure

As part of the proposed conceptual mitigation for the SHA Selected Alternate, an eel passageway was suggested by the USFWS staff for the T. Howard Duckett (Rocky Gorge) Dam. Plans were not developed before the conceptual mitigation was removed from the streamlined process coordination efforts for this project, thus consultation with the MHT was not concluded; its completion has been stipulated during final design in the existing MOA.

If the T. Howard Duckett dam is found to be eligible for the NRHP, the Section 4(f) impacts to this structure from the non-permanent attachment of a metal eel passage ladder would need to be resolved. SHA would likely request FHWA's concurrence in either a De Minimis impact or that the temporary use of the T. Howard Duckett dam is not subject to the requirements of Section 4(f). This coordination would be included in a future Environmental Reevaluation during the design phase of the project.

b. White's Landing (PR-387) and Kettering Community Park (PR-374) – Potential Archeological Sites

White's Landing (PR-387), within the Patuxent River Park, was proposed as a stream mitigation/restoration and wetland creation site and Kettering Community Park was proposed as a wetland enhancement/restoration and stream restoration site in the conceptual mitigation package. The MHT requested further archeological studies be completed at both locations before an effect determination could be made for the proposed actions. Completion of the Section 106 consultation for mitigation sites will be during the final design phase of the project, as stipulated in the existing MOA.

Additional details on SHA's findings for the mitigation sites can be found in the June 1, 2009 letter to the MHT, included on page **V-A-89** in the **Chapter V – Comments and Coordination** portion of this document.

The SHPO must concur with the eligibility, adverse effect, and preservation in place determinations before the Oak Grove, White's Landing, or Kettering Community Park sites would qualify for Section 4(f) protection. If required, an amendment to the MOA would resolve the adverse effect of the project on the historic property and that document. Any supplemental Section 4(f) Evaluation that might be required would be included as part of an Environmental Reevaluation conducted during the design phase of the project.

4. Conclusion

The SHA Selected Alternate would have no adverse impacts on the Sacred Heart Roman Catholic Church, but would have adverse effects on the Warfield archeological site; both are eligible for the NRHP. Since the archeological site does not qualify for preservation in place, neither NRHP site is protected under Section 4(f). A Section 106 MOA between the SHPO, FHWA, and SHA provides the required treatment for archeological finds from the Warfield and Oak Grove archeological sites should the design shift out of the explored area of potential effects. The MOA also provides for the completion of the coordination on the T. Howard Duckett dam, White's Landing and Kettering Community Park sites, should they be selected as mitigation for wetland and stream impacts from the project in final design.

The SHA Selected Alternate will not require the use of property from any known Section 4(f) resources, including publicly owned parks, recreation areas, wildlife and waterfowl refuges, or significant historic sites. Although one potentially significant archeological site will be adversely affected by SHA's Selected Alternative, preliminary evaluations and coordination with the SHPO indicates that the site does not warrant preservation in place and is chiefly important for the information that would be derived through excavation of the site, as outlined in the MOA (Refer to **Appendix E**). As Section 4(f) applies only to archeological sites that warrant preservation in place, a Section 4(f) evaluation is not required.

5. MOA

Due to the potential adverse effects to historic properties, a Section 106 MOA between MHT, FHWA, and SHA was prepared in 2007 to address the effects of the SHA Selected Alternate. FHWA submitted a copy of the final MOA, pursuant to 36 CFR §800.6(b)(1)(iv), to the ACHP who declined to participate (**see V-A-106**). The executed MOA, dated June 13, 2007, will govern the undertaking and all its parts, and FHWA will ensure that the undertaking is carried out in accordance with the MOA. The MOA stipulations include the following provision for: a) treatment of the Warfield Site (18PR33), b) treatment of the Oak Grove Site (18AN503), the Basil Hall Site (18AN511) and a submerged rock mound, c) ancillary activities and alignment modifications, d) unexpected discovery of historic properties, e) treatment of human remains, and f) performance standards.

For the treatment of the Warfield Site, SHA will develop and implement a mitigation plan for the recovery of data, in accordance with SHA's preliminary plan for the site and in consultation with MHT. The 2007 MOA details treatment for the Oak Grove Site (18AN503), the Basil Hall Site (18AN511), and the submerged rock mound (PG71A-18/Bowie Quad File # 11) should the design change; however, more recent coordination with MHT determined that a) impacts to the

Oak Grove Site continue to be limited to the area of the site already examined by archeological survey and determined insignificant, b) the Basil Hall Site is not eligible for the NRHP, and c) the submerged rock mound is not associated with the Priest's Bridge site and is not a historic resource.

For ancillary activities related to proposed wetland or other mitigation sites, stormwater management areas, hiker/biker facilities, and other alignment modifications, SHA will consult with MHT and other consulting parties to ensure that all required cultural resource studies are implemented with the applicable performance standards in Stipulation VI of the MOA. This coordination process has already been initiated with the potential stream and wetland mitigation sites.

If historic properties are identified during the project, SHA will ensure that reasonable efforts are made to avoid, minimize or mitigate adverse effects to such properties and will consult with MHT to ensure compliance with the performance standards of the MOA. If human remains, burials, or funerary objects are discovered during construction, SHA will immediately halt subsurface construction disturbance in the area of discovery and will notify MHT of the discovery.

C. NATURAL RESOURCES

The following describes the impacts to natural resources as a result of the SHA Selected Alternate. The No-Build Alternate would have no impacts on climate, soils, agricultural areas, groundwater, surface water quality, waters of the U.S., floodplains, terrestrial habitat and wildlife, aquatic habitat and wildlife, rare, threatened, and endangered species, or any increase in impervious surfaces within the Jabez Branch Watershed.

1. Climate

Greenhouse gases are trace gases that trap heat in the earth's atmosphere. Naturally occurring greenhouse gases include water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and ozone. Other greenhouse gases such as chlorofluorocarbons, hydrofluorocarbons (HFCs), and perfluorocarbons, are created and emitted solely through human activities. The principal greenhouse gases entering the atmosphere because of human activities are CO₂, CH₄, N₂O, and fluorinated gases.

As a sector, transportation is a significant source of greenhouse gases. In 2006, transportation sources accounted for approximately one quarter of the total greenhouse gas emissions in the United States. Any process that burns gasoline and diesel fuel releases CO₂ into the air. CH₄ and N₂O emissions also result from fuel combustion, while HFC emissions are associated with motor vehicle air conditioners.

In contrast with trends in other air emissions, greenhouse gas emissions from transportation continue to rise, in large part because travel growth has outpaced improvements in vehicle energy efficiency. Transportation sector emissions have grown at an average rate of about two percent annually since 1990. The sector's emissions have grown considerably faster than those

of other sectors, which averaged about 0.8 percent annually during the same period (U.S. DOT Center for Climate Change and Environmental Forecasting, 2008).

To date, no national standards have been established regarding greenhouse gases, nor has EPA established criteria or thresholds for greenhouse gas emissions. On April 2, 2007, the Supreme Court issued a decision in *Massachusetts et al. v. Environmental Protection Agency et al.* 549 U.S. 497 (2007) that the EPA does have authority under the Clean Air Act to establish motor vehicle emissions standards for CO₂ emissions. In response to the Court's decision, EPA issued a proposed endangerment and cause or contribute finding for six greenhouse gases under Section 202(a) of the Clean Air Act on April 17, 2009. The proposed endangerment finding states that current and projected greenhouse gas concentrations in the atmosphere threaten the public health and welfare. The proposed cause or contribute finding states that certain greenhouse gas emissions from motor vehicles contribute to the atmospheric concentrations of greenhouse gases and to climate change. EPA's findings were finalized on December 7, 2009 and are the first steps towards the potential regulation of greenhouse gas emissions under the Clean Air Act. However, the findings do not have any direct implications on requirements for developing transportation projects at this time.

On February 18, 2010, the Council on Environmental Quality (CEQ) issued draft guidance for public consideration and comment on the ways in which Federal agencies can consider the effects of greenhouse gas emissions and climate change in their evaluation of proposals for Federal actions under National Environmental Policy Act (NEPA). At this time, the draft guidance does not have any direct implications on developing transportation projects because it is in draft form and potentially subject to substantial change.

It is not useful or informative at this point to consider greenhouse gas emissions as part of the MD 3 Project Planning Study. Climate change is inherently a global issue. The sources of greenhouse gas emissions that scientists believe are causing the current change in climate are from all over the world, and climate change does not easily lend itself to an analysis at a local level. Further, nothing in NEPA law explicitly requires an analysis of greenhouse gases at the project level and no national standards have been established.

It is also not useful or informative to make greenhouse gas emission comparisons among the FEIS alternatives. Relative to the global scope of the problem of climate change, any difference in greenhouse gas emissions between the alternatives are not likely to be significant. The magnitude of the changes in climate caused by these scenarios and any corresponding impacts on environmental resources would be too small to measure, as current analytical tools are not sophisticated enough to accurately reflect such minute differences. Attributing any environmental consequence to the differences in emissions between the alternatives or assessing how each contributes to impacts occurring around the world is not possible in a meaningful way. As a result, the comparison of greenhouse gas emissions resulting from each analysis scenario will not provide information that will be helpful to the public or relevant to project decision-making.

Greenhouse gases are quantitatively and qualitatively different from other motor vehicle emissions, and their magnitude and breadth appear to require a different approach to address

their potential climate impacts. First, pollutant emissions are of concern, and thus regulated, in individual metropolitan or smaller areas. The climate impacts of CO₂ emissions, on the other hand, are global in nature. From a NEPA perspective, it is analytically problematic to conduct a project level cumulative effects analysis of greenhouse gas emissions on a global-scale problem. Secondly, criteria pollutant emissions last in the atmosphere for perhaps months; CO₂ emissions remain in the atmosphere far longer - over 100 years - and therefore require a much more sustained, intergenerational effort. Finally, due to the interactions between elements of the transportation system as a whole, project-level emissions analyses would be less informative than ones conducted at regional, state, or national levels. Because of these concerns, the FHWA concludes that CO₂ emissions cannot be usefully evaluated in the same way as other vehicle emissions are addressed.

The NEPA process is meant to concentrate on the analyses of issues that can be truly meaningful to the consideration of project alternatives, rather than simply "amassing" data. In the absence of a regional or national framework for considering the implications of a project-level greenhouse gas analysis, such an analysis would not inform project decision-making, while adding to the administrative burden.

2. Topography, Geology, and Soils

a. Impacts

Topography and Geology

The SHA Selected Alternate would involve cutting or filling to achieve the appropriate elevations for the roadway widening and interchange options. The study area topography does present minor limitations due to the abundance of steep slopes throughout the study area. Slope limitations will be overcome through proper engineering and design.

Soils

The soils within the study area have variable erosion potential. Erosion potential is highest in areas where grading of steep slopes is required. Soil disturbances are the greatest where land grading is necessary to construct new interchanges or intersections. The MD 450 interchange construction would impact an estimated 6.5 acres (Alternate 3 with Option A) of Bibb hydric soils located in the floodplains and wetlands of the Patuxent River.

The Bibb hydric soils are highly erodible along stream banks, are typically poorly drained, and thus have a high potential of being wetland areas. Sediment and erosion control measures would be employed to mitigate any possible sedimentation impacts due to construction, and all disturbed areas would be permanently stabilized. Specific techniques for erosion/sedimentation control to be reviewed and approved by MDE include:

- Limiting tree and shrub clearing and grubbing,
- Maintaining streams in a natural state,

- Temporary sediment traps and/or basins, silt fences, and super silt fences at specified areas,
- Diversion berms and ditches,
- Stream diversions and pump-arounds during in-stream work,
- Berming of fills and installation of temporary slope drains,
- Permanent seeding and mulching as soon as possible after grading, temporary seeding, where grading will be exposed for an extended period,
- Monitoring of acidity during construction, and
- Adherence to time of year restrictions for in-stream work.

Sediment and erosion control is extremely important to limit the disturbance effect of acidic soils on other resources, particularly aquatic resources. If necessary, SHA will monitor the acidity of nearby streams to determine if pH levels fall below acceptable levels as a result of construction activities.

Prime Farmland Soils

Prime farmland soils, including Sassafras fine sandy loam and Woodstown sandy loam soils, are present in the agricultural field adjacent to McKnew Road. The SHA Selected Alternate would not impact prime farmland soils. Grading and filling within prime farmland soil units not associated with active agricultural land may occur throughout the study area.

3. Water Quality Impacts

a. Groundwater Impacts

Sources of potential groundwater contaminants include landfills, underground storage tanks, surface impoundments and injection wells, spills, improper storage of salt or other materials on bare ground. A discussion of these potential impacts is included in **Chapter IV, Section D - Hazardous Materials/Waste Impacts**.

The study area is serviced mainly by public water supply from deep wells and construction within the area does have the potential to impact the unconfined aquifer system. The SHA Selected Alternate involves the conversion of pervious surfaces to impervious surfaces required for roadway widening. Roadway widening may also change drainage patterns. Increasing impervious surfaces and changing drainage patterns may result in a localized impact on the recharge of the unconfined aquifer and they may also reduce the base flow to streams within the study area.

b. Surface Water Impacts

The SHA Selected Alternate would cross eight perennial streams; the Patuxent River (a Maryland Scenic River), Little Patuxent River, Towsers Branch, White Marsh Branch, Jabez Branch, and three unnamed tributaries to the Patuxent River. All of the stream crossings will entail the reconstruction of existing crossings, including the Jabez Branch crossing that will utilize an existing driveway crossing for the relocation of Charles Hall Road. A total of 2.7 acres (8,854 linear feet (LF)) of perennial, ephemeral, or intermittent streams would be impacted. The Patuxent River and two of its tributaries, Little Patuxent River and Towsers Branch, are designed Use I waters (protected for fish and aquatic life, and contact recreation) within the study area. MDE regulations prohibit construction within these Use I waters between March 1 and June 15. Jabez Branch, a tributary of Severn Run, drains the northwestern portion of the study area. Jabez Branch is designated as Use III water, since its water quality and habitat support a naturally reproducing trout population. The time-of-year in-stream construction restriction for Use III waters is from October 1 through April 30.

c. Avoidance and Minimization

MDE requires stormwater management for all highway development projects. Erosion and sediment control measures will be implemented to minimize adverse impacts to surface and groundwater quality. Through the use of stormwater management best management practices, the risk of groundwater contamination by hazardous spills and roadway run-off will be reduced. Infiltration trenches, preferred by MDE for stormwater management, may be feasible if it can be demonstrated that infiltration rates of the soils in the area are sufficient and if groundwater levels are sufficiently deep. Soil borings will be performed during design to determine the feasibility of constructing infiltration trenches.

Erosion will be controlled by protecting the side slopes, ditches and other areas draining directly into the waterway with sod, seed, riprap, hydromulch, and jute netting or erosion control fabric. All disturbed areas will be stabilized and revegetated as soon as possible. Direct discharge of highway runoff to drainage ditches and streams would be avoided where possible. All natural vegetative growth outside of the project's limit of disturbance will be protected. Erosion and sediment control plans will be submitted to MDE for review and approval prior to construction. In accordance with MDE and Environmental Protection Agency (EPA) regulations, a National Pollutant Discharge Elimination System (NPDES) stormwater permit for construction activities will be required for the proposed highway and bridge construction.

The potential exists for contaminating surface water and groundwater during construction as a result of petroleum spills. The proposed erosion and sediment control measures would assist in temporarily detaining the spill.

All runoff from Charles Hall Road construction would be captured and treated within the MD 3 median before entering Jabez Branch. Limiting stormwater flow into Jabez Branch to the extent possible would prevent temperature fluctuations that could damage the sensitive trout population.

4. Jurisdictional Wetlands and Waters of the U.S.

a. Impacts

The SHA Selected Alternate would impact 11.1 acres of wetlands, including 9.1 acres of palustrine forested wetlands (PFO), 0.7 acre of palustrine emergent wetlands (PEM), 0.8 acre of PFO/PEM, 0.4 acre of palustrine open water/emergent wetlands (POW/PEM), and 0.1 acre of palustrine scrub-shrub/emergent wetlands (PSS/PEM). The majority (85 percent) of all the wetlands impacted by the project are high quality wetlands that provide principal functions of long-term storage of surface water and moderation of discharge, floodflow alteration, support for fish and shellfish populations, nutrient removal, sediment stabilization, and wildlife habitat. The wetlands have a high value for uniqueness/heritage. Over half of the wetland impacts involve large, high quality, forested wetlands in the vicinity of the proposed construction at MD 450.

Calculation of wetland impacts assumed that all of the wetland areas within the proposed rights-of-way would be drained or filled for the construction of the SHA Selected Alternate. Wetland impact calculations for the No-Build and SHA Selected Alternate are shown in **Table IV-5**. The actual impacts may be less when final design plans are prepared and limits of disturbance are defined in greater detail.

Impacts to Waters of the U.S. other than wetlands have also been calculated for the No-Build and SHA Selected Alternate (see **Table IV-6**). The SHA Selected Alternate would impact a total of 8,854 LF, crossing eight perennial streams; the Patuxent River (a Maryland Scenic River), Little Patuxent River, Towsers Branch, White Marsh Branch, Jabez Branch, and three unnamed tributaries to the Patuxent River. A complete impact matrix of wetland and other Waters of the U.S. are described in detail in the **MD 3 Natural Environmental Technical Report**.

Wetland Avoidance and Minimization Efforts

Several steps have been taken as part of the detailed engineering phase of the MD 3 Project Planning Study to avoid and minimize impacts to wetlands identified within the study area. Where reasonable and feasible, the SHA Selected Alternate's horizontal and vertical alignment for MD 3 were designed to match the existing roadway in an effort to utilize the existing slopes, thereby minimizing the need for additional areas of cut or fill.

Traditionally, a 6 to 1 (horizontal to vertical) slope is used during the Project Planning phase of study to tie-in proposed grades with the existing terrain. In an effort to minimize or avoid wetland impacts, a 4 to 1 slope was used for grading to tie-in with the existing terrain throughout the corridor with the exception of segments b-b (Sylvan Drive to Patuxent River crossing) and c-c (Patuxent River crossing to south of Clubhouse Drive). For the options developed in these segments near MD 450, proposed grading would occur at a steeper 2 to 1 slope to further minimize impacts, given the sensitivity of the Patuxent River and Little Patuxent River wetlands and floodplains. In addition, interchange options were developed for MD 450, east of existing MD 3, to minimize changes to the existing hydrology on the west side of MD 3 and to avoid potential impacts at the confluence of the Patuxent River and Little Patuxent River. These design considerations were requested by the regulatory and resource management agencies

during the initial field/office visit for the project. Additional wetland impact avoidance and minimization efforts for the SHA Selected Alternate include:

- The MD 450 loop ramp, which allows vehicles traveling eastbound on MD 450 to continue northbound on MD 3, was tightened and the design speed reduced (from 35 mph to 30 mph), thereby reducing wetland impacts by approximately one acre. Consideration was also given to a 25 mph loop ramp that minimized wetland impacts even further, but it was determined that that design would not provide safe travel conditions.
- At project initiation, through lanes were set at an 11-foot width rather than a 12-foot width to minimize wetland impacts as well as to lower vehicle speeds. The narrower lanes reduce wetland impacts by approximately 0.5 acre.
- A 2:1 outside slope has been used in the MD 450 / Patuxent River area where wetlands have been identified, resulting in a savings of approximately 16 wetland acres.
- Improvements at the Patuxent River crossing have been proposed to the east of existing MD 3 to avoid wetland impacts at the confluence of the Patuxent and Little Patuxent Rivers. Likewise, bridge lengths at the Patuxent River will be as long as or longer than the existing MD 3 structures to ensure that river hydrology is not affected.
- A total of 31 retaining walls were included at select locations throughout the corridor as part of the SHA Selected Alternate to be used in lieu of 2:1 grading slopes to minimize property, utility, and wetland impacts. Most of these walls are proposed near the Patuxent River to minimize wetland and utility impacts associated with the MD 450 interchange.

**Table IV-5
Wetland Impacts by Segment (in acres)**

		a-a	b-b	c-c	d-d	e-e	f-f	g-g	Total
		US 50 to Sylvan Drive	Sylvan Drive to Patuxent River	Patuxent River to South of Clubhouse Gate	South of Clubhouse Gate to Carver Road	Carver Road to Brickhead/Wellfleet Road	Brickhead/Wellfleet Road to St. Stephens Church Road	St. Stephens Church Road to MD 32	
No-Build	PFO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PEM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	POW/PEM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PSS/PEM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PFO/PEM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SHA Selected Alternate	PFO	0.0	5.54	2.94	0.05	0.0	0.0	0.48	9.01
	PEM	0.13	0.0	0.0	0.34	0.0	0.15	0.06	0.68
	POW	0.0	0.0	0.0	0.0	0.0	0.06	0.0	0.06
	POW/PEM	0.0	0.39	0.0	0.0	0.0	0.0	0.0	0.39
	PSS/PEM	0.0	0.07	0.0	0.0	0.0	0.0	0.0	0.07
	PFO/PEM	0.0	0.10	0.78	0.0	0.0	0.0	0.0	0.88
	Total	0.13	6.10	3.72	0.40	0.0	0.24	0.54	11.09

**Table IV-6
Waters of the U.S. Impacts by Segment (in linear feet and acres)**

		a-a	b-b	c-c	d-d	e-e	f-f	g-g	Total
		US 50 to Sylvan Drive	Sylvan Drive to Patuxent River	Patuxent River to South of Clubhouse Gate	South of Clubhouse Gate to Carver Road	Carver Road to Brickhead/Wellfleet Road	Brickhead/Wellfleet Road to St. Stephens Church Road	St. Stephens Church Road to MD 32	
No-Build	LF	0	0	0	0	0	0	0	0
	Acres	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SHA Selected Alternate	LF	1,284	745	1,839	2,355	478	322	1,831	8,854
	Acres	0.4	0.3	0.6	0.7	0.2	0.1	0.5	2.8

b. Mitigation/Permits

Section 404 of the Federal Clean Water Act requires mitigation for unavoidable wetland impacts, as does MDE's Nontidal Wetlands Protection Act and nontidal wetlands regulations (Title 26, Subtitle 23). Permits will be required by both the Corps of Engineers and MDE for impacts to wetlands and other Waters of the U.S. to construct the SHA Selected Alternate. The SHA Selected Alternate was designed to avoid identified wetlands; however, where impacts cannot be avoided, numerous adjustments were made to minimize wetland impacts as described above. Mitigation will be provided for unavoidable impacts to wetlands and other Waters of the U.S.

Mitigation Needs

A search has been conducted for potential wetland mitigation sites within the Patuxent River watershed affected by the SHA Selected Alternate. All potential wetland mitigation sites are located within the Patuxent River watershed since the wetland impacts in the Severn River watershed are minimal (0.01 acres). Wetland restoration of prior converted cropland was given priority in the site selection process. Creation of new wetlands by deep excavation was considered less desirable due to the uncertainty of existing groundwater and the potential excavation and hauling cost. Studies of the Patuxent River watershed concluded that the quality of water in the Patuxent River within the study area is degraded and deteriorating stream conditions have resulted from three major problems; excess nutrients, sediment runoff, and toxic chemicals. Excess nutrient loading was identified as the largest water quality issue of immediate concern. Approximately 7,977 LF of 8,854 total LF of waterway are designated as either a perennial or intermittent watercourse requiring mitigation at a 1:1 ratio

As stated previously, the SHA Selected Alternate impacts approximately 11.1 acres of wetlands. Approximately 21.1 acres of wetland mitigation would be required to compensate for unavoidable wetland impacts associated with the SHA Selected Alternate, based on replacement ratios required by the Corps and MDE, as stipulated in the Maryland Compensatory Mitigation Guidance developed by the Interagency Mitigation Task Force and COMAR. The goals of the mitigation are to replace, preserve, and enhance wetland functions lost due to the project and to mitigate within the same watershed as the impacts. Using the New England methodology for assessing wetland functions and values, the primary wetland functions are groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment/toxicant reduction, nutrient removal, sediment stabilization, and wildlife habitat. The primary wetland value is uniqueness/heritage.

Methodology for Wetland Mitigation and Stream Restoration

Four wetland mitigation sites were identified in the DEIS. These sites were located in Anne Arundel County within the Patuxent River watershed. Through further study it was determined that only one of the four sites, Site # 1 – Existing MD 450 and adjacent areas west of MD 3, remains a viable wetland mitigation site. The other sites were determined to be either not technically feasible or to possess significant ownership constraints. In addition, the DEIS did not identify potential stream mitigation sites. Therefore, investigations for additional sites were needed.

The wetland and stream mitigation site search began with a review of existing documents and a GIS site search. A senior erosion control specialist at the Anne Arundel County Soils Conservation District, representatives from the Prince George's County Soil Conservation District, and the Maryland-National Capital Park and Planning Commission were also contacted to assist in the identification of additional sites. Potential mitigation sites were evaluated during the windshield surveys and through field review/verification with representatives from SHA. Site visits and soil profile borings were conducted on those sites where permission was granted by the property owners. Two agency field reviews of the potential wetland and stream mitigation sites were held on February 10, 2005 and May 17, 2005 to review potential mitigation and restoration sites attended by USFWS, ACOE, and MDE.

An additional wetland and stream mitigation search was conducted in 2007 and 2008 primarily due to conflicts associated with the proposed mitigation site, Site PR-267, Lot 1 (see **Figure IV-5** for more detail on this location). A portion of this preservation site, specifically Lot 1, was proposed for development of a Wal-Mart by the property owner in fall 2006. Site PR-267 was recognized by the agencies as one of the best opportunities to preserve the functions and values lost from the high quality wetlands of the Patuxent River being impacted by the MD 3 project. Therefore, a supplemental site search was conducted to identify additional sites in the Patuxent River watershed, and this search was expanded into Howard County. Potential mitigation sites were initially identified through a GIS model custom-designed for the MD 3 project. This was followed by windshield surveys and then verified in the field. Agency field reviews were conducted on September 6 and November 30, 2007 and July 18, 2008.

A meeting to present and discuss the conceptual mitigation and preservation sites was held December 11, 2008 between SHA and environmental regulatory agency representatives from the EPA, MDE, USFWS, and USACOE. During this meeting, the agency representatives agreed that the combination of measures to minimize impacts to existing wetlands, especially SHA's inclusion of retaining walls along the proposed improvements at MD 450 that would reduce wetland impacts to 11.1 acres, qualified as the least environmentally damaging alignment. In addition, the agencies strongly supported preservation of the wetland and floodplain portions of Site PR-267 (Lots 1-4) with a 100-foot buffer from the toe of the adjacent slopes as the majority of the required mitigation for wetland impacts from the proposed improvements in advance of the right-of-way acquisition process later in project development.

At the March 18, 2009 Interagency meeting, in which the USFWS staff presented the biological benefits associated with expanding the Maryland range of the America eel, the regulatory agency staff expressed a preference for construction of an eel passage on the T. Howard Duckett (Rocky Gorge) dam as part of the required conceptual mitigation in lieu of two acres of wetland enhancement (PR-333) and 6,400 linear feet of stream restoration (PR-333 and PR-387).

Wetland and Stream Mitigation Process Change

During the August 28, 2009 meeting (see **V-A-99** for meeting minutes) with the EPA, USFWS, ACOE, MDE, and FHWA staff regarding the State's fiscal constraints and its inability to pursue the advanced purchase of proposed mitigation site PR-267, it was agreed that the SHA would only seek concurrence on the MD 3 SHA Selected Alternate from regulatory agency

representatives at this time. (Copies of the concurrence letters and meeting minutes can be found in the **Chapter V - Comments and Coordination** section of this document.) This action will separate the wetland permit and mitigation site acquisition process from the approval process for the NEPA document. Once design and right-of-way funding is allocated for the project, the SHA has agreed to further investigate the agency recommendations regarding mitigation for water resource impacts.

A follow-up presentation to the Agency Representatives occurred on September 16, 2009, at which SHA presented the findings of the August 28, 2009 field review and again requested concurrence. A copy of the meeting minutes can be found on page **V-A-102**.

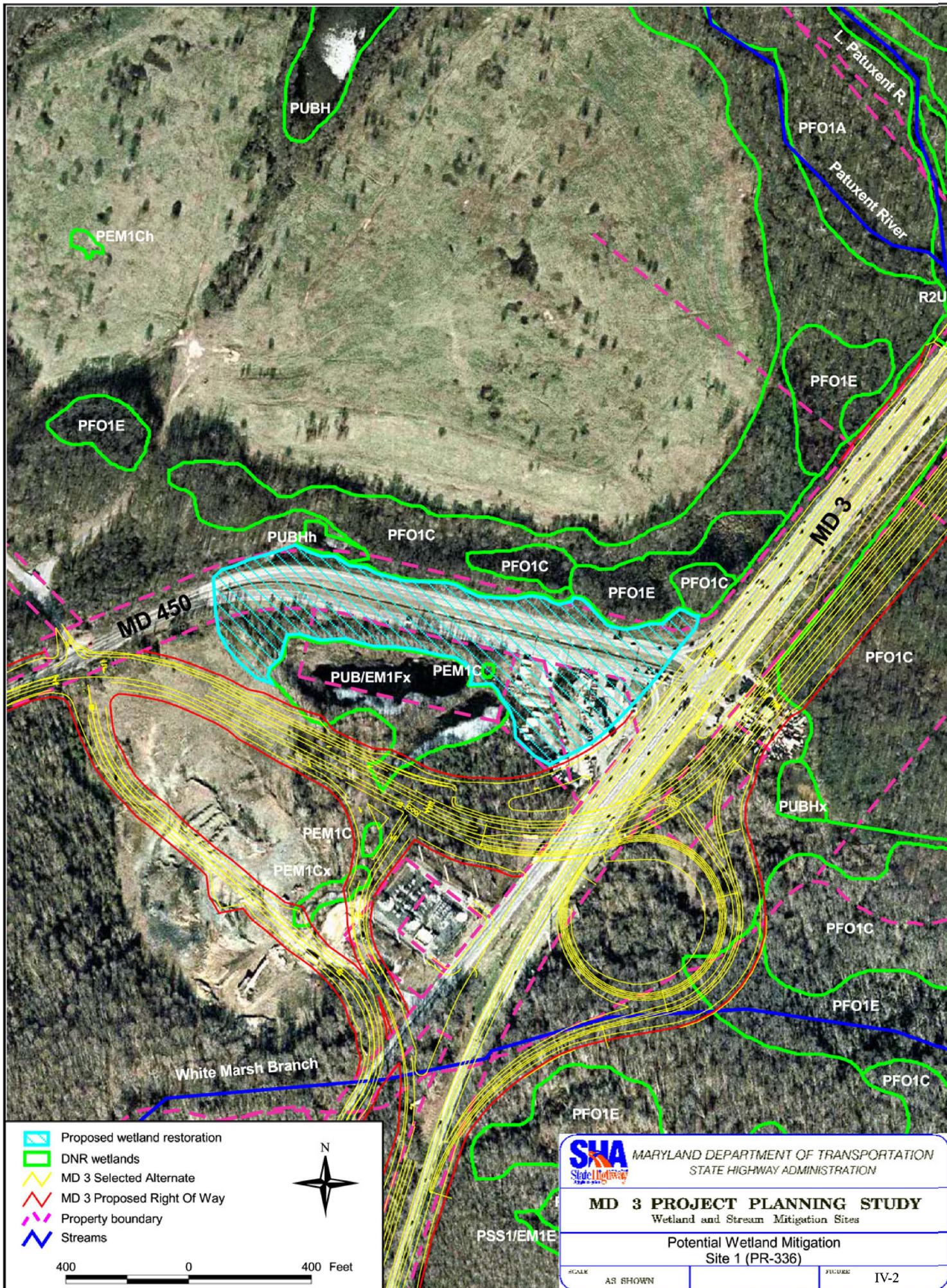
Wetland Mitigation and Stream Restoration Sites

The following discussion summarizes the potential mitigation sites selected for further studies and the recommended restoration/mitigation concept based on agency feedback at the field reviews.

PR-336 (Site 1): MD 450 Realignment – PR-336 (see **Figure IV-2**) is located adjacent to existing MD 450 and was ranked as “high” by MDE and USACOE. A total of approximately 10.8 acres of potential wetland mitigation was identified at this site. The site is owned by the City of Bowie, and is zoned as open space and its land use is defined as agricultural. MD 450 will be realigned south of the existing MD 450 alignment and for the SHA Selected Alternate. The existing MD 450 alignment will be removed for approximately 1,500 linear feet (LF), which will allow the expansion/restoration of Wetland 3 and the Patuxent River floodplain. The proposed mitigation might include a combination of forested and emergent wetlands. Excavation of the existing road, contouring of the existing ground, and the adjusting surface drainage patterns from the adjacent proposed MD 450 realignment may be necessary to provide suitable hydrology.

PR-267: Lot 5 – Mitigation site PR-267/Lot 5 (see **Figure IV-3**) is located on the west side of the proposed Ramp 3 at the MD 450 interchange. SHA has already purchased the lot in association with the MD 450 interchange. SHA proposes to create and/or restore the floodplain wetlands and reconnect them to existing wetlands. The area is estimated to yield 4.2 acres of mitigation credit. Once graded to proper elevations for wetland establishment, it is anticipated that the area will develop into a palustrine forested wetland interspersed palustrine emergent and scrub-shrub areas, similar to the adjacent floodplain wetlands along the Little Patuxent River. The creation/restoration would involve excavating down to the existing wetland boundary to an elevation of approximately 33 feet. The depth of excavation needed varies from one-foot to 15 feet throughout the site. A rough estimate of the volume of cut required for the entire site is 46,000 cubic yards. The excavated material could potentially be used in the MD 3 project. SHA will incorporate a 25-foot wetland buffer along the proposed right-of-way for Ramp 3 at an elevation one to two feet above the wetland elevation. Trees impacted by the proposed wetland mitigation construction will be replaced in accordance with the Maryland Reforestation Law.

PR-333: Dorsey Run – Site PR-333 (see **Figure IV-4**) is located in Anne Arundel County on the Maryland House of Corrections property within the Little Patuxent River watershed. More

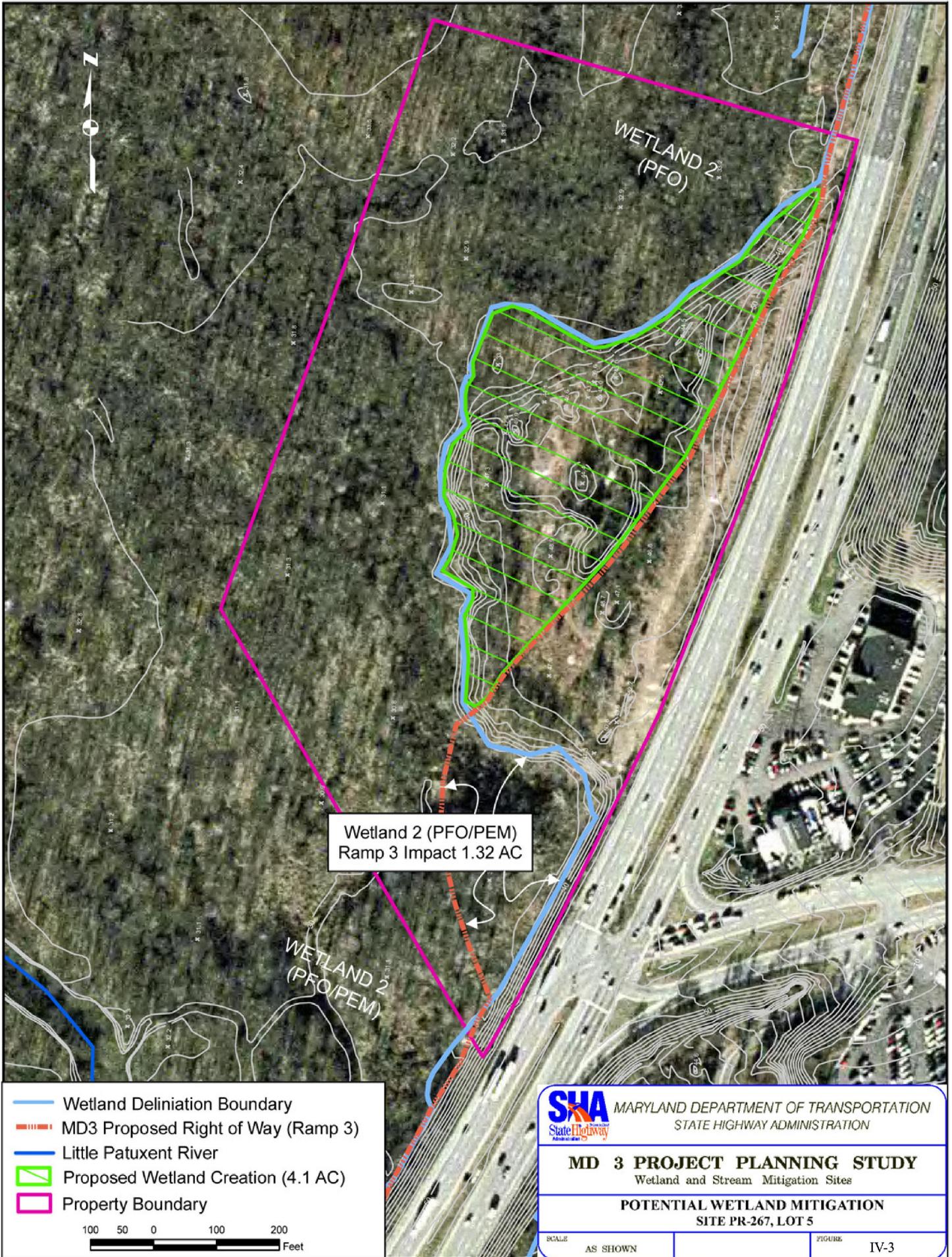


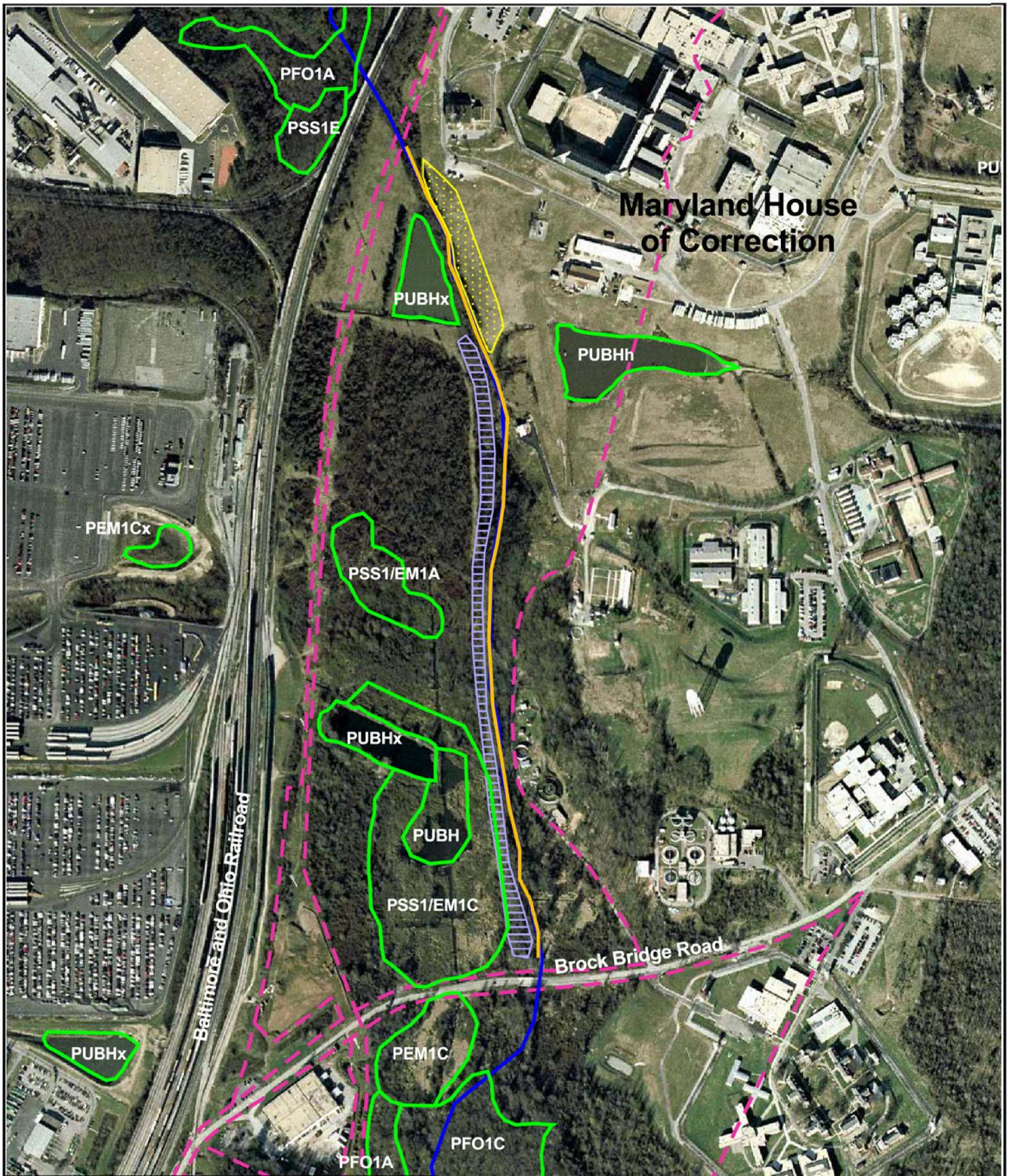
	Proposed wetland restoration
	DNR wetlands
	MD 3 Selected Alternate
	MD 3 Proposed Right of Way
	Property boundary
	Streams

N

400 0 400 Feet

<p>SHA State Highway Administration</p>	MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION	
	MD 3 PROJECT PLANNING STUDY Wetland and Stream Mitigation Sites	
Potential Wetland Mitigation Site 1 (PR-336)		
SCALE	AS SHOWN	FIGURE
		IV-2





Maryland House of Correction

Baltimore and Ohio Railroad

Brock Bridge Road

-  Stream restoration
-  Streams
-  Proposed Riparian Buffer Enhancements
-  Wetland restoration/removal of existing berm
-  DNR wetlands
-  Property boundary







MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 3 PROJECT PLANNING STUDY
Wetland and Stream Mitigation Sites

Potential Wetland and Stream Mitigation Site
Dorsey Run Site (PR-333)

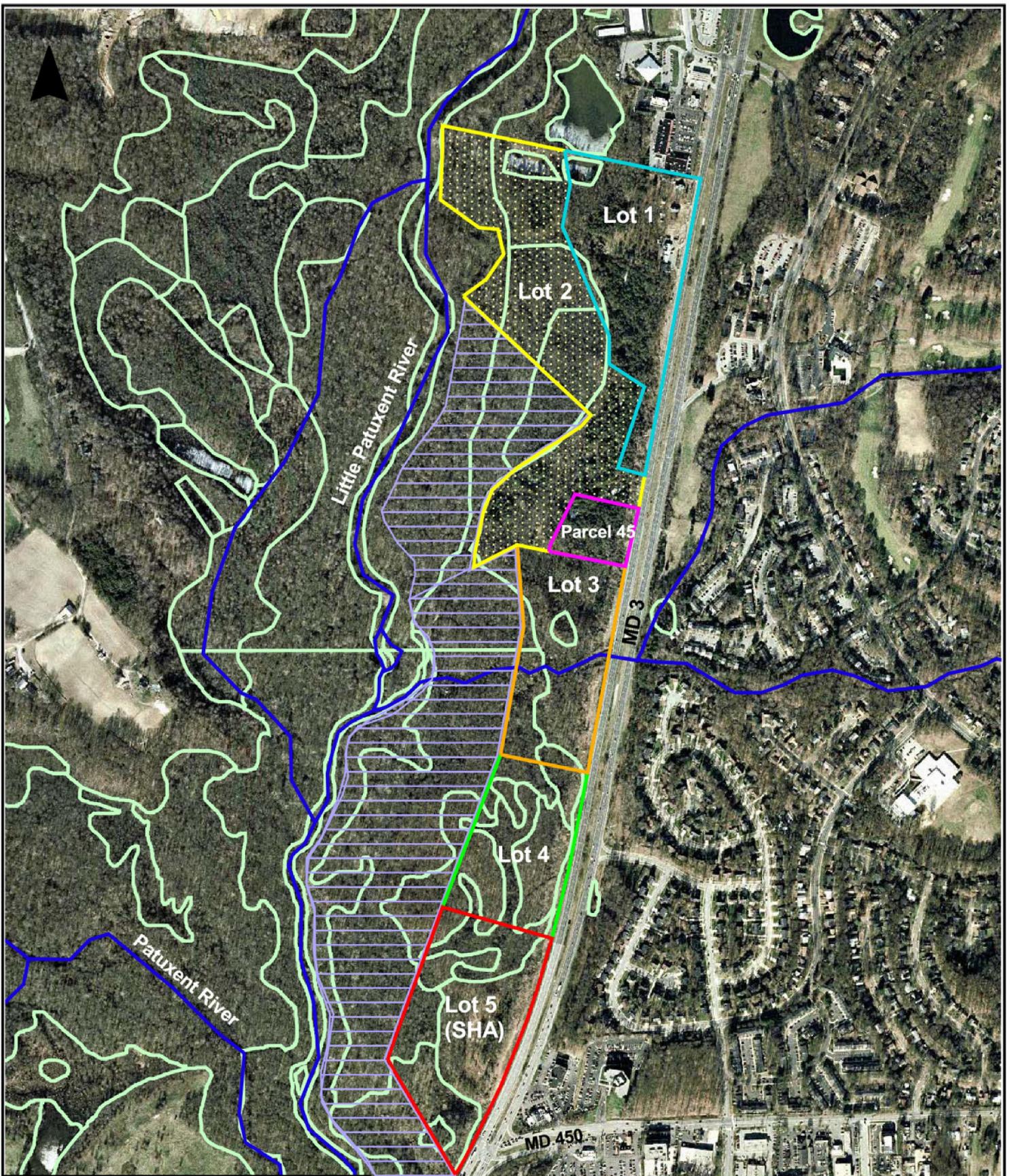
SCALE	AS SHOWN	FIGURE	IV-4
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specifically it is located along Dorsey Run between Brock Bridge Road and Old Farm Road (Anne Arundel and Howard County line), and runs parallel to House of Correction Road. This is an existing wetland and stream mitigation site that has been accepted by the environmental review agencies for 3,400 LF of stream mitigation and two acres of wetland enhancement (resulting in 0.5 acres of wetland mitigation credit). Additional stream mitigation identified within the site consists of planting a minimum 100-foot riparian buffer for approximately 1,000 LF on the east side of Dorsey Run just upstream of the areas previously accepted for MD 3 mitigation. Based on agency correspondence, this will provide an additional 500 LF of stream mitigation credit. The eel passage at the T. Howard Duckett was recommended by the USFWS and the USACOE staff to replace 3,400 linear feet of stream restoration.

PR-267: Lots 1, 2, 3, 4 - These sites (see **Figure IV-5**) are located between MD 3 and the Little Patuxent River just upstream of its confluence with the Patuxent River. The site was investigated pursuant to a request made by the ACOE and the USFWS to be used as a wetland preservation site for the MD 3 project. At the time of the wetland mitigation site search, a majority of the properties were owned by 1691 Limited Partnership, which had plans to develop the upland areas of the property adjacent to MD 3, and possibly trade a portion of the land to Anne Arundel County as part of their Master Plan (Greenway Program). A majority of the land identified has extensive forested, scrub-shrub and emergent wetland communities throughout the Little Patuxent floodplain. It was identified as one of the best opportunities to preserve the functions and values lost from the high quality wetlands being impacted along the Patuxent River from the MD 3 Project. SHA is currently negotiating the purchase of the wetland and floodplain (100-year) portions as well as a protective buffer approximately starting at the toe of the slope and extending approximately 100 feet towards MD 3. The preservation of the wetland and 100-foot buffer in Lots 1-4 would provide sufficient credit to fulfill the wetland mitigation need. SHA is coordinating with Anne Arundel County to determine whether these areas can be added to the County Greenway Program.

PR-387: White's Landing Road – This site (see **Figure IV-6**) is located toward the end of and on the south side of White's Landing Road, within the Patuxent River Park in Prince George's County. The site is owned by the Maryland-National Capital Park and Planning Commission (M-NCPPC). PR-387 was ranked as "high" for stream mitigation by MDE, the USACOE, and the USFWS. The site is adjacent to the Patuxent River to the east and Full Mill Branch to the south. The site has the potential to provide 3,000 LF of stream restoration by providing a 150-foot buffer along the Patuxent River. The site can also be utilized for reforestation, as well as educational opportunities for an expanded Greenway trail proposed by the M-NCPPC. The first year of groundwater level monitoring data has been collected, and shows that this site would support creation of a 6.75 acre wetland. The USFWS and USACOE staff recommended that the White's Landing Road site be placed on the mitigation secondary list for wetland creation and that the stream mitigation be replaced by eel passage at the T. Howard Duckett dam site.

Based on preliminary estimates (see **Table IV-7**), these sites can satisfy the mitigation requirements for the wetland and stream impacts of the SHA Selected Alternate. In addition to providing the appropriate acreage of wetlands and streams to compensate for those impacted, the goals of the mitigation are to replace and enhance the desired wetland function and values lost by the proposed project, and to locate the wetland mitigation sites within the same watershed



 Waterways
 Lot 1 (Proposed Wetland Preservation)
 Anne Arundel County Property (Greenway Program)
 DNR Wetlands
 Associated Properties of Site are Labeled

N

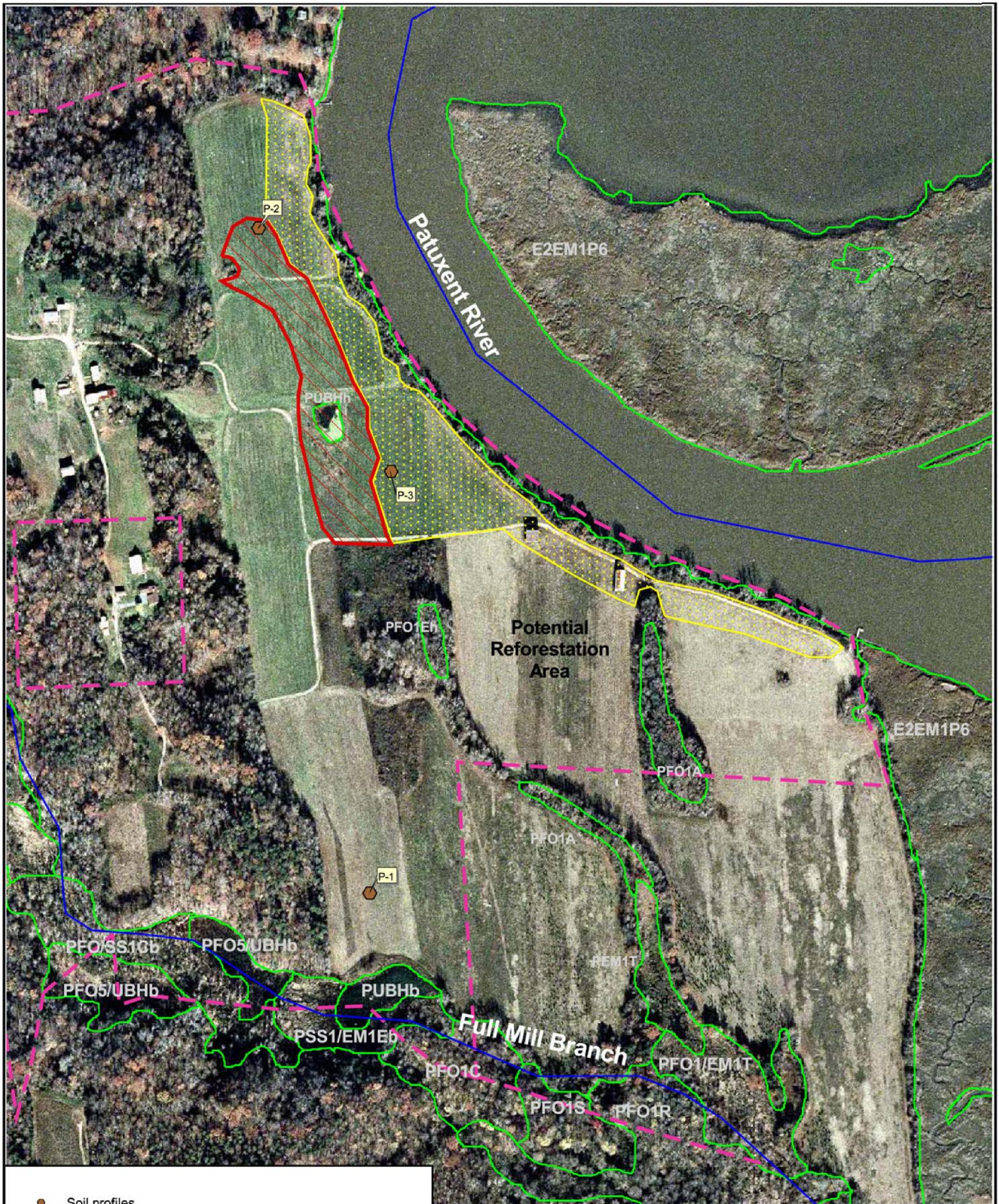
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 MARYLAND DEPARTMENT OF TRANSPORTATION
 STATE HIGHWAY ADMINISTRATION

MD 3 PROJECT PLANNING STUDY
 Wetland and Stream Mitigation Sites

Potential Wetland Preservation Site
 Site PR-267

SCALE AS SHOWN		FIGURE IV-5
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-  Soil profiles
-  Streams
-  Property boundary
-  Riparian buffer enhancements
-  DNR wetlands
-  Proposed wetland restoration







MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 3 PROJECT PLANNING STUDY
Wetland and Stream Mitigation Sites

Potential Wetland and Stream Mitigation
Site PR-387

SCALE AS SHOWN	FIGURE IV-6
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(Patuxent River Watershed) as the impacted wetlands. These proposed sites are subject to change based on site availability and costs once design funding becomes available. The next step in the process will be to continue discussions with the property owners to determine willingness to sell or place an easement on their properties.

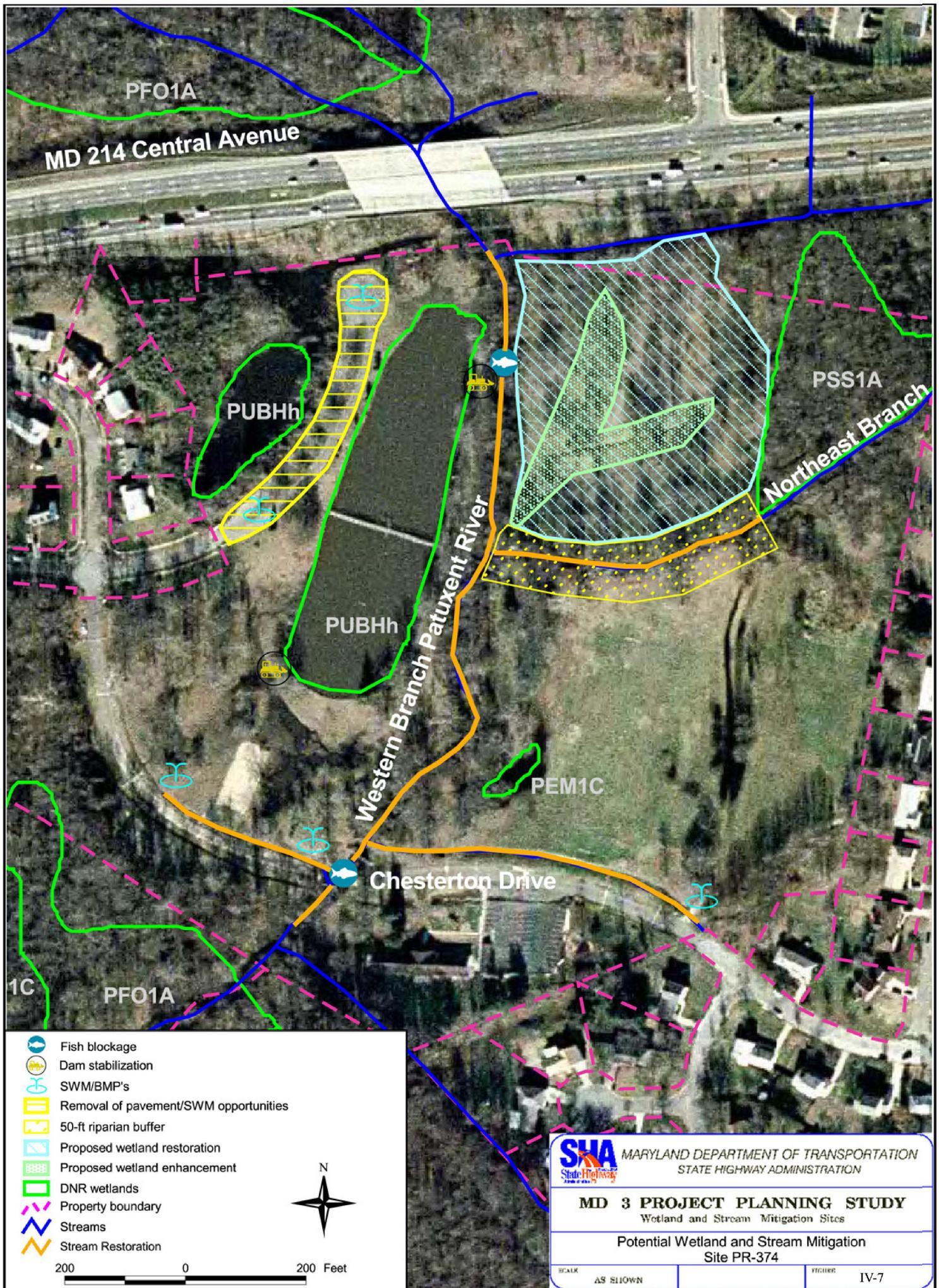
Secondary Mitigation

If during future phases of study any of the aforementioned sites are determined as no longer feasible, the following sites have been identified as back-up mitigation sites for the project. These sites were not selected over the primary mitigation sites for a variety of reasons, including lack of property owner interest, proximity to project location, and agency requests.

PR-374: Kettering Community Park – This community park (see **Figure IV-7**) near Largo, Maryland in Prince George’s County is owned by the Kettering Community Association and was ranked as “high” by MDE and the USACOE. Mitigation at this site would include wetland restoration and enhancement, riparian buffer enhancements and fish passage enhancements. The proposed mitigation at this site would provide approximately four acres of wetland mitigation (one acre of credit) and 1,600 LF of stream restoration.

PR-387: White’s Landing Road – This site (refer back to **Figure IV-6**) is on the primary list for stream restoration, but also has the potential to provide wetland mitigation by creating a series of pocket wetlands. Groundwater monitoring wells were installed on the property and a water budget will be developed for the site to verify the wetland creation potential. Preliminary estimates have been calculated to provide approximately 6.75 acres of wetland mitigation.

PR-339 (Site 31): Behnke Nursery – PR-339 (see **Figure IV-8**) is a former sand and gravel operation located off of Sands Road in Anne Arundel County, Maryland and was ranked as “very high” by two of the three agency representatives. Behnke Nursery now owns the site and uses it as a growing facility. This site was identified through coordination with the U.S. Department of Agriculture Natural Resource Conservation Service, Annapolis Service Center. It was noted that this site (approximately 72 acres) may be an excellent educational site and it ties into the Greenway as well. The entire site is recommended for preservation as one of the best opportunities to preserve the functions and values lost from the high quality wetlands being impacted along the Patuxent River from the MD 3 Project. A mitigation ratio of 10:1 would be implemented for this site allowing for 7.2 acres of wetland mitigation credit.



- Fish blockage
- Dam stabilization
- SWMBMP's
- Removal of pavement/SWM opportunities
- 50-ft riparian buffer
- Proposed wetland restoration
- Proposed wetland enhancement
- DNR wetlands
- Property boundary
- Streams
- Stream Restoration



200 0 200 Feet

SMA MARYLAND DEPARTMENT OF TRANSPORTATION
 STATE HIGHWAY ADMINISTRATION

MD 3 PROJECT PLANNING STUDY
 Wetland and Stream Mitigation Sites

Potential Wetland and Stream Mitigation
 Site PR-374

SCALE	AS SHOWN	FIGURE	IV-7
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**Table IV-7
Estimated Mitigation (Quantities)**

Site	Wetland Mitigation Credit (Acres)	Stream Restoration Potential (LF)	Wetland Mitigation Type	Function and Values to be Replaced
PR-336 (Site 1): MD 450 Realignment	10.8	-	PFO	groundwater recharge and discharge, floodflow alteration, sediment/toxicant reduction, nutrient removal, sediment stabilization, wildlife habitat, uniqueness/heritage, and visual quality/aesthetics
Site PR-267: Lot 5	4.2	-	PFO/PSS/PEM	floodflow alteration, fish and shellfish habitat, sediment/toxicant reduction, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, educational value, uniqueness/heritage, and visual quality/aesthetics
PR-333: Dorsey Run	0.5	3,400	PFO	floodflow alteration, fish and shellfish habitat, sediment/toxicant reduction, nutrient removal, sediment/shoreline stabilization, wildlife habitat
Site PR-267: Lot 1	*(2.74 acres preservation)	-	PFO/PSS/PEM	floodflow alteration, fish and shellfish habitat, sediment/toxicant reduction, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, educational value, uniqueness/heritage, and visual quality/aesthetics
Site PR-267: Lot 2	*(18.5 acres preservation)	-	PFO/PSS/PEM	floodflow alteration, fish and shellfish habitat, sediment/toxicant reduction, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, educational value, uniqueness/heritage, and visual quality/aesthetics
Site PR-267: Lot 3	*(6.4 acres preservation)	-	PFO/PSS/PEM	floodflow alteration, fish and shellfish habitat, sediment/toxicant reduction, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, educational value, uniqueness/heritage, and visual quality/aesthetics
Site PR-267: Lot 4	*(14.8 acres preservation)	-	PFO/PSS/PEM	floodflow alteration, fish and shellfish habitat, sediment/toxicant reduction, nutrient removal, production export, sediment/shoreline stabilization, wildlife habitat, recreation, educational value, uniqueness/heritage, and visual quality/aesthetics
PR-387: White's Landing Road	-	3000	-	floodflow alteration, fish and shellfish habitat, sediment/toxicant reduction, nutrient removal, sediment/shoreline stabilization, wildlife habitat
Total Estimate	*	6,400**	<i>*Preservation package provides balance of wetland credit. **Eel passage is a potential substitution</i>	
Mitigation Needed	21.1	7,977	<i>(1:1 ratio not required for stream mitigation)</i>	

Alternative Mitigation - Eel and Fish Passage Sites

At the March 18, 2009 interagency presentation of the MD 3 Selected Alternative/Compensatory Mitigation package, USFWS staff provided information about seven American eel and fish passage projects that could be used by SHA as mitigation in this and/or future projects (**Table IV-8**). These sites range across the State and require construction of eel passageways and dam breach/removal to increase eel habitat from 14-50 miles in the targeted streams.

Table IV-8
Secondary Mitigation Sites*

Watershed/Stream (if differs)	Dam County Location	Project	Estimated Cost – Design and Construction
Patuxent	Fort Meade Dam Anne Arundel County	Dam removal would add 8 miles to Hickory Shad, herring and eel habitat range	\$500,000
	Rocky Gorge Dam Prince George's County	Eel passage at this dam would allow eels to migrate an extra 14 miles as juveniles.	\$250,000
	Tridelphia Reservoir Montgomery County	Eel passage at this location, in conjunction with the Rocky Gorge Dam work, would allow eels to move freely throughout the 29 mile Patuxent River watershed.	\$250,000
Patapsco North Branch Patapsco	Liberty Dam Carroll and Baltimore Counties	Eel passage here would add 15 miles of habitat. The four dams below Liberty Dam have been slated for removal or have support for their removal.	\$250,000
Gunpowder River Gunpowder Falls River	Pretty Boy Dam Baltimore County	Eel passage at this site would add more than 10 miles to juvenile and maturing eel habitat.	\$250,000
	Loch Raven Dam Baltimore County	Eel passage would add 26 miles of habitat for juvenile and maturing eels.	\$250,000
Potomac	Cumberland Dam Allegany County	Breach or removal of this dam would add 50 miles to eel, smallmouth bass and walleye range.	\$2,300,000

*Recommended by USFWS

The USFWS staff stated a preference for the T. Howard Duckett project, citing their opinion that it would provide greater aquatic benefits than the reforestation at Whites Landing Road (PR-387)

and the stream restoration of Dorsey Run (PR-333). Creating an eel passageway at this dam on the Patuxent River would add 14 miles of habitat for American eel juveniles and would be acceptable to the USFWS and USACOE staff as mitigation for the 7,977 LF of stream channel impacts from the MD 3 project.

Additional information is needed before this potential mitigation facility can be forwarded to the Final Design team. The USFWS staff must provide final cost estimates for construction, installation, and maintenance of an eel passage at the 134-foot tall T. Howard Duckett dam and consult with the Washington Suburban Sanitary Commission to determine if the installation of an eel passage is permissible. Since the eels could complete their return migration to the Sargasso Sea through the dam, the USACOE and MDE representatives are open to the idea of eel passage as stream impact mitigation, after review of the additional information.

5. Floodplains

a. Impacts

FEMA FIRM data for the study area shows 100-year and 50-year floodplains for Towsers Branch, Little Patuxent River, Patuxent River, and a tributary to the Patuxent River. Floodplain impacts have been calculated for the SHA Selected Alternate assuming that all of the 100-year floodplains within the proposed rights-of-way would be impacted by the construction of the SHA Selected Alternate (**Table IV-9**). The actual impacts may be less when final design plans are prepared and floodplain impacts are calculated at a greater level of detail.

**Table IV-9
Floodplain Impact (in acres)**

	a-a	b-b	c-c	d-d	e-e	f-f	g-g	Total
	US 50 to Sylvan Drive	Sylvan Drive to Patuxent River	Patuxent River to South of Clubhouse Gate	South of Clubhouse Gate to Carver Road	Carver Road to Brickhead/Wellfleet Road	Brickhead/Wellfleet Road to St. Stephens Church Road	St. Stephens Church Road to MD 32	
No-Build	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SHA Selected Alternate	0.6	39.7	8.6	0	1.4	0.0	0.0	50.3

The majority of the floodplain impacts are within the Patuxent River floodplain. The remaining floodplain impacts are within the floodplain of an unnamed tributary to the Little Patuxent River and an unnamed tributary of Towsers Branch. A series of culverts under MD 3 currently exist that have altered the natural floodplain elevations. Accordingly, the FEMA map would need to be updated in the study area to accurately depict the 100-year floodplain and the associated floodplain impacts. Accurately mapping the 100-year floodplain would most likely eliminate floodplain impacts along segment e-e (Carver Road to Brickhead/Wellfleet Road) for the two

unnamed tributaries since the culverts have greatly reduced the actual area flooded by the 100-year event. Floodplain impacts along the Patuxent River would still exist, although the amount of impact would be greatly reduced.

b. Mitigation/Permits

A floodplain permit is required by MDE for any land-disturbing activity totaling 5,000 square feet or more within the floodplain district (including associated 25-foot Building Restriction Line) and for temporary or permanent construction involving the placement of a structure, regardless of the size of the disturbed area. In Maryland, the process of obtaining a permit is initiated by filing a *Joint Federal/State Application* for the alteration of any floodplain, waterway, tidal or nontidal wetland in Maryland. Should the roadway project increase floodplain elevations on any adjoining properties, MDE may require that either the adjoining properties be acquired or that an easement be placed on the property limiting its use. Impacts to increases in floodplain elevations can also be mitigated by providing compensatory flood storage, i.e., by excavating adjacent non-floodplain area to provide an equal or greater volume for flood storage.

6. Terrestrial Habitat and Wildlife

a. Impacts

Agricultural Impacts

There would be no impacts to agricultural land resulting from the SHA Selected Alternate. Further details regarding impacts to agricultural land are included in the previous discussion in the **Prime Farmland Soils** section of this chapter.

Forest Impacts

The forested areas not only provide habitat for diverse wildlife, but also play a critical role in the improvement and maintenance of water, soil and air quality. The data in **Table IV-10** show the approximately 82.5 acres of forest impacts for the SHA Selected Alternate. Calculation of these impacts assumed that all forest within the proposed right-of-way would be removed. The majority of the impacts for the SHA Selected Alternate are near the Patuxent River, the largest terrestrial habitat in the study area. The majority of the impacts to forested areas throughout the corridor result from grading needs associated with roadway widening and interchanges.

In addition to the impacts noted below, some vegetative and forested areas outside of the right-of-way of the SHA Selected Alternate may be impacted due to unforeseen circumstances. While SHA has already been very conservative with impact estimates and will make every effort to minimize impacts during design and construction phases, vehicle access and unforeseen changes to the roadway design may extend impacts beyond the current estimates in certain locations. Forest replacement and proposed landscape plantings will assist in mitigating the impacts to forests resulting from construction.

**Table IV-10
Forest Impacts - Not Including Wetlands (in acres)**

	a-a	b-b	c-c	d-d	e-e	f-f	g-g	Total
	US 50 to Sylvan Drive	Sylvan Drive to Patuxent River	Patuxent River to South of Clubhouse Gate	South of Clubhouse Gate to Carver Road	Carver Road to Brickhead/Wellfleet Road	Brickhead/Wellfleet Road to St.Stephens Church Road	St. Stephens Church Road to MD 32	
No-Build	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SHA Selected Alternate	8.5	25.8	12.4	3.1	6.7	4.7	21.3	82.5

Forest Interior Dwelling Species

A Great Blue Heron colony is located in upland forest approximately 0.25 mile west of MD 3, and, therefore, no disturbance to the birds during the nesting season is anticipated. The Department of Natural Resources (DNR) advises that Forest Interior Dwelling Species (FIDS) exist within the large expanse of forest present within the study area. These species may be disturbed by the MD 3 project. Impacts from roadway construction will be minimized according to the guidelines provided by the DNR. These guidelines are included in **Chapter V – Comments and Coordination, page V-A-107** of this document.

Specimen Trees

The SHA Selected Alternate impacts 49 specimen trees. The greatest number of impacts to specimen trees (minimum trunk diameter of 30 inches at breast height) would be at segments a-a (US 50 to Sylvan Drive) and b-b (Sylvan Drive to Patuxent River), as shown on **Table IV-11**. The impacts to specimen trees for segment b-b would be attributed to the separation of MD 3 and MD 450. Impacts associated with specimen trees for the SHA Selected Alternate are listed in the **MD 3 Natural Environmental Technical Report**.

**Table IV-11
Impacts to Specimen Trees**

	a-a	b-b	c-c	d-d	e-e	f-f	g-g	Total
	US 50 to Sylvan Drive	Sylvan Drive to Patuxent River	Patuxent River to South of Clubhouse Gate	South of Clubhouse Gate to Carver Road	Carver Road to Brickhead/Wellfleet Road	Brickhead/Wellfleet Road to St.Stephens Church Road	St. Stephens Church Road to MD 32	
No-Build	0	0	0	0	0	0	0	0
SHA Selected Alternate	12	22	0	0	4	0	11	49

b. Mitigation

Avoidance and minimization measures have been incorporated into the SHA Selected Alternate, see **Section C – Alternate Avoidance and Minimization Efforts**.

Impacts to forests are addressed in the 1989 Maryland Reforestation Law (per Natural Resources Article 5-103) and the Roadside Tree Law for SHA projects using State funds. The law requires that transportation projects remove only the minimum number of trees and other woody species necessary and that the project be consistent with sensible design practices. Replacement of trees is required at a 1:1 ratio if forest impacts total more than one acre. Based on estimated impacts for the SHA Selected Alternate, approximately 83 acres of forest would need to be replaced. Preference for mitigation would be either on-site or within the same County or watershed.

The Roadside Tree Law protects any tree that grows all or in part within a public right-of-way by requiring that before a roadside tree is removed, trimmed or cared for, a Tree Care Permit must be obtained from the Maryland DNR Forest Service. A permit is also required when “underground construction such as tunneling, trenching, or boring impact the root zone of a roadside tree. A permit is also needed to plant a tree within the public road right-of-way.”

7. Aquatic Habitat and Wildlife

a. Impacts

Aquatic resources within the Patuxent River will be temporarily impacted during construction of the SHA Selected Alternate and by permanent stream impacts during the life of the facility. Sedimentation during roadway and bridge construction has the potential to degrade water quality, thus impacting aquatic habitat and wildlife. Siltation on streambeds has an adverse effect on the habitat for fish spawning and macroinvertebrate production. Turbidity within the water column also has a negative effect on the production of rooted aquatic plants, which are an important food source, and important for the production of epiphytic organisms. Degradation of surface water quality can also affect the species composition of the stream or river, as species tolerant of poorer water quality replace those that require good water quality. Long-term impacts to aquatic resources result from water quality and quantity effects of increased storm water runoff, including increased loading of deicing chemicals, sediment, and hydrocarbons.

As a result of the July 2003 agency field review the regulatory agencies requested that the increase of impervious surfaces within the Jabez Branch watershed be identified. **Table IV-12** shows the acreage of additional impervious surface that would result from the SHA Selected Alternate including the MD 175 and Charles Hall Road improvements. The SHA Selected Alternate adds 53.9 acres of impervious surface. The increase in impervious surfaces in Jabez Branch watershed is shown in **Table IV-12** under Segment g-g, Severn River.

The majority of the proposed improvements exist within the Patuxent River Watershed, segments a-a through a portion of segment g-g. The remaining proposed improvements exist within the Severn River Watershed, segment g-g.

**Table IV-12
Impervious Surface Impacts**

<i>Segment</i>	a-a	b-b	c-c	d-d	e-e	f-f	g-g		Total
<i>Location</i>	US 50 to Sylvan Drive	Sylvan Drive to Patuxent River	Patuxent River to South of Clubhouse Gate	South of Clubhouse Gate to Carver Road	Carver Road to Brickhead/Wellfleet Road	Brickhead/Wellfleet Road to St. Stephens Church Road	St. Stephens Church Road to MD 32		
<i>Watershed</i>	Patuxent River	Patuxent River	Patuxent River	Patuxent River	Patuxent River	Patuxent River	Patuxent River	Severn River	
No-Build	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SHA Selected Alternate	4.1	15.3	4.8	13.6	1.9	5.4	8.8		53.9

b. Mitigation

All waters within the project area are considered Use I streams (Water Contact Recreation, Protection of Aquatic Life), except for Jabez Branch which is classified as a Use III stream (Natural Trout Waters). For any in-stream construction proposed, a Section 404 permit from the Corps and/or a MDE Wetland and Waterway Permit will be required. Stormwater management and sediment and erosion control plans to minimize impacts to aquatic resources will also be prepared and implemented in accordance with MDE regulations.

Stormwater flow into Jabez Branch will be limited as much as possible to prevent temperature fluctuations. Maintaining as much of the tree canopy as possible will be critical to minimize a rise in the water temperature of Jabez Branch. Sediment and erosion control will be implemented to also limit impacts from acidic soils. During construction, monitoring the acidity of Jabez Branch may be necessary. A closed section may be used to capture the runoff from entering directly into the Jabez Branch for both MD 3 and relocated Charles Hall Road.

8. Additional Avoidance and Minimization Efforts

As part of the development of the SHA Selected Alternate, several avoidance and minimization efforts have been introduced throughout the study corridor in an effort to avoid or minimize the impacts to the natural environment. Avoidance and minimization efforts include, but are not limited to changes to the horizontal and vertical alignments, typical section modifications, bridge lengths, and retaining walls. Where possible, the existing alignment and pavement area for MD 3 has been utilized to minimize additional impacts throughout the corridor. For sections in which mainline MD 3 is dualized, the median width varies to match the existing roadway where possible, and elsewhere the median has been minimized to avoid natural environmental features.

Where feasible and reasonable, the horizontal alignment and vertical alignment for mainline MD 3 and the interchange options have been shifted to avoid impacts to the natural environment, particularly the wetland areas along the study area in the MD 450 area.

The through lanes have been reduced to 11-foot lanes from 12-foot lanes in an effort to better control the vehicle speeds throughout the corridor. This lane reduction also contributes to a smaller typical section footprint for mainline MD 3. In addition, a 2 to 1 outside grading slope has been used where natural environmental features have been identified in the study area. For the remainder of the corridor a 4 to 1 outside grading slope has been used to tie-in with the existing ground.

To avoid impacts to the confluence of the Patuxent and Little Patuxent Rivers, all new roadways have been proposed to the east of MD 3. Minor widening has been shown to the west of the existing roadway. The bridge lengths identified for the crossing of the Patuxent River will be as long as or longer than the existing MD 3 structures. This is an effort to ensure that the upstream hydrology is not affected by the SHA Selected Alternate.

In addition to the decreased grading slopes, where feasible, retaining walls have been introduced to all of the interchange options and throughout the study corridor to minimize the area of impact to the natural environment throughout the study area.

D. HAZARDOUS MATERIALS/WASTE IMPACTS

1. Potential Hazardous Site Impacts

Several inventoried hazardous materials may be impacted by the SHA Selected Alternate (**Table IV-13**). Depending on the design and depth of required grading, subsurface water conveyance structures and foundations, contaminated media (soil, groundwater), and in-place Underground Storage Tanks (USTs) could potentially be impacted. These USTs typically hold fuels or other petroleum products. Further investigation into the specific location of reported permanently out-of-use USTs in relation to proposed MD 3 construction activities will need to be conducted before the property is purchased and construction is initiated.

**Table IV-13
Impacts to Hazardous Wastes Sites**

Site #	Name	Risk Ranking	Impact Type
1A	Suburban Propane	Low	Minimal Property Impacts*
6	Phillips 66	Medium High	Minimal Property Impacts*
10	Waugh Chapel Texaco	High	Displacement
12	Crofton Animal Hospital	Medium/High	Minimal Property Impacts*
13A	Exxon	Medium/High	Displacement
13C	Waugh Chapel Fire Co.	Medium	Minimal Property Impacts*

Site #	Name	Risk Ranking	Impact Type
14	7-Eleven	Medium	Minimal Property Impacts*
15	Mobil Oil Corp	Medium/High	Minimal Property Impacts*
16A	Storch Property Pumping Station	Medium	Displacement
19B	Crofton Station Amoco	Medium/High	Displacement
29C	Chevron Station	Medium/High	Displacement
29D	Belair Texaco (currently Belair Shell)	Medium / High	Displacement
32	Bowie Motor Company	High	Minimal Property Impacts*

**See discussion below for more detail regarding impacts.*

a. Potentially Impacted Sites

The sites that may be potentially impacted by the SHA Selected Alternate are discussed below. Identification of these sites was based on the database review provided by Environmental Data Resources, Inc. (EDR) and by field reconnaissance.

Suburban Propane, Low Risk, Site #1A

Suburban Propane was not listed in the EDR database but was added as a result of the field reconnaissance. This facility, located in the MD 3 median just north of MD 175, contains several large above ground propane storage tanks.

Former Phillips 66, Medium/High Potential Risk, Site # 6

The Phillips 66 Number 17003 site is located south of MD 175. This site has four permanently out of use USTs that are assumed to still be at the site. Based on observation made during the site reconnaissance, the property is currently utilized for residential use. An old kerosene pump was observed on the east side of the existing building.

The SHA Selected Alternate would impact a small portion, less than 0.24-acre, of the property's parking lot, but it is not anticipated that the SHA Selected Alternate would impact the USTs.

Former Waugh Chapel Texaco, High Potential Risk, Site # 10

The Waugh Chapel Texaco site is located at 908 MD 3 South. There are four USTs in use and one permanently out-of-use UST at the Texaco site. There is also a 24-hour remediation system on-site, which suggests that soil and or groundwater contamination has been detected at this property and that steps are being taken to clean up the site.

Because major improvements are planned for the intersection at Waugh Chapel Road and MD 3, this property will be displaced for the SHA Selected Alternate. It is not anticipated that the SHA Selected Alternate would impact the USTs.

Crofton Animal Hospital, Medium/High Potential Risk, Site # 12

The Crofton Animal Hospital was located at 1044 MD 3 North. EDR reports that the site is listed in Oil Control Program Cases (OCPCASES) with a closed facility status. Even though this site is “closed”, residual and previously unidentified contamination could exist at the property. Therefore, this site is listed as Medium/High Potential Risk. The SHA Selected Alternate would require acquisition of a small grassed area (0.17 acre) on the eastern portion of the property. Further investigation into the specific location of the OCPCASES in relation to proposed MD 3 construction activities will need to be conducted at this site before construction is initiated.

Exxon, Medium/High Potential Risk, Site # 13A

EXXON Number 27152 site is located at 893 northbound MD 3. The EDR report shows that four USTs are currently in use and two USTs are permanently out of use at the EXXON site. The property would be displaced by the SHA Selected Alternate.

Waugh Chapel Fire Department, Medium Potential Risk, Site #13C

The Waugh Chapel Fire Department is located at 1300 Waugh Chapel Road. The EDR report lists the site as having two OCPCASES, both with a closed facility status, and three permanently out of use USTs (for diesel, gasoline, and heating oil).

The SHA Selected Alternate would impact a small portion of the property. Impacts to the USTs are not expected.

7-Eleven, Medium Potential Risk, Site # 14

The 7-Eleven site is located at 1044 MD 3, within the median of MD 3. The EDR report states that there are three USTs in use at the 7-eleven site. No UST violations have been reported.

The SHA Selected Alternate would impact 0.19 acres of the property. It is not anticipated that the USTs would be impacted by this alternate.

Mobil Oil Corp, Medium/High Potential Risk, Site # 15

The Mobil Oil Corporation SS Number KE5 site is located at 1025 MD 3 North. The EDR report lists five USTs in use at this property. No UST or RCRIS violations have been reported.

The SHA Selected Alternate would require acquisition of a small western portion of the property, less than 0.11 acre (mainly grass ground cover).

Storch Property Pumping Station, Medium Potential Risk, Site # 16A

The Storch Property Pumping Station is located at 895 MD 3 North. The EDR report states that no UST violations have been reported.

The SHA Selected Alternate would require displacement of this property.

Crofton Station AMOCO, Medium/High Potential Risk, Site # 19B

The Crofton Station AMOCO site is located at 1156 northbound MD 3. The EDR report lists four USTs in use at this property. No UST or RCRIS violations have been reported. Recently, however, a significant amount of free petroleum product has been detected in the subsurface soil (a depth of approximately 10-20 feet) and active remedial activities (removal of free petroleum product) are occurring on an intermittent basis.

The SHA Selected Alternate would require property acquisition, less than one acre, of the gas station property.

Chevron Station, Medium/High Potential Risk, Site # 29C

High Tech Amoco (7110 Crain Highway) is located on the west side of MD 3 at the MD 3/MD 450 intersection. According to available information reported by EDR, Hi-Tech Amoco/Amoco Gas is listed as having ten "out of use" and five "in use" USTs. It appears that the USTs listed as "out of use" are still located at the site and have not been removed. Hi-Tech Amoco/Amoco Gas is also listed in the RCRIS database as a small quantity generator (SOQ) of hazardous waste. This property will be displaced by the SHA Selected Alternate.

Belair Texaco, (currently Belair Shell Gas Station) Medium/High Potential Risk, Site # 29D

The Belair Texaco (currently Belair Shell) is located at 7111 Crain Highway east of MD 3 at the MD 3 / MD 450 intersection. The Belair Texaco is reported to have eight USTs "in-use", four "out-of-use" USTs, which are assumed to be still located at the site and have not been removed, and five USTs that have been removed from the site.

This property will be displaced by the SHA Selected Alternate.

Bowie Motor Company, High Potential Risk, Site # 32

The Bowie Motor Company site is located at 6501 N Crain Highway. During the site reconnaissance two above ground waste oil tanks were observed with a significant amount of oil staining on the ground near the tanks east of the Bowie Motor Company buildings. Automobile, truck and heavy equipment storage was also observed in the area behind the main buildings. It appears that Bowie Motor Company leases space to several entities that park automobiles, trucks and other heavy equipment on the property. Based on observations and the amount of soil staining observed, it appears that these entities also perform maintenance on automobiles, trucks and other heavy equipment that are parked in this area.

The SHA Selected Alternate would impact approximately 0.23 acre of the Bowie Motor Company property fronting southbound MD 3 and 0.41 acre of property fronting northbound MD 3, forming a total impact area of 0.64 acre.

There are other sites within the study area that have a high or medium high potential for environmental concern but are not directly impacted by the proposed project. However, efforts will be made to identify sites of potential environmental concern at these nearby properties should changes to the SHA Selected Alternate occur during engineering design. Detailed descriptions of these properties are included in the **MD 3 Initial Site Assessment Report**.

2. Recommendations

An Initial Site Assessment in general conformance with the applicable scope and limitations of ASTM Practice E 1527-00 was conducted for the study area. The following is a summary of findings and conclusions:

The proposed project will require acquisition of right-of-way that includes several properties that contain documented potentially hazardous substances. From the 48 sites that were identified by the EDR report and the field visit, then reviewed and ranked within the study area, at least 13 sites may have the potential to be impacted by the proposed project. Since the designated limits of work are preliminary, there exists the potential that other properties may be impacted by the project, and that such properties will be identified during final design.

Of the 13 potentially impacted sites, nine are ranked as having a high or medium/high potential for environmental concern based on the hazardous ranking criterion. Further investigations of the sites listed above as to the exact locations of USTs and the potential for soil or groundwater contamination would be required prior to acquisition of these properties for right-of-way. The exact limits of work have not been defined and not all of the sites listed above may be displaced by the proposed alignments. Final design of the SHA Selected Alternate will take into consideration the properties listed above in order to minimize risk of encountering contaminated soil and groundwater during construction.

E. AIR QUALITY

1. Methodology

An air quality impact assessment was conducted to determine if the MD 3 Project Planning Study Build Alternates meet the requirements of the federal Clean Air Act (CAA). The complete analysis is documented in the **MD 3 Air Quality Analysis Report**, published separately and was submitted to the Air and Radiation Management Administration of the MDE and the EPA.

a. Motor Vehicle Emission Factors

Prepared in accordance with federal and state guidelines, the air quality analysis consisted of carbon monoxide (CO) “hot-spot” dispersion modeling. This was conducted in the vicinities of the several interchanges and intersections along the project corridor, including MD 3/MD 450 (East & West), MD 3/MD 424 and MD 3/MD 175. Regional impacts to air quality were assessed in accordance with the CAA Transportation Conformity Rule.

Traffic data for the air quality analysis were derived from traffic counts and other information developed as part of an overall traffic analysis for the project completed by SHA for the year 2000 (Note: These volumes were verified as part of a 2009 traffic sensitivity analysis and approved by FHWA for use in this document). Both AM and PM peak traffic periods were evaluated. **Table IV-14** shows the intersections along MD 3 that were evaluated as possible “hot-spot” analysis areas.

**Table IV-14
Intersections Evaluated for “Hot-Spot” Analyses.**

MD 3 Intersection	LOS (V/C)		Volume	
	AM Peak	PM Peak	AM Peak	PM Peak
MD 450 East (Defense Hwy) ¹	E(0.96)	F(1.11)	5,940	7,105
MD 450 West (Annapolis Rd) ¹	E(0.91)	F(1.06)	6,115	7,095
MD 175 (West) ¹	E(0.95)	F(1.00)	6,470 ²	6,285 ²
MD 175 (East) ¹	F(1.07)	E(0.95)		
MD 424 & Conway Rd ¹	E(0.96)	E(0.98)	5,800	6,250
Cronson & Crawford Blvds	E(0.94)	E(1.00)	5,275	5,830
Waugh Chapel & Reidel Rds	D(0.88)	D(0.88)	6,025	6,240
John Hopkins Rd (West)	D(0.88)	A(0.60)	5,715 ²	5,850 ²
John Hopkins Rd (East)	C(0.77)	C(0.77)		
Waugh Chapel Shopping Center	B(0.64)	B(0.70)	4,955	5,095
St. Stephen’s Church Rd (West)	D(0.84)	D(0.84)	5,415 ²	5,290 ²
St. Stephen’s Church Rd (East)	C(0.76)	B(0.71)		

Source: Maryland State Highway Administration, 2002.

¹ Intersections chosen for hot-spot analysis

² Volume combines west and east

For this analysis, the worst case conditions were simulated as the afternoon (PM) peak hour at the MD 3/MD 450 and MD 3/MD 424 intersections. Worst case conditions at MD 3/MD 175 were simulated as the morning (AM) peak hour.

For the hot-spot analysis, motor vehicle emission factors for CO were computed from the MOBILE6 version of the U.S. EPA MOBILE emissions model. Appropriate input parameters (i.e. fleet mix, age distribution, emission control programs, etc.) were obtained from MDE. The U.S. EPA-approved CAL3QHC atmospheric dispersion model for roadways was used to predict CO concentrations. As a conservative approach, “worst-case” meteorological and traffic conditions were analyzed and appropriate background CO levels were added to the results for the years 2000 and 2025. **Table IV-15** shows the percentage of vehicles by type. The MOBILE6 computer program input and output files are included in the **MD 3 Air Quality Analysis Report**.

**Table IV-15
Vehicle Mix Information for MOBILE6**

Vehicle Type	Fleet Percent
Light Duty Gas Vehicles	47.2
Light Duty Diesel Vehicles	0.1
Medium Duty Gas Trucks	39.7
Medium Duty Diesel Trucks	0.5
Heavy Duty Gas Vehicles	3.5
Heavy Duty Diesel Vehicles	8.6
Motorcycles	0.5

Table IV-16 contains the emission factors obtained from the MOBILE6 program used for the dispersion modeling analysis.

**Table IV-16
MOBILE6 Carbon Monoxide (CO) Emission Factors**

Application	Speed (mph)	2000 Emission Factors (g/hour or g/mile)	2025 Emission Factors (g/hour or g/mile)
All	Idle	145.9 ¹	53.5 ¹
Ramps	25	n/a	9.8
MD 450, MD 424, MD 175	35	21.9	9.3
MD 3	45, 50 ²	22.5, 23.1	9.6

Source: MOBILE6 model output, 2003.

Notes: Vehicle speeds were modeled at 5 mph less than the posted speed limit.

¹ Idle emission factors are in units of g/hour

² 50 mph was used only for southbound MD 3 for the year 2000

b. CAL3QHC Dispersion Model Analysis

CAL3QHC is an EPA-approved "micro-scale" atmospheric dispersion computer model that combines roadway design and operational parameters, motor vehicle emission factors and meteorological conditions to predict pollution concentrations at specified receptor locations along roadways, interchanges or intersections. The most recent version of CAL3QHC program (Version 95221) was used for this analysis along with the Lakes Environmental CALRoads View (version 2.2) software program.

Based on the *User's Guide to CAL3QHC version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections* the following meteorological conditions and input parameters were used:

- Stability Class: D (stable atmosphere)
- Wind Speed: 1 m/s
- Wind Directions: 36 wind directions in 10° increments, then refined to 1°
- Mixing Height: 1000 m
- Surface Roughness: 108 cm
- Saturation Flow Rate: 1800 vehicles/hour

The vehicle speeds were based on five mph below the posted speed limit of the individual roadway segments. Signal timing information was obtained from the SHA (see memo in **Appendix C**). It is based on actuated phases with an average progression arrival rate.

Receptors

As a general rule, receptors should be located where the maximum total project concentration is likely to occur and where the public will have access. Maximum concentrations are expected to occur in the vicinity of signalized intersections/interchanges.

A total of 42 receptor locations were analyzed for the MD 3/MD 450 intersection with 21 receptors placed at each MD 450 West and MD 450 East. A total of 28 receptors were analyzed for the MD 3/MD 424 intersection and 54 receptors were analyzed for MD 3/MD 175. Receptor locations were placed approximately 20 feet from modeled roadway links. Receptor were placed (25 – 50 yards apart) at MD 3/MD 450 West intersection, the MD 3/MD 450 East intersection, the MD 3/MD 424 intersection, and the MD 3/MD 175 intersection. Since the location of the receptors along the roadways are closer than any sensitive receptor (i.e., residence, building entrance, schools, etc.) location would be, it was determined that additional receptors were not necessary, as the highest concentrations are usually located closer to the roadways.

Background Levels and Persistence Factor

In order to determine the ambient CO concentration for the receptor closest to the highway project, two concentration components were used: local and background. The local concentration is defined as the CO emissions from motor vehicles operating on highways in the near vicinity of the receptor location. The background concentration is defined as the concentration of a pollutant at a point that is the result of emissions outside the local vicinity; that is, the concentration at the upwind edge of the local sources.

Based on direction from the MDE, and approved by EPA, a value of six parts per million (ppm) was used as background for the one-hour concentration and four ppm was used as background for the eight-hour concentration.

Peak eight-hour concentrations of CO were obtained by multiplying the highest peak hour CO estimates by a persistence factor of 0.7. This factor, recommended by MDE and approved by EPA, takes into account that over eight hours vehicle volumes will fluctuate downwards from the peak, vehicle speeds may vary and meteorological conditions will vary as compared to the very conservative assumptions used for the single hour analysis.

Future CO Dispersion Model Results

CO levels were estimated at 3 intersections along the MD 3 study area using the CAL3QHC model. Several model runs were completed to provide the summary of results shown in the tables below. Preliminary runs were done to determine the maximum impact based on 10° increments. Then refined analyses of 1° increments +/- 10° around the maximum concentration were completed. The results of the CO dispersion modeling for the proposed MD 3 project are summarized in **Table IV-17** for the future-year (2025) Build scenario. The tabled values reflect the highest predicted levels based on future travel demand and possible meteorological conditions. The dispersion analysis was performed for the one-hour worst-case condition. The corresponding worst-case eight-hour CO concentrations were calculated by applying a persistence factor of 0.7 to the predicted one-hour concentrations. Background CO concentrations were also added to the modeled one-hour and eight-hour results.

As shown in **Table IV-18**, the maximum modeled CO concentrations for the 2025 Build scenario in the vicinity of the MD 3/MD 450 West interchange are 7.6 ppm for the one-hour averaging period and 5.1 ppm for the eight-hour averaging period, occurring at Receptor 1 from a wind direction of 128°-129°. For MD 3/MD 450 East, the maximum modeled CO concentrations were 8.7 ppm for the one-hour averaging period and 5.9 ppm for the eight-hour averaging period, occurring at Receptors 29 and 30 from multiple wind directions between 216°-223°.

The maximum predicted CO concentrations for the 2025 Build Scenario occur in the vicinity of the MD 3/MD 424 interchange are 9.3 ppm for the one-hour averaging period and 6.3 ppm for the eight-hour averaging period, occurring at Receptor 18 at wind angles between 343°-357°. For MD 3/MD 175, the maximum modeled CO concentrations were 9.1 ppm for the one-hour averaging period and 6.2 ppm for the eight-hour averaging period, occurring at Receptors 22 and 32 from multiple wind directions between 231°-237°.

Table IV-17
Maximum Modeled CO Concentrations* for the 2025 Build Scenario

Location	1-Hour Concentration (ppm)	8-Hour Concentration (ppm)
MD 3/MD 450 West	7.6	5.1
MD 3/MD 450 East	8.7	5.9
MD 3/MD 424	9.3	6.3
MD 3/MD 175	9.1	6.2
NAAQS	35	9

Source: CAL3QHC model output.

* Maximum concentrations include background CO levels of 6.0 ppm for the 1-hour concentration and 4.0 ppm for the 8-hour concentration.

Based on these results, the planned improvements to MD 3 are not expected to cause or contribute to a violation of the NAAQS for CO.

CO Dispersion Model No-Build Results

These same intersections were modeled for the 2000 and 2025 No-Build scenarios. They were also modeled using the CAL3QHC and MOBILE6 models. The modeled CO concentrations for the 2025 No-Build conditions are below the National Ambient Air Quality Standards (NAAQS) of 9.0 ppm and are summarized in **Table IV-18**. As a comparison, the No Build Scenario for 2000 was also analyzed (see **Table IV-19**). The modeled CO concentrations for the 2000 No-Build conditions due not exceed the NAAQS.

Table IV-18
Maximum Modeled CO Concentrations* for the 2025 No-Build Conditions

Location	1-Hour Concentration (ppm)	8-Hour Concentration (ppm)
MD 3/MD 450 West	9.5	6.5
MD 3/MD 450 East	10.0	6.8
MD 3/MD 424	8.9	6.0
MD 3/MD 175	8.7	5.9
NAAQS	35	9

Source: CAL3QHC model output.

* Maximum concentrations include background CO levels of 6.0 ppm for the 1-hour concentration and 4.0 ppm for the 8-hour concentration.

Table IV-19
Maximum Modeled CO Concentrations* for the 2000 No-Build Scenario

Location	1-Hour Concentration (ppm)	8-Hour Concentration (ppm)
MD 3/MD 450 West	12.1	8.3
MD 3/MD 450 East	13.1	9.0
MD 3/MD 424	11.3	7.7
MD 3/MD 175	10	6.8
NAAQS	35	9

Source: CAL3QHC model output.

*Maximum concentrations include background CO levels of 6.0 ppm for the 1-hour concentration and 4.0 ppm for the 8-hour concentration.

c. Model Analysis Conclusion

Results from both the Level of Service analysis and the CAL3QHC dispersion modeling analysis indicate that the proposed changes to MD 3 could be built and operated such that traffic CO emission levels at the nearby intersections would not cause an exceedance of the CO NAAQS. Based on these model runs, both the one-hour and eight-hour modeled concentrations at the MD 3 intersections with MD 450, MD 424 and MD 175 are below the NAAQS for CO and all areas are considered to be in compliance.

2. Predicted Results

No violations of the applicable State and NAAQS are expected from this project. The MD 3 project is part of numerous planned improvements within the Baltimore metropolitan region as listed in the 2007 Baltimore Regional Transportation Plan (BRTP). A conformity determination of the BRTP and the 2008-2012 Transportation Improvement Programs (TIP) with the Attainment Plan goals for the region was based on an analysis of emissions from implementation scenarios associated with projects contained in the BRTP and TIP.

The Prince George's County portion of this project is located in the Washington, DC-MD-VA PM_{2.5} nonattainment area, and the Anne Arundel County portion of this project is located in the Baltimore, MD PM_{2.5} nonattainment area. Both of these areas were designated as nonattainment for PM_{2.5} on January 5, 2005 by the EPA. This designation became effective on April 5, 2005, 90 days after EPA's published action in the Federal Register. Transportation conformity for the PM_{2.5} standards applied on April 5, 2006, after the one-year grace period provided by the Clean Air Act.

Projects that require hotspot analysis for PM_{2.5} are those projects that are *projects of air quality concern* as enumerated in 40CFR93.123 (b)(1):

- (i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;

- (ii) Projects affecting intersections that are at level-of-service D, E, or F with a significant number of diesel vehicles, or those that will change to level-of-service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- (iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
- (iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and
- (v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM₁₀ or PM_{2.5} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

3. Analysis of the Proposed Improvements

- The MD 3 project does not meet the criteria set forth in 40 CFR 93.123(b)(1) as amended to be considered a *project of air quality concern* primarily because the project is an expansion of an existing highway primarily used by gasoline vehicles.
- The primary current north-south truck route in the area is I-97. This route is signed as a through route for trucks, while the MD 3 project is signed for local trips. An Origin/Destination study performed for the project determined that only 29 percent of all trucks entering the study corridor north of MD 175 continued southbound towards US 301 or US 50 during peak period. The remaining 71 percent of trucks were either beginning or ending their trips within the study area. In addition, the MD 3 truck survey showed only 32 percent of all northbound trucks entering the study corridor south of MD 450 continued past MD 175.
- As discussed in the examples to the preamble to the March 10, 2006 Final Rule for PM_{2.5} and PM₁₀ Hot-Spot Analyses in Project-Level Transportation Conformity Determinations (71FR12491), for projects involving the expansion of an existing highway, 40 CFR 93.123(b)(1)(i) has been interpreted as applying only to projects that would involve a significant increase in the number of diesel transit buses and diesel trucks on the existing facility. This is consistent with 40 CFR 93.123(b)(1)(iv) which defines projects of air quality concern based on a significant increase in diesel vehicles due to terminal or transfer project expansion. As shown in **Table IV-20** and discussed below, the Build traffic volumes and truck percentages are essentially equal to the No-build traffic volumes and truck percentages indicating that there will not be a “significant increase” in the number of trucks.
 - Existing (2000) Average Daily Traffic (ADT) volumes vary from 52,000 to 67,000 vehicles/day (v/d) depending on location within the study, with the highest volume occurring between the two MD 450 intersections. Approximately 67,125 v/d travel on this section of MD 3 between MD 450 West (Annapolis Road) and MD 450 East (Defense Highway) compared to 52,750 v/d on the section just south of the Waugh Chapel/Riedel Road intersection. Truck traffic ranges from 9 to 16 percent of the 2000 ADT depending on location within the study, with the heaviest truck volume north of MD 450 and south of Waugh Chapel Road.

- The ADT on MD 3 within the study area is projected to increase by 25 to 28 percent between 2000 and 2011 depending on location within the study. For 2011, the forecasted volumes range from 68,850 v/d at the Waugh Chapel Shopping Center entrance to 84,600 v/d between MD 450 West and MD 450 East. Truck traffic ranges from 9 to 16 percent of the 2011 ADT depending on location within the study, with the heaviest truck volume north of MD 450 and south of Waugh Chapel Road.
- The ADT on MD 3 within the study area is projected to increase by 57 to 61 percent from 2000 to 2025 depending on location within the study. For 2025, the forecasted volumes range from 86,100 v/d at the Waugh Chapel Shopping Center entrance to 105,375 v/d between MD 450 West and MD 450 East. Truck traffic ranges from 9 to 16 percent of the 2025 ADT depending on location within the study, with the heaviest truck volume north of MD 450 and south of Waugh Chapel Road (see **Table IV-20**).
- Traffic analysis was completed using an 'unconstrained' network, which means that the analysis determined what the 2025 traffic volume forecasts would be based on the rezoning that has occurred within the Odenton/Crofton/Bowie Small Area Plans and general growth, regardless of the existing roadway capacity. In some locations for the No-Build scenario, the volume to capacity ratio was over 1.40, which indicates that major delays occur with possible peak spreading. When those same forecast traffic numbers were applied to the Build scenarios, at some locations the previously failing intersections operate at a better level-of-service, therefore creating a more desirable traffic pattern. The slight decrease in the number of vehicles at some locations, possibly resulted because vehicles that had been taking cut through routes parallel to MD 3, and are included in the through or turn movements where the volumes have increased.

Table IV-20
2000, 2011 and 2025 ADT

Intersection with MD 3	Truck Percent	Year 2000	Year 2011	Year 2011	Year 2025	Year 2025
		“Existing” Conditions MD 3 ADT	No-Build Conditions MD 3 ADT	Build Conditions MD 3 ADT	No-Build Conditions MD 3 ADT	Build Conditions MD 3 ADT
MD 450 West (Defense Highway)	11	67,125	84,650	84,600	105,375	105,300
MD 450 East (Annapolis Road)	15	67,125	84,650	84,600	105,375	105,300
Cronson Boulevard	15	57,925	74,025	74,025	93,025	93,025
MD 424	9	56,475	71,750	70,850	90,275	90,250
Waugh Chapel Shopping Center	16	54,200	68,850	68,850	86,100	86,100
Waugh Chapel Road / Riedel Rd.	16	56,325	71,950	71,950	90,575	90,575
St. Stephen's Church Road	12	57,400	73,025	73,025	91,675	91,675
MD 175 / Millersville Road	12	57,400	73,025	73,025	91,675	91,675

- Section 176(c) of the CAA and the federal conformity rule require that transportation plans and programs conform to the intent of the SIP through a regional emissions analysis in PM_{2.5} nonattainment areas. The Prince George's County portion of this project is located in the Washington (DC-MD-VA) PM_{2.5} nonattainment area and the Anne Arundel County portion of this project is located in the Baltimore, MD PM_{2.5} nonattainment area. (NOTE: EPA has updated the entire State of Maryland designation classification to “Attainment/Unclassifiable” for the 2006 24-hour PM_{2.5} Standards as of October 8, 2009).
 - The Prince George's County portion of the MD 3 Project, from US 50 to the Anne Arundel County Line, is under the Metropolitan Washington Council of Governments (MWCOC) jurisdiction, which approved the project in its regional conformity model. The National Capital Region Transportation Planning Board (NCRTPB) July 2009 Constrained Long Range Transportation Plan (CLRP) and the 2009-2014 TIP have been determined to conform to the intent of the SIP. The US Department of Transportation made a PM_{2.5} conformity determination on the 2009 CLRP and the 2009-2014 TIP on July 15, 2009, and thus there is a currently conforming transportation plan and TIP in accordance with 40 CFR 93.114. The MD 3 project from US 50 to the Anne Arundel County Line was included in the regional emissions analysis as ID #MP2c, and there have been no significant changes in the project's design concept or scope, as used in the conformity analyses. In addition, on November 17, 2010, the NCRTPB approved and adopted the 2010 Financially CLRP and associated Air Quality conformity Assessment which was approved by FHWA on February 9, 2011. Thus, this portion of the project comes from a conforming plan and program in accordance with 40 CFR 93.115.
 - The Anne Arundel County portion of the MD 3 project from MD 32 to the Prince George's County Line is under the jurisdiction of the BRTP, the federally recognized Metropolitan Planning Organization for transportation planning in the Baltimore region. Members of the Baltimore Metropolitan Council (BMC) Board serve on the BRTP, and the BMC provides technical and staff support to the BRTP. The 2007 BRTP “Transportation Outlook 2035” and the FY 2008-2012 TIP have been determined to conform to the intent of the SIP¹. The US Department of Transportation made a PM_{2.5} conformity determination on the 2007 BRTP and the FY 2008-2012 TIP on July 28, 2009, and thus there is a currently conforming transportation plan and TIP in accordance with 40 CFR 93.114. The MD 3 Project from MD 32 to the Prince George's County Line was included in the regional emissions analysis as TIP ID #61-0105-41, and there have been no significant changes in the project's design concept or scope, as used in the conformity analyses. Therefore, this portion of the project comes from a conforming plan and program in accordance with 40 CFR 93.115.
- Based on review and analysis, it was determined that the MD 3 project meets the CAA and 40 CFR 93.109 requirements. These requirements are met for fine particulate matter without a project-level hot-spot analysis, since the project has not been found to be a project of air quality concern as defined under 40 CFR 93.123(b)(1). Since the project meets the CAA and

¹ Conformity Determination of the 2004 Baltimore Regional Transportation Plan and the FY 2007-2011 Transportation Improvement Program, Baltimore Regional Transportation Board (BRTB), August 2006.

40 CFR 93.109 requirements, the project will not cause or contribute to a new violation of the PM_{2.5} NAAQS, or increase the frequency or severity of a violation.

- By email dated March 19, 2007 the above analysis was approved by FHWA and forwarded to EPA, MDE, MWCOG and BRTB for Interagency Consultation. On March 20, 2007 email approvals were received from EPA and MDE. On March 22, 2007 email approval was received from BRTP (BMC). FHWA, EPA and BRTP agreed that the MD 3 Project is not a project of air quality concern as defined in 40 CFR 93.123(b)(1), and therefore, a project level hot-spot analysis is not required. No other comments were received from Interagency Consultation.

Since it was determined that the MD 3 improvements would not be a project of air quality concern, an opportunity for public comment on the PM_{2.5} conformity determination was provided through a 15 day posting on the SHA project website. No comments were received during this 15 day comment period, which began March 23, 2007 and ended April 9, 2007.

FHWA *Guidance on Air Toxic Analysis in NEPA Documents*², requires analysis of Mobile Source Air Toxics (MSAT) under specific conditions. The EPA has designated six prioritized MSATs, which are known or probable carcinogens or can cause chronic respiratory effects. The six prioritized MSATs are: Benzene; Acrolein; Formaldehyde; 1,3-Butadiene, Acetaldehyde; and Diesel Exhaust (Diesel Exhaust Gases and Diesel Particulate Matter). The MD 3 project, which has a maximum design year (2025) ADT of 105,375, would be considered in the category: "**Projects with Low Potential MSAT Effects.**" As described in the referenced guidance an example of this type of project is a minor widening project, where design year traffic (AADT) is not projected to exceed 150,000. Projects in this category may require a qualitative MSAT analysis. In addition, per SHA traffic analysis the Build traffic volumes (ADT) and truck percentages are essentially equal to the No-build traffic volumes (ADT) and truck percentages. Therefore this project would be a project "*that serves to improve operations of highway.....without adding substantial new capacity or creating a facility that is likely to meaningfully increase emissions*"³

As discussed, the MD 3 project will not result in any meaningful changes in traffic volumes, vehicle mix, or any other factor that would cause an increase in emissions impacts. As such, FHWA has determined that this project will generate minimal air quality impacts for the CAA criteria pollutants and has not been linked with any special MSAT concerns. However, since the previously prepared environmental studies for the MD 3 project did not include a discussion of MSAT, a qualitative MSAT analysis is necessary.

Included herein is a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the Build Alternative. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

² Interim Guidance on Air Toxic Analysis in NEPA Documents, FHWA, February 2006

³ *ibid.*

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. The tools to predict how MSATs disperse are also limited. Even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude reaching meaningful conclusions about project-specific health impacts. Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses. The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants.

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions-if any-from the Build Alternative.

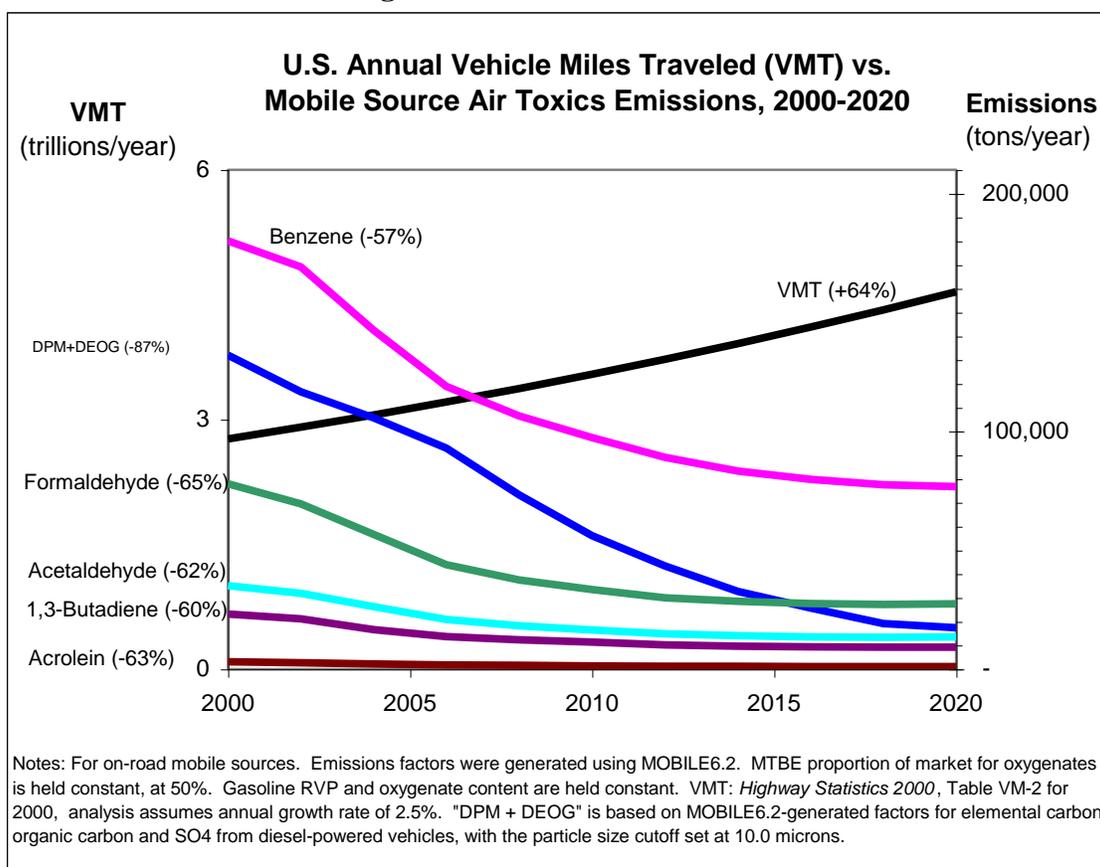
For the SHA Selected Alternate, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT. The VMT estimated for the SHA Selected Alternate may be slightly greater than that of the No-Build, because the SHA Selected Alternate may attract additional trips from elsewhere in the transportation network. The increase in VMT would lead to slightly higher MSAT emissions along the MD 3 project for the SHA Selected Alternate, along with a corresponding decrease in MSAT emissions for adjacent routes and local roads. The emissions increase due to increased VMT is offset somewhat by lower MSAT emission rates due to increased speeds, since according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs, except for diesel particulate matter, decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

The project improvements contemplated as part of the SHA Selected Alternate will have the effect of moving some traffic closer to nearby homes and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be higher under the SHA Selected Alternate than the No-build Alternate. The localized increases in MSAT concentrations would likely be most pronounced along the side where the expanded roadway shifts towards the

residences. This varies throughout the project. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-Build Alternate cannot be accurately quantified due to the inherent deficiencies of current models.

In summation, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the SHA Selected Alternate could be higher relative to the No-Build Alternate, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. Furthermore, at both the project location and regionally, MSAT concentrations will decrease in future years due to EPA's vehicle emission and fuel regulations. Refer to **Figure IV-9**.

Figure IV-9: VMT vs. MSATs



F. NOISE

1. Impact Analysis

An impact analysis was performed in compliance with recommended FHWA and SHA methodologies. Noise abatement criteria for various land uses have been established by the FHWA in 23 CFR, Part 772. The noise abatement criteria for land uses occurring in the study

area, (Category B: picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals) is 67 dBA Leq. Future year 2025 noise levels for the project area were predicted using the FHWA Traffic Noise Prediction Model (TNM).

According to the procedures described in 23 CFR, Part 772, Table I, noise impacts occur when predicted traffic noise levels for the design year approach or exceed the noise abatement criterion prescribed for a particular land use category, or when the predicted noise levels are substantially higher than the existing ambient noise levels. The SHA and FHWA define approach as 66 decibels (dBA) for Category B, and uses a 10 dBA increase to define a substantial increase. This analysis was completed in accordance with Federal procedures and evaluated in accordance with SHA's Sound Barrier Policy.

The SHA Sound Barrier Policy provides for the evaluation of sound barriers for communities adversely impacted by noise from state highways. Sound barriers are evaluated in two separate categories. The first category is for the construction of new highways or capacity additions to existing highways (Type I). The second category is for existing highways not being expanded (Type II). The proposed improvements for MD 3 would be considered a Type I project.

An impact analysis was performed for the SHA Selected Alternate for those locations in which capacity may increase as result of the proposed alternates. Therefore, noise impact analyses were completed for the section of MD 3 from US 50 to MD 450 and from St. Stephens Church Road to MD 175 because of the increase from two lanes in each direction to three lanes. In addition, the NSAs potentially impacted by the introduction of interchanges in place of intersections at MD 450, Cronson/Crawford Boulevard, MD 424, Waugh Chapel/Reidel Road and MD 175 were analyzed.

Future design year 2025 ambient noise levels were modeled at the monitored and virtual receptor sites using FHWA's Traffic Noise Model Version 2.1. A total of 15 residential NSAs (NSAs 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16, 17, 19, and 20) experienced noise levels equal to or exceeding the 66 dBA criteria. A substantial increase of 10 dBA or more was not identified for any of the NSAs throughout the corridor.

2. Analysis of Noise Abatement Measures

The consideration of noise mitigation was based upon the FHWA Noise Abatement Criteria (NAC) and the current SHA Sound Barrier Policy. Abatement measures for minimizing noise impacts may be warranted in those areas where noise levels from the roadway approach or exceed the NAC (66-67dBA), or where noise levels would substantially increase (10dBA or greater) over existing ambient noise levels.

Where warranted as a result of the impact analysis, a detailed analysis of mitigation measures was conducted. Existing natural terrain and designed mitigation features, such as cut sections and/or retaining walls, were incorporated into the analysis.

Decisions on the implementation of noise abatement measures were considered only after careful and thorough consideration of the feasibility and reasonableness, as defined under the current

SHA Sound Barrier Policy, of proposed noise abatement measures. Several factors are evaluated to determine whether noise abatement is feasible:

- Can a noise reduction of at least 3 dBA be achieved at the location(s) warranting abatement?
- Will placement of a noise wall/barrier restrict access to vehicular or pedestrian travel?
- Will construction of a noise wall result in any utility impacts?
- Will construction of a noise wall have an impact upon existing drainage?
- Will impacts occur to Section 4(f) properties?
- Are there other non-highway sources in the area that would reduce the effectiveness of a noise barrier?

Reasonableness is based on a number of factors, including:

- Acceptability of proposed abatement to the impacted and benefited residences.
- A 3 dBA or greater change in design year build noise levels over design year no-build noise levels will result from the proposed highway improvements.
- Experience future noise levels at 72 dBA or above.
- Cost does not exceed \$50,000 per benefited residence.
- The relative size and appearance (aesthetics) of the proposed noise barrier to the receptors protected.
- The control of new noise sensitive development adjacent to state highways in high noise zones at the local level.
- Special circumstances, such as historical significance and/or cultural value.

An effective barrier should, in general, extend in both directions to four times the distance between the receptor and the roadway (source). In addition, an effective barrier should provide a 7-10 dBA reduction in the noise level as a preliminary design goal for “first row” residences. However, any impacted noise receptor, which will receive a 3 dBA or greater reduction, is considered when determining the cost reasonableness of a barrier. SHA will also include all receptors that are not impacted but will receive a 5 dBA or greater reduction from a noise barrier. Cost reasonableness is determined by dividing the total number of impacted receptors in a specified noise sensitive area that will receive a 3 dBA or greater reduction of noise levels and the non-impacted receptors receiving a 5 dBA or greater reduction, into the total cost of the noise mitigation. A total cost of \$34 per square foot is assumed to estimate total barrier cost. This cost figure is based upon current costs experienced by the SHA and includes the costs of panels, footings, drainage, landscaping, and overhead. The SHA has established \$50,000 per benefited residence as being the maximum cost for a barrier to be considered reasonable.

The changes in noise levels resulting between No-Build and Build conditions in the design year 2025 are less than 3 dBA for nine of the residential NSAs (NSAs 3, 5, 7, 9, 12, 13, 17, 19, and 20) impacted. Therefore, mitigation is not considered reasonable at these locations.

Due to the multiple access points along MD 3, no mitigation measures could be applied to receive a minimum 5 dBA or greater reduction as identified in SHA’s Noise Policy for two NSAs (NSAs 4 and 16). In addition, for NSA 11 the calculated noise abatement cost

(\$294,780/benefited residence), is above the SHA criteria of \$50,000 per benefited residence. Therefore, noise abatement is not recommended.

The following is a description of the remaining three impacted areas (NSAs 6, 8, and 15) and the feasibility of noise abatement for each of these impacted NSA. **Table IV-21** summarizes the noise abatement considered and cost per benefited residence.

NSA 6

NSA 6 represents the residential properties east of MD 3 just north of MD 450 to north of Crossgate Drive. The residential properties include portions of Pidgeon House Corner and Crofton Woods communities located off Crossgate Drive. Within NSA 6, two barrier locations were identified for noise mitigation. Separated by Crossgate Drive, these barriers are 1,000 feet and 800 feet long, and 12 feet high. The proposed barriers are located at the top of slope just behind the residential properties within SHA right-of-way. The barriers would protect 24 residences at a total cost of \$734,400. The noise abatement cost per benefited residence is \$30,600, well below the SHA criteria of \$50,000 per benefited residence. Therefore, noise abatement is recommended for NSA 6.

NSA 8

NSA 8 represents the Cedar Grove community, located along northbound MD 3 between Crawford Boulevard and Crofton Boulevard. The original noise analysis, finalized in December 2003, showed that future year levels would reach or exceed 66 decibels (dBA) for the SHA Selected Alternate, warranting consideration of noise abatement. Though a comparison of build versus no-build future noise levels showed a maximum 1-2 dBA increase (depending upon the alternative and receptor location), approximately six residences located on Nutwood Court adjacent to northbound MD 3 would experience future noise levels at 72 dBA or above. Therefore, further consideration of noise abatement for NSA 8 was warranted.

A preliminary analysis of a noise barrier showed that a total of 32 residences would be benefited by a barrier approximately 1,900 feet in length, and ranging in height from 18-22 feet. Based on a unit cost of \$34/sq.ft., the approximately 40,800 square-foot barrier system would cost approximately \$1,387,200 or \$43,350 per benefited residence. Therefore, noise abatement is recommended for NSA 8.

NSA 10

NSA 10 represents the Patuxent River Park property and the Archery Club within the park property on the west side of MD 3 just north of Conway Road. Outdoor activities are limited in the densely wooded park; the Archers Club experiences its seasonal peak attendance between May and September. A telephone conversation on April 16, 2008 with Ed Bowen, Anne Arundel Archers Club President, revealed that the club is comprised of approximately 150-200 members. Peak summertime event and meeting attendance averages 25 members. The park is leased to the club for its specific use as an archery range. Safety precautions are taken prior to shooting events to ensure no people are located within the park. Mr. Bellows noted that the club has not experienced any issues with noise from MD 3 and they not hold events considered to be

noise-sensitive. Mitigation is not warranted at this time based on current land use but will be revisited during design to determine if use has changed. Therefore, additional coordination with park officials and further noise evaluation will continue during the final design stage for this NSA.

NSA 15

NSA 15 represents the single-family residential properties of Canter Farms located on the east side of MD 3 between Reidel Road and St. Stephens Church Road. A noise abatement wall located parallel to northbound MD 3 roadway, 1,150 feet long and 14 feet high would cost \$49,764 per benefited residence. Therefore, noise abatement is recommended for NSA 15. Since the December 2003 Highway Noise Report, the length of this wall was reduced from 1,160 feet to 1,150 feet. Additional studies on the dimensions of the proposed abatement wall will occur during the final design stage.

**Table IV-21
Noise Abatement Analysis and Cost per Benefited Residence**

NSA	Length (ft)	Height (ft)	Area (ft ²)	Cost (\$34/sf)	Benefited Residences	Cost per Benefited Residence
6	1,000	12	12,000	\$408,000	24	\$30,600
	800	12	9,600	\$326,400		
8	1,900	18-22	40,800	\$1,387,200	32	\$43,350
15	1,150	14	16,240	\$547,400	11	\$49,764

Noise abatement is recommended for NSAs 6, 8 and 15, where noise abatement mitigation measures were identified below the SHA criteria of \$50,000 per benefited residence. Further studies will be conducted in final design to determine the most feasible noise abatement mitigation measures.

3. Construction Noise

Land uses that would be sensitive to vehicular noise would also be sensitive to construction noise. Although highway construction is a short-term phenomenon, it can cause significant noise impacts. Additionally, it is likely that some construction may occur at night to avoid severe traffic impacts. The extent and severity of the noise impact would depend upon the phase of construction and the noise characteristics of the construction equipment in use. Construction would have direct impact on receptors located close to the construction site, and an indirect impact on receptors located near roadways whose traffic flow characteristics are altered during construction.

As with any major construction project, areas around the construction site are likely to experience varied periods and degrees of noise impact. This type of project would probably employ the following pieces of construction equipment that would likely be sources of construction noise:

- Bulldozers and earthmovers,
- Graders,
- Front End Loaders,
- Dump Trucks and other diesel trucks, and
- Compressors.

Maintenance of construction equipment will be regular and thorough to minimize noise emissions because of inefficiently tuned engines, poorly lubricated moving parts, poor to ineffective muffling/exhaust systems, etc.

G. VISUAL AND AESTHETIC QUALITY

1. Visual Impacts and Mitigation Measures

The visual impact of a transportation project will vary depending on the existing character of the natural and built environment and the proposed alignment and design. The assessment of impacts the project has on the existing visual character is based on the SHA Selected Alternate. The SHA Selected Alternate will introduce new elements into the visual landscape such as additional lanes, retaining walls and elevated roadway structures, improved at-grade alignments, and pedestrian/bicycle trails.

Visual impacts are likely to be greatest where proposed interchange options introduce overpasses 20 to 30 feet above the existing grade. Such grade separations are proposed at the five major intersection areas under consideration: MD 450, MD 424, Waugh Chapel/Reidel Road, Cronson and Crawford Boulevards and MD 175. Further, visual impacts are more evident where the proposed alignments are near residential communities or wooded areas. Positive visual impacts will occur in areas where proposed alignments are well integrated with the characteristics of the surrounding communities.

Negative impacts will occur in situations where the proposed facilities will detract from or obstruct the view of existing visually sensitive built or natural areas. In areas where negative impacts are anticipated, mitigation measures will be developed in coordination with members from the affected communities. The anticipated visual impacts of the SHA Selected Alternate are discussed below.

a. Mainline

The SHA Selected Alternate includes dualization of MD 3 from Belair Drive to MD 450 with a 16-foot continuous auxiliary lane on the outside from Belair Drive to just north of Forest Drive. Some visual changes will occur as a result of dualization of the current alignment of northbound MD 3 from Belair Drive to MD 450 and upgrades to the existing roadway north of MD 450. These changes will visually impact the existing views to and from the roadway. However, roadway design and landscaping elements sensitive to existing environments will result in a positive outcome that will address mitigation of the visual impacts.

The SHA Selected Alternate includes an additional bridge crossing or reconstruction of the existing bridge over the Patuxent River. The new bridge will be located on the east side of the existing structure and will maintain the profile of the existing bridge. Its appearance will be more open because the rivers are not directly viewed from the roadway. The views from the proposed alignment and bridge will be minimally impacted. In areas where existing high-tension electric lines require cleared area, the SHA Selected Alternate will not change the existing character and visual impacts would be minimal. Coordination with utility companies to avoid conflicts with plantings under or near overhead utility lines will be part of the mitigation measures for visual impacts resulting from the SHA Selected Alternate.

The SHA Selected Alternate visually impacts several communities located within the study area. Sherwood Manor will experience only minor visual impacts, as the wide setbacks and densely wooded area visually isolate the community from MD 3. Also, there is no direct access to and from the community via MD 3.

Pidgeon House Corner and Crofton Woods will experience only minor visual impacts, as the wide setbacks and densely wooded area between the community and MD 3 visually screen the communities. Crofton also has wide setbacks and densely wooded areas between the community and MD 3, which will screen it from the visual impacts.

Cedar Grove will have minor visual impacts associated with the modifications to the intersection of Cedar Grove Road and MD 3. The existing stormwater management facility and planned landscape elements will further mitigate visual impacts resulting from this alternate.

Crofton Farms (townhouses) is currently visible from MD 3. The view into and from Crofton Farms will be screened by the existing wooden fence and will have minimal visual impacts and will be mitigated through planned landscape elements.

Canter Farms will not be visually impacted as it has wide setbacks from MD 3 and is screened by dense woods. Access to the community via Waugh Chapel Road and Saint Stephens Road will not be visually impacted because of the distance from the intersection at MD 3 to the community entrances.

Crofton Village will experience minor visual impacts associated with the SHA Selected Alternate in this area due to the dense woods along MD 3. There may be some views to and from the highway during the months when the deciduous trees are without their leaves. The upgrade to the intersection of MD 3 and Johns Hopkins Road will not be visible from the residential community, and the character of the Crofton Village community will remain the same. Visual impacts will be minor and will be mitigated through planned landscape elements.

To accommodate bicyclists off the roadway, a 10-foot wide bicycle path is proposed east of MD 3 from the MD 450 interchange north to the intersection of Waugh Chapel and Reidel Roads. A 10-foot wide bicycle path is also under consideration on the west side of MD 3 from the intersection of Waugh Chapel and Reidel Roads north to McKnew Road. An 8-foot wide bicycle path is proposed on the west side of MD 3 between Crawford/Cronson Boulevard and

Conway Road, to accommodate both bicycle and pedestrian traffic. These bicycle paths will be visible from MD 3.

b. Interchange Options

Several interchange options in five primary locations along MD 3 are provided for Build Alternates 3 and 5 Modified. The visual impacts of these options include:

MD 450

The major visual impact associated with the SHA Selected Alternate will be a result of the grade separation at MD 3 and MD 450 with MD 450 elevated over MD 3 and the addition of the loop ramp for access to MD 3 northbound. This option directly connects the existing MD 450 roadways by providing a new alignment for MD 450. The resulting raised roadway (approximately 24 feet above existing at the crossing) will be visible from both directions on MD 3 and will be seen at a greater distance than the current intersection. The proposed alignment and widening will impact a small portion of the existing dense woods. The openness of the single loop will be mitigated through planned landscaping and reforestation design within the loop and tree planting on the outside-elevated ramp.

The proposed alignment for MD 450 (West) is relocated to the south and encompasses the BGE substation. This alignment will remove existing tree screening and allow motorists to view the BGE substation from both MD 450 and MD 3. Landscaping and naturalized tree planting will help mitigate the visual impacts from construction activities. Over time, the BGE substation will become less visible as plant material matures.

East MD 450 includes access ramps, which elevate the roadway approximately 24 feet, making the new alignment on this portion of MD 450 more visible from both directions on MD 3. The visual impacts of this widening include opening the existing roadway section through the removal of mature trees along the wetland. The wetland will be more visible to motorists traveling along the slip ramps and along the proposed bicycle trail. Planned landscape elements will help to mitigate the visual impacts to both the roadway section and the existing wetlands.

Pidgeon House Corner will have greater visual impacts from the SHA Selected Alternate because of the elevation of MD 450 over MD 3, and because the roadway will no longer be screened by existing grades. These impacts will be mitigated by planned landscape elements.

Cronson/Crawford Boulevard

The SHA Selected Alternate is an upgrade of existing intersection conditions. Because this intersection is currently an open area with sparse tree coverage, the visual impacts will be minimal. Visual impacts resulting from the widened roadway will be mitigated by planned landscape elements. The addition of the right turn lane at Club House Gate and MD 3 will have moderate visual impacts to the Crofton community. These impacts will be mitigated by the parking area at the entrance of Club House Gate creating a visual buffer between the community

and the intersection. Planned landscape elements will further mitigate visual impacts resulting from this alternate.

MD 424 (Continuous Flow Intersection)

This proposed option is an upgrade of existing intersection conditions without a grade separation. Because this intersection is currently an open area with sparse tree coverage, the visual impacts will be minimal. Visual impacts resulting from the widened roadway will be mitigated by planned landscape elements and other aesthetic treatments.

Waugh Chapel Road /Reidel Road

Visual impacts that result from constructing MD 3 over Waugh Chapel Road/Reidel Road will be the increased view of MD 3 from Waugh Chapel/Reidel Road and the surrounding residential communities and commercial businesses. Motorists traveling on Waugh Chapel/Reidel Road will view MD 3 from a greater distance. While the proposed alignment will make the interchange wider the overall width of the roadway in this section does not increase significantly and visual impacts will be minimal. Planned landscape elements will mitigate the visual impacts for this option.

Canter Farms will have slightly increased visual impacts because the proposed upgrades to Waugh Chapel Road are carried further along Waugh Chapel Road toward the Canter Farms entrances. The alignment ties into the existing roadway alignment prior to the Canter Farms entrances. Visual impacts will be mitigated through planned landscape elements.

MD 175

Visual impacts resulting from the SHA Selected Alternate will result from the widening of the intersection and the loss of tree coverage in several places. However, the existing visual character of the area will not be altered. Planned landscape elements will mitigate the visual impacts for the proposed option.

The connection of Charles Hall Road to Holiday Park Drive will have minor visual impacts to the private residence located in the area. The new roadway will provide excellent views of the densely forested site from both directions of travel. The residence at Belts Drive will most likely not be visually impacted as the residence is at a higher elevation and the dense forest combined with the elevation change should screen the proposed alignment of Charles Hall Road from the residence.

Visual impacts to Jabez Branch will be minimal as the stream is located in a steeply sloped, densely wooded area. Existing tree cover will be maintained to the maximum extent possible in areas where widening and elevation change the views of Jabez Branch. Planned landscape elements will mitigate the visual impacts.

c. Community Involvement

SHA has been working with the MD 3 Citizen Focus Group for several years seeking their comments and concerns regarding visual quality and preferences for MD 3. In 2003 the Focus Group Studied the corridor with respect to the existing roadway design, materials, colors, textures, and structures. Visual quality and aesthetics options were presented and discussed with the Focus Group. The Focus Group participated in a visual aesthetics survey that sought to identify preferences in the proposed design, materials, colors, textures, and structures. The results of the survey will be considered during the design phase of the project.

The SHA Selected Alternate will introduce boulevard type treatments wherever possible and appropriate throughout the corridor. Additional comments regarding the corridor's visual qualities and aesthetics were received at the Alternates Public workshop and the Location/Design Public Hearing. These comments will be considered during final design of the project.

H. SECONDARY AND CUMULATIVE EFFECTS

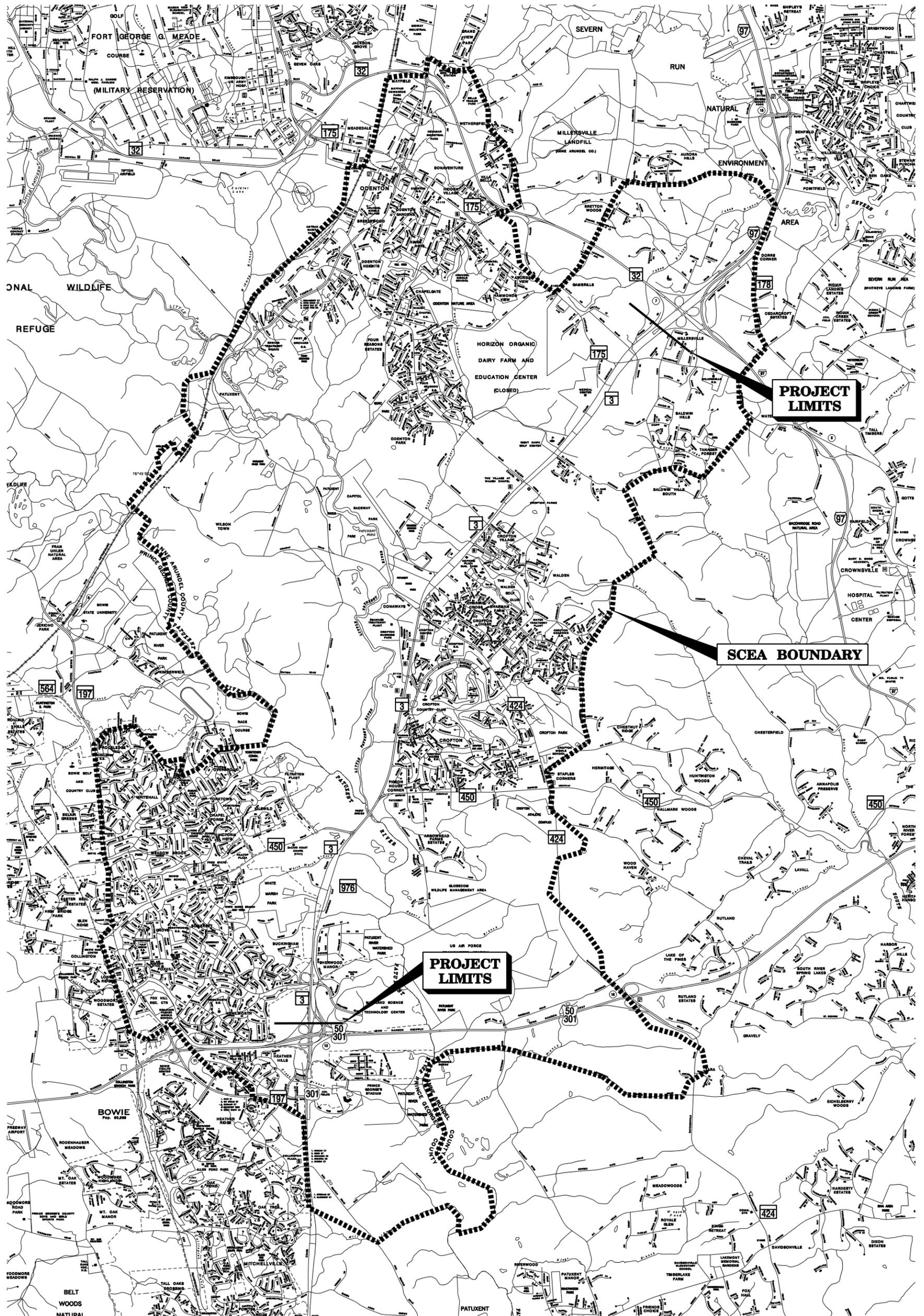
A Technical Memorandum describing the Secondary and Cumulative Effects Analysis (SCEA) has been prepared for this project. Although SCEA has been renamed since the Technical Memorandum was prepared to Indirect and Cumulative Effects (ICE) Analysis, the term SCEA has been retained for purposes of this document.

The SCEA resources evaluated for cumulative effects include a set of specific resources (Wetlands, Floodplains, Streams / Fish and Aquatic Habitat, National Register and National Register Eligible Historic Sites, Archeological Sites, Parks, Groundwater, Forests, State and Federal Endangered Species, Farmland, Communities).

Temporal and geographic boundaries were derived to encompass all resources that could be affected by the project. The temporal boundary extends from 1970 to 2020 and the geographic boundary is shown in **Figure IV-10**. Based on readily available data from State and County sources, the resources were mapped using GIS mapping techniques and analyzed to determine the nature and extent of secondary and cumulative effects created by the proposed project.

The SHA Selected Alternate would result in changes in land use from business and residential land to permanent transportation uses. The SHA Selected Alternate is contained primarily within the existing MD 3 right-of-way; therefore these changes in land use type would have little effect on the overall pattern of development in the study area. No new access would be provided to previously inaccessible properties that would encourage development of open space areas. In addition, SHA has coordinated with Anne Arundel and Prince George's counties on developing language in a Memorandum of Understanding that would preserve right-of-way for potential future interchanges. This preservation would limit development and access to MD 3 at potential interchange locations such as MD 450, Cronson/Crawford Blvd, MD 424, Waugh Chapel Road, and MD 175. This language has been reviewed by USFWS, MDE, USACOE, Anne Arundel and Prince George's counties for their comment. The final approved language will be included in the Record of Decision.

SHA is also working to identify opportunities to reduce motor vehicle greenhouse gas emissions in order to address issues associated with global climate changes. Examples of some potential



SNA MARYLAND DEPARTMENT OF TRANSPORTATION
 State Highway Administration STATE HIGHWAY ADMINISTRATION

MD 3 PROJECT PLANNING STUDY
 Final Environmental Impact Statement

SCEA GEOGRAPHIC BOUNDARY

SCALE	As Shown	FIGURE	IV-10
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changes to reduce emissions from transportation include integration of alternative energy sources, using more energy efficient vehicles and systems of transportation, and reducing the total number of miles driven.

As part of the long-term highway development process SHA will continue coordination with FHWA in order to incorporate the federal goals for transportation planning. Topics like economic vitality, safety, security, mobility, environment, connectivity, efficiency, and preservation will be considered as this project and others like it move forward. As FHWA has stated, “The objective is to advance the practice and application of transportation planning among state, regional, and local transportation planning agencies to successfully meet growing concerns about the relationship between transportation and climate change”.

The No-Build Alternate is inconsistent with each comprehensive plan for the study area, all of which include assumptions that MD 3 would be improved. Elements of the SHA Selected Alternate are consistent with various aspects of the master plans.

All area master plans include recommendations for limiting access points onto MD 3, improving the road through streetscape and urban design, and providing new pedestrian and bicycle facilities. The proposed ARDS and modifications are consistent with these concepts.

The small area plans for Anne Arundel County include the Odenton Small Area Plan, which covers the Gambrills area, the Crofton Small Area Plan, which covers the North Crofton area, Crofton Triangle, and Priest Bridge portions of the study area. These plans identify the base widening concept (later called the “boulevard concept” and incorporated into the SHA Selected Alternate) approved by the earlier MD 3 Task Force as the accepted concept for the road. The Crownsville Plan, which includes the Millersville area, makes no comment on the character of MD 3, other than to note future limits to strip development that are important to preserving the area’s rural character.

The Crofton Small Area Plan calls for expansion of commercial development in the area of Cronson Boulevard. The SHA Selected Alternate does not preclude expansion of commercial areas.

The Bowie Master Plan includes the Eastern Bowie, Sherwood Manor, and Bowie portions of the study area. The Bowie Master Plan identifies upgrading MD 3 to freeway standards with a series of interchanges. The plan also notes that an alternative to this concept would be to separate local traffic from through traffic, including provision of a local access road. The SHA Selected Alternate generally reflects this concept. Interchange options included in the SHA Selected Alternate would eliminate traffic signals, enhance safety, and ease delays because of the grade separations.

The Bowie Master Plan calls for acquiring properties in the median for safety reasons and to protect perennial streams. The SHA Selected Alternate would require acquisition of some property in the median of MD 3; however, it would not totally remove all median development to accommodate roadway modifications. The SHA Selected Alternate would not preclude local government from undertaking such acquisitions in the future.

Increasing the capacity of the highway is not a primary purpose of the MD 3 project. In addition, the project will consolidate and minimize the number of direct access points to MD 3 as shown on the SHA Selected Alternate figures in **Appendix F – SHA Selected Alternate and ARDS Mapping** (access controls have been integrated into the SHA Selected Alternate as part of the TSM/TDM elements). Therefore, this project is not expected to induce additional growth within the study area nor will it cause secondary impacts, associated with project-induced growth, to occur.

Through the access permitting process, all currently proposed site developments have been analyzed for conformance with the SHA Selected Alternate in order to avoid future property impacts. Furthermore, roadway access and/or capacity improvements have been required in order to prevent additional congestion and safety hazards.

Cumulative effects within the SCEA boundary are reflective of the overall regional growth. Major development projects like Crofton, and more recently the Piney Orchard and the Maryland Science and Technology Center, are creating new opportunities and incentives for change of land uses. The area has and is expected to continue to convert agricultural land uses to suburban uses, with a predominance of residential use. Potential cumulative effects on the natural environment and/or human environment could occur in the future regardless of whether the MD 3 project is implemented. In fact, MD 3 improvements are a consequence of the regional transportation demand and not a generator of the demand. Therefore, the cumulative effects of the proposed MD 3 improvements are expected to be of minimal consequence within the context of planned growth in the area. It is expected that the project will fulfill its purpose to provide transportation efficiency as it was intended through the local transportation planning process.

As the residential market in the area has grown, so too has the commercial and service sector, developing primarily along the routes of major accessibility as permitted by zoning. Public road improvements have followed the private sector development. Over time, land development has been subject to progressively more sophisticated and sensitive public review and regulation. The increased strength of environmentally sensitive zoning and land development regulation, in addition to Smart Growth regulations, will minimize adverse impacts of future land development in the areas where additional development may occur. Therefore, the major impacts to the environment have already been experienced and future impacts will be minimal and may be mitigated by stricter regulations on future land development.

Long term global climate change is a growing concern among the scientific community, who argue that human-induced increases in atmospheric greenhouse gases (GHGs) are the predominant cause of global temperature increases. Many outlets have identified that the combustion of fossil fuels generates the highest volume of GHG emissions.