III. ENVIRONMENTAL CONSEQUENCES OF THE PREFERRED ALTERNATE

A detailed analysis of the Preferred Alternate was conducted to determine potential effects to socioeconomic, cultural and natural environmental resources (**Table III-1**). This analysis is based upon the Preferred Alternative as it is now defined and which FHWA is approving with this FONSI. Thus, this analysis is based upon the Managed Lanes Alternate with an ETL management strategy. Further, this document reflects changes in wetland determinations and limits of disturbance of floodplains and woodlands that have occurred since the EA.

The following is a summary of affects associated with the Preferred Alternate.

Table III-1. Summary of Impacts

RESOURCE CATEGORY	Managed Lanes Alternate (Preferred Alternate)	
	EA Impacts	FONSI Impacts
Residential (acres)	29.0	29.0
Commercial (acres)	19.1	19.1
Other (acres)	49.6	49.6
TOTAL ROW (acres)	97.7	97.7
Residential Displacements (number)	7 residences 12 outbuildings	7 residences 12 outbuildings
Commercial Property Structural Displacements (number)	0	1
Permanent Wetlands Impacts (acres)	5.1	3.51[1]
Temporary Wetland Impacts (square feet)	N/A	1.36[2]
Permanent Stream Impacts (linear feet)	15,956	12,998[1]
Temporary Stream Impacts (linear feet)	N/A	5,024[2]
Floodplain (acres)	44.9	44.5[3]
Woodland (acres)	210.6	141.06[3]
Threatened/Endangered Species Impacts (species)	0	0
NR/NRE Historic Sites Impacted (number)	0	0
NR/NRE Archaeological Sites Impacted (number)	1	0[4]
Noise Impacts (number)	17 NSAs	17 NSAs
Air Quality Impacts (sites exceeding CO S/NAAQS)	0	0
Section 4(f) Resource Use (number)	0	0

[1]Since the Environmental Assessment was issued, a Jurisdictional Determination has been completed by the USACE and MDE. Some of the wetland and streams impacts presented in the EA have been determined non-jurisdictional. Minimization and avoidance measures have been added to the design of the Preferred Alternate since the EA was issued. Also, the EA impacts have been separated into permanent and temporary impacts for the FONSI.
[2] All temporary impacts were calculated using the Limits of Disturbance (LOD). The LOD includes 25 feet from the edge of the cut/fill line.
[3] The decrease in impacts is a result of a reduction in the LOD, which changed since the EA because of design modifications.
[4]MHT determined the Smith Site ineligible for the National Register of Historic Places (NRHP).

A. Socioeconomic Resources

1. Land Use

Existing land use along the Section 100 study area is dominated by residential uses from the I-95/I-895 (N) Split to the I-695 interchange. North of the I-695 interchange, the study area is dominated by a mix of forested, residential, and commercial uses, with some sparsely scattered areas of open space and industrial uses.

The Preferred Alternate would result in the direct conversion of only minor amounts of residential, commercial, forested, and open space land to transportation use. These minor land use impacts would be located throughout the Section 100 corridor, adjacent to the existing highway. The extent, pace, and location of development growth along I-95, including Section 100, would be influenced and controlled by State and County land development policies and plans. Section 100 would accommodate future planned growth within the study area; however, future growth is not dependent on proposed improvements to Section 100. The alternate would affect local residential development rates as documented in the EA. Section 100 is currently, and would remain, a fully access-controlled highway under the Preferred Alternate.

2. Right-of-Way and Displacements

The majority of the improvements associated with the Preferred Alternate would be located within the Authority's existing right-of-way (ROW); however, approximately 97.7 acres of new ROW would be required. Seven residences and twelve residential outbuildings would be displaced. Most of the residential outbuildings have been abandoned or are not in use.

In accordance with the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, all families, individuals, and businesses displaced by the project would be treated fairly, consistently, and equitably so that they will not suffer disproportionate impacts as a result of the project (Appendix C). The Authority will provide relocation assistance and advisory services to eligible persons who are displaced by this project.

Both Garden Village and Chesaco Heights communities, located between the I-95/I-895 split and the Chesaco Avenue overpass, were avoided by adding retaining walls along the roadway. In addition, retaining walls were used to avoid impacting the Willow Hill and Crystal Spring communities, a majority of the residences along East Avenue, and the 96 inch water line (the Big Inch).

3. Local Businesses

The Preferred Alternate would result in the displacement of one agricultural business located just north of Cowenton Avenue. Because this alternate involves the widening of an existing access-controlled highway corridor and would not add or remove any interchanges, access to local businesses would not be substantially altered. Also, by reducing traffic congestion by improving traffic operation along I-95 through this corridor, access to local businesses would be improved.

4. Environmental Justice

It is the policy of the Authority 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 physical or mental handicap in all projects that involve action by the Federal Highway Administration (FHWA). The Authority

will not discriminate in project planning, design, construction, right-of-way acquisitions, or provision of relocation advisory assistance. This policy has been incorporated in all levels of the planning process in order that proper consideration may be given to the social, economic, and environmental effects of all projects. Alleged discriminatory actions should be addressed to Ms. Melissa Williams of the Maryland Transportation Authority for investigation. Ms. Williams can be contacted at 410-288-8470, extension 383.

Executive order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations" requires that each Federal agency identify, and address, any disproportionately high and adverse impact on minority and/or low-income populations resulting from alternates under consideration and to provide opportunity for participation in the public involvement process.

An analysis of affected persons in the study area indicates that no disproportionate adverse impacts would occur to minority or low-income populations as a result of the Preferred Alternate. Visual impacts to the Fontana Village and Gilley Terrace communities have been minimized due to the redesign of the five level I-95/I-695 Interchange, as stated in the EA, to a four level I-95/I-695 Interchange.

5. Transit

Bus transit would benefit from the implementation of managed lanes under the Preferred Alternate. By using the managed lanes, buses would benefit from the reduced congestion and travel times with ridership anticipated to increase 6% over the General Purpose Lane Alternative by the year 2025. The estimates for the I-95 study are consistent with the national experience in transit. Documentation such as *Traveler Response to Transportation System Changes* indicate that a nine minute travel time savings on a 32 minute trip (present travel time from MD 43 to Downtown Baltimore) coupled with an increase in service to accommodate demand would yield a projected ridership increase between 3 to 11 percent. An additional convenience for buses is the direct access to and from the interchanges for managed lanes that will be provided in the design of the Preferred Alternate.

6. Aesthetics

Effects on visual quality for the Preferred Alternate would include expanded travel lanes, reduced median width, and new structures along the corridor. There would be less vegetation along the highway in medians and along roadsides. New highway structures, such as the proposed I-95/I-695 Interchange, would be visible along the corridor. The five level I-95/I-695 Interchange described in the EA has since been redesigned to a lower, less intrusive four level interchange. However, despite these changes, the overall visual appearance would still be consistent with the visual character of the Interstate highway system as it currently exists. Landscaping opportunities will be considered to lessen the visual intrusion where appropriate.

7. Community Facilities and Services

Small amounts of ROW would be acquired from eight community facilities within the study area. Land acquired from these facilities would be sliver takes and would not affect the operation or use of these facilities. The Preferred Alternate would have a positive effect on emergency services throughout the project area. Traffic congestion along I-95 would be reduced, improving emergency response times and access to existing facilities. In addition, the Authority is working closely with emergency response providers to improve safety and access to median crossovers.

B. Cultural Resources

In compliance with Section 106 of the National Historic Preservation Act of 1966, it has been determined through consultation and coordination with the Federal Highway Administration and the State Historic Preservation Officer (SHPO) that the Preferred Alternate will have no effect on archaeological resources, as no archaeological resources within the study area are eligible for listing on the National Register of Historic Places. One historic property that is eligible for listing in the National Register of Historic Places (the Koch property), is located within the project's area of potential effect. However, the property is separated both physically and visually from the highway by a substantial stand of trees. Therefore, the SHPO concluded that the Preferred Alternate would have no adverse effect on this or any other historic sites. Correspondence documenting this finding is located in Appendix D.

C. Natural Environment

1. Farmlands

Because the area surrounding Section 100 is designated for urban development, Prime Farmland Soils and Soils of Statewide Importance located within the study area are exempt from Farmland Protection Policy Act of 1981 (FPPA) coordination. The Preferred Alternate would not impact any State protected farmlands within the study area.

2. Soils

The amount of impervious area would increase by 153 acres throughout the study area. The amount of erosion and sedimentation would increase in areas exposed temporarily during construction due to the increase in stormwater runoff from the impervious surfaces. The impervious area for each alternate is listed in **Table III-2.**

Table III-2. Estimated Proposed Impervious Area

3rd Order Watershed	Existing Impervious Area (acres)	Proposed New Impervious Area (acres)	Percent Increase Over Existing
Moores Run	33	49	50%
Redhouse Creek	31	41	33%
Stemmers Run	63	114	80%
White Marsh Run	92	156	69%
Bird River	14	22	60%
Gunpowder River	14	18	30%
Total	247	400	62%

Several methods will be used during construction to decrease erosion effects, including structural, vegetative, and operational methods. Grading and Erosion and Sedimentation (E&S) Plans will provide control measures to minimize potential impacts during pre-construction and post-construction activities in accordance with Maryland Department of the Environment (MDE) regulations. In general, the topography of the study area is relatively gentle (average 0-5 percent); however, there are localized areas of steeper slopes that may equal or exceed 15 percent. Where these areas coincide with proposed improvements, appropriate engineering measures and sediment controls would be employed to reduce erosion and sedimentation.

3. Floodplains

The Preferred Alternate would affect approximately 45 acres of floodplains in the study area. A majority of the floodplain impacts are caused by fill encroachment and pier placement, especially within the I-95/I-695 Interchange. Floodplain impacts for the Preferred Alternate are described in **Table III-3.**

Avoidance and minimization efforts include reducing encroachments by increasing the steepness of fill slopes and/or incorporating retaining walls. In addition, the proposed bridge span that carries the I-895 northbound general purpose lanes over the existing I-95 southbound and proposed I-95 northbound lanes will be lengthened to avoid Moore's Run and minimize floodplain encroachment. Also, bridge spans in the I-95/I-695 Interchange are being considered as avoidance and minimization measures for the Stemmer's Run floodplain.

Table III-3. Impacts to Floodplains from the Preferred Alternate

3rd Order Watershed	Floodplain	Preferred Alternate Impacts (acres)	Plate No.
Redhouse Creek	Moores Run	2.72	27-29
	Redhouse Creek	0.75	32
Stemmers Run	Stemmers Run	35.53	34-39
White Marsh	White Marsh Run	5.50	44, 45, 47
	Honeygo Run	0	48
Lower Gunpowder	Gunpowder	0	52
Total		**44.50***	

*Minimization and avoidance measures have been added to the design of the Preferred Alternate since the EA was issued.

4. Forests

Widening I-95 would affect existing forest edge and create new forest edge, thereby reducing or eliminating a shallow wooded buffer between I-95 and some adjacent communities. A majority of the forest impacts occur within and adjacent to the proposed interchanges. These forest stands are fragmented and have been polluted from the existing roadway. In addition, the proposed I-895 northbound span over Moores Run and I-95 would affect a forested area east of the existing interchange. The Preferred Alternate will comply with the Maryland Reforestation Act, which requires the minimization of cutting or clearing trees, replacement of wooded areas affected and/or contributions to a reforestation fund for highway construction projects. Mitigation for forest impacts will be provided at a one-to-one ratio. **Table III-4** shows the amount of forested area that would be impacted by the Preferred Alternate.

Table III-4. Woodland Impacts by Sub-Watershed

Sub-Watershed	Woodland Impact (acres)
Moores Run	0
Redhouse Creek	20.39
Stemmers Run	46.47
White Marsh Run	46.59
Bird River	17.84
Gunpowder River	9.77
Total	**141.06***

* Since the EA was issued, the Limit of Disturbance has changed due to design modifications

5. Large and Significant Trees

The Preferred Alternate would impact eleven large and significant trees (**Table III-5**). Ten of the eleven large and significant trees affected by the Preferred Alternate would be removed. Trees 49, 50, 59, and 63 are in poor health due to root zone compaction and air pollution from the existing I-95.

6. FIDS

The Preferred Alternate would impact approximately 6.31 acres of Forest Interior Dwelling Species (FIDS) habitat within the study area due to the placement of SWM facilities and roadway widening. The SWM facilities would be located adjacent to the roadway embankment within several wooded areas of the Bird River 3rd Order Watershed. The SWM facilities and road widening would result in a shift of the forest edge towards the interior of the forest, minimizing the habitat available. The majority of the impacts are to fragmented sections of FIDS habitat that do not provide high quality habitat. Other more contiguous areas of FIDS habitat that do provide valuable habitat are present within the study area, however they would not be impacted by the project.

7. Threatened and Endangered Species

It has been determined that there will be no State- or Federal-listed threatened or endangered species impacted by the Preferred Alternate.

Table III-5. Impacts to Large and Significant Trees from the Preferred Alternate

Tree #	Plate #	Tree Species		Impact to Critical Root Zone (Percent)	
		Common Name	Scientific Name	Percent	Removed or Impacted
50	32	Southern red oak	*Quercus falcata*	60	Removed
49	32	Chestnut oak	*Quercus prinus*	60	Removed
53	38	Red oak	*Quercus rubra*	30	Removed
57	36	White oak	*Quercus alba*	60	Removed
59	36	Southern red oak	*Quercus falcata*	30	Removed
60	40	Southern red oak	*Quercus falcata*	50	Removed
61	41	Black willow	*Salix nigra*	5	Impacted
62	41	Black willow	*Salix nigra*	40	Removed
63	41	Silver maple	*Acer saccharinum*	100	Removed
77	35	Yellow poplar	*Liriodendron tulipifera*	5	Removed
78	35	Yellow poplar	*Liriodendron tulipifera*	15	Removed

8. Noise

Of the 23 NSA's in the study area (**Figures III-1A to 1C**), the Federal Noise Abatement Criteria were exceeded at 17, and noise mitigation was evaluated at each of these areas. The use of earth berms is generally not appropriate for urban areas such as Section 100 because of the right-of-way constraints. Therefore, sound barriers were evaluated for each impacted area. Any existing noise abatement measures that are affected by the Section 100 project, including berms and noise walls, would be replaced with new measures. NSAs 1, 3, 4, 5, and 6 have existing noise walls currently in place. The existing wall at NSA 1 would need to be modified near Receptor 1-1 (north end of the barrier) from 17-foot to a 23-foot high noise barrier, for approximately 1,251 feet paralleling northbound I-95. In NSA 3, approximately 725 feet of the north end of the existing barrier would need to be rebuilt west of the existing barrier for noise abatement. The existing noise wall at NSAs 4, 5, and 6 will be moved further away from the centerline of I-95 in order to accommodate the wider typical section of the Preferred Alternate.

Construction of the Preferred Alternate would have direct impact on receptors located close to the construction site, and would have an indirect impact on receptors located near roadways where traffic flow characteristics are altered due to re-routing of vehicles from the construction area. As with any major construction project, the area around the construction site is likely to experience varied periods and degrees of noise impact. Several mitigation procedures will be followed to assist in minimizing the temporary impacts of construction noise. Adjustments to the equipment, the provision of temporary noise barriers, varying the construction activity areas to redistribute noise events, and offering financial incentives to contractors to work quickly and quietly are all options to decrease temporary noise impacts. These mitigation measures will be considered during final design to minimize public exposure to short-term noise impacts.

Sound barriers were evaluated and found feasible and reasonable for 10 of the 17 impacted NSAs within the study area: 1, 3, 7, 8, 9, 11, 14, 16, 22, and 23 (**Table III-6**).

Table III-6. Preliminary Noise Barrier Cost Analysis Summary

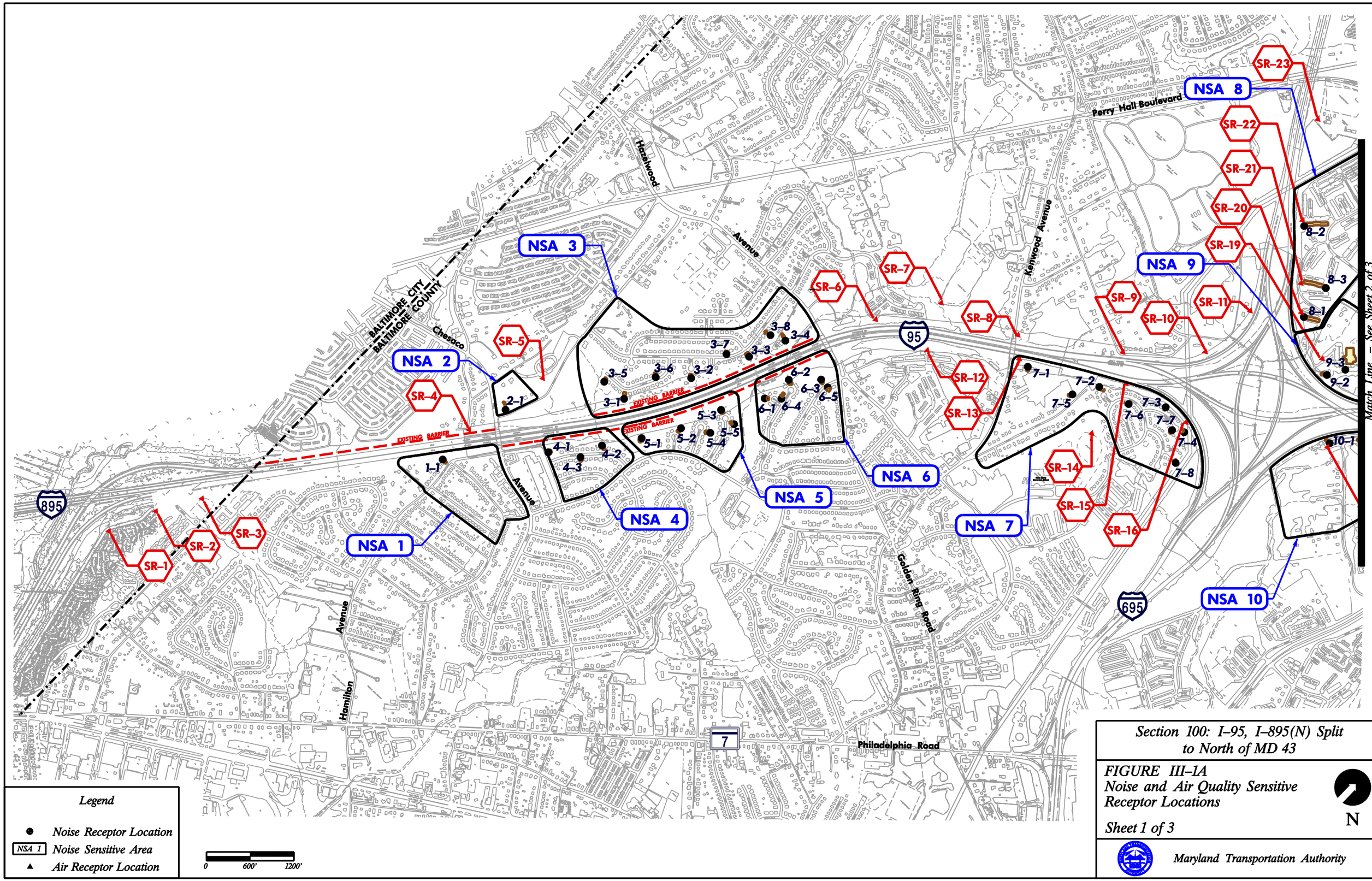
NSA	Length (ft)	Height (ft)	Cost of Sound Barrier	Insertion Loss (first row residences)	Benefited Residences	Cost/Benefited Residence
1	1,251	23	$488,641	6 (dBA)	18	$27,147
3	725	21	$249,123	7-11 (dBA)	30	$8,304
7	3,871	20	$1,280,527	8-15 (dBA)	35	$36,586
8&9	4,279	30	$2,123,240	5-8 (dBA)	193	$11,001
11	2,033	14	$470,761	8-12 (dBA)	14	$33,626
14	1,250	20	$413,500	8-11 (dBA)	36	$11,486
16	2,380	18	$708,574	5-12 (dBA)	24	$29,524
22	2,636	19	$812,042	7-10 (dBA)	17	$47,767
23	2,300	20	$760,840	5-10 (dBA)	28	$27,173
Total Cost of Sound Barriers for the Preferred Alternate = $7,565,553						

9. Air

The Section 100 study area is located within the Metropolitan Baltimore Intrastate Air Quality Control Region. This region is not designated as a non-attainment area for the following pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), or particulate matter (PM_{10}). It is, however, designated as a severe non-attainment area for ozone. Because of this non-attainment designation for ozone, the region is subject to the implementation of reasonably available control measures, such as the Vehicle Emissions Inspection Program (VEIP), and also is subject to air quality conformity requirements under Section 176 of the Clean Air Act, which require that the region's long range transportation plan conform to the limits on pollutant emissions in Maryland's State Implementation Plan.

The CAL3QHC models did not predict any concentrations that would exceed the Statewide/National Ambient Air Quality Standards (S/NAAQS) of 35 parts per million (ppm) for the one-hour concentration of CO or nine ppm for the eight-hour concentration of CO. The S/NAAQS concentrations would not be exceeded for the Preferred Alternate. All of the Air Quality Sensitive Receptor locations are shown on **Figures III-1A -1C**.

Section 100 is currently included in the Baltimore region's long range transportation plan, "Transportation 2030," which was adopted by the Baltimore Regional Transportation Board (BRTB) in December 2004. The air quality conformity analysis for the 2030 plan assumed completion of the General Purposes Lanes Alternate for Section 100. The General Purpose Lanes Alternate was used in the conformity analysis because it represented a worst-case scenario for air emissions. After the air quality conformity analysis was completed, the Authority identified the Managed Lanes Alternate as its preferred alternative. By comparison to the General Purpose Lanes Alternate, the Managed Lanes Alternate will have equivalent or lower emissions as a result of the free-flowing traffic in the managed lanes due to the higher LOS. Therefore, the selection of the Managed Lanes Alternate is consistent with the conformity finding for the long range plan and TIP.

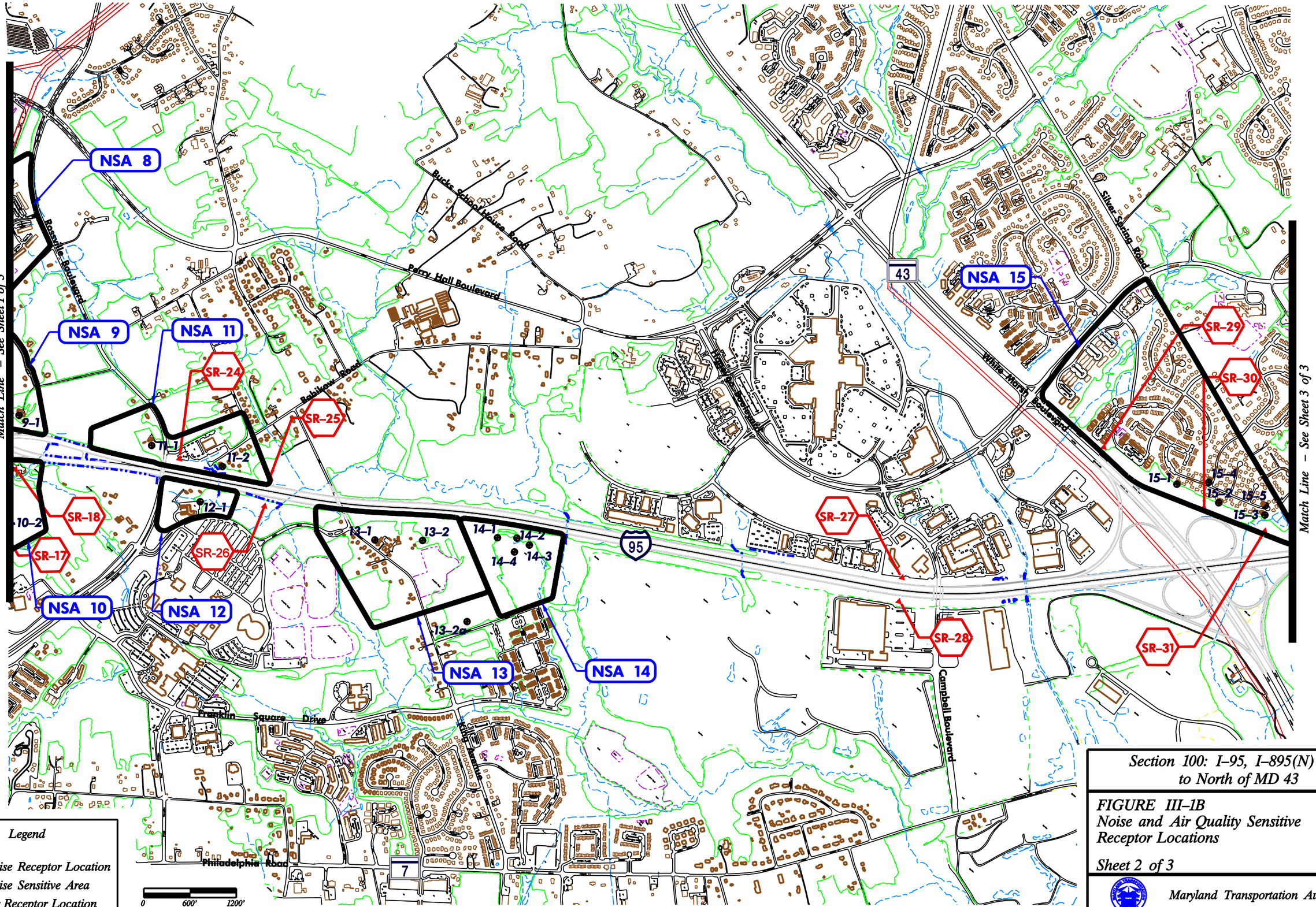


Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE III–1A
Noise and Air Quality Sensitive Receptor Locations

Sheet 1 of 3

Maryland Transportation Authority



Legend

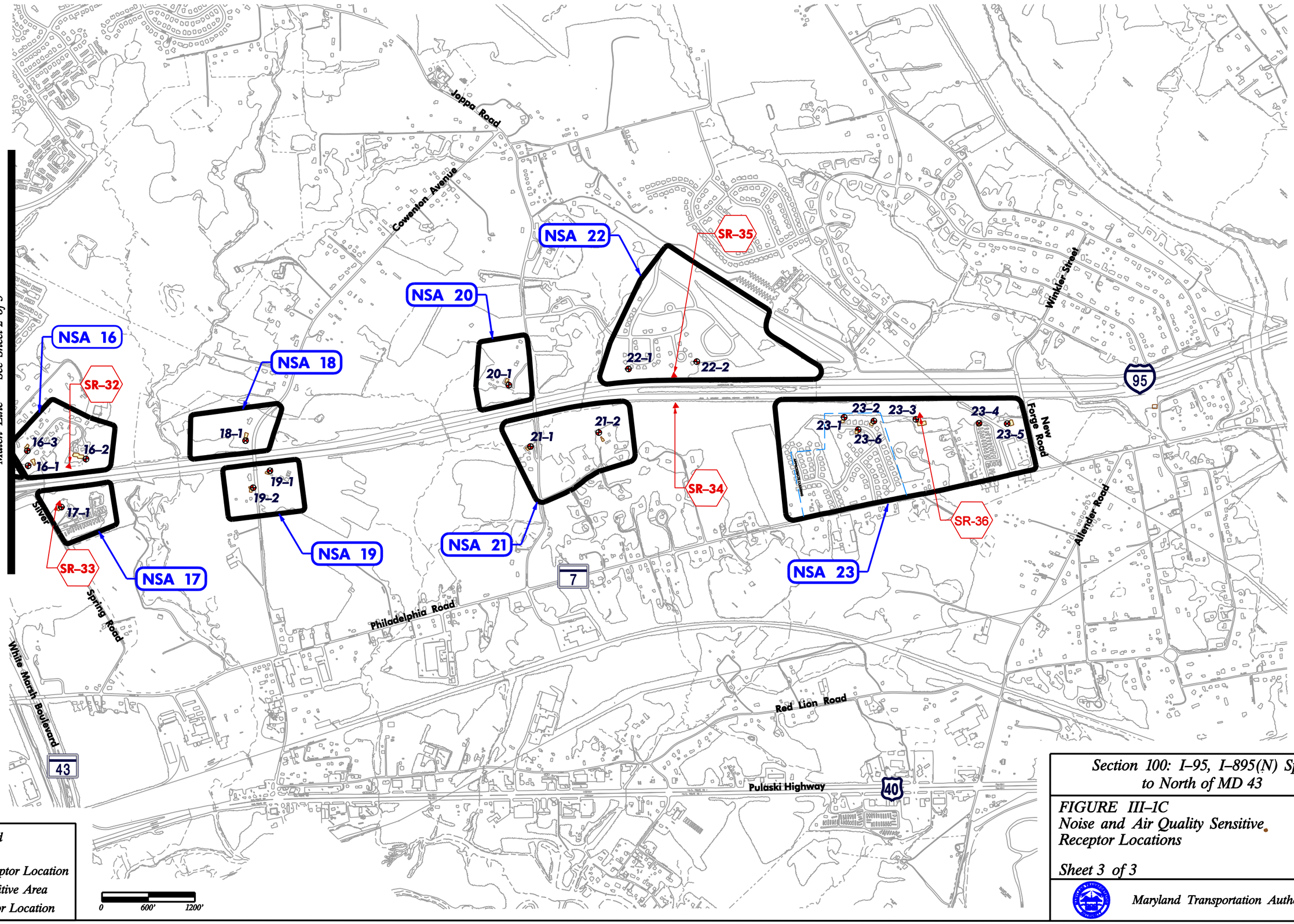
- Noise Receptor Location
- NSA 1 Noise Sensitive Area
- Air Receptor Location

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE III–1B
Noise and Air Quality Sensitive Receptor Locations

Sheet 2 of 3

Maryland Transportation Authority



Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE III–1C
Noise and Air Quality Sensitive Receptor Locations

Sheet 3 of 3

Maryland Transportation Authority

The Authority is coordinating and will continue to coordinate with BRTB to ensure that the Managed Lanes Alternate is included in the air quality modeling for the next update to the region's long range plan and transportation improvement program (TIP). The first step in this process is the update cycle for the 2006-2010 TIP, which began in March 2005. Refer to the Section 100 Air Quality Technical Report for additional information.

10. Hazardous Materials

A Preliminary Site Assessment (PSA) is recommended for three high potential contaminant value sites impacted by the Preferred Alternate: the McCormick Place/Ayres property, Honeygo Run Reclamation Center, and Trailer Park/Honeygo Run Reclamation Center. Removal of the solid waste debris piles at two sites (ADM ID Nos. 17 and 18) is required. Additional studies are not recommended at the remaining sites impacted by the Preferred Alternate. It should be noted, however, that should underground storage tanks (USTs) or other soil and/or groundwater contamination be encountered, remediation would be undertaken in accordance with all applicable local and State regulations.

11. Waters of the US

The USACE is a concurring agency on all documents required in the NEPA process for Section 100. The Authority has coordinated with the USACE to ensure all minimization and avoidance efforts for stream and wetland impacts have been considered during the planning phase of Section 100. The Authority will continue to coordinate with the USACE on all stream and wetland impacts throughout the design and construction phases.

Several stream crossings would be required for the Preferred Alternate, thereby resulting in impacts to Waters of the U.S. There would be approximately 12,998 linear feet of streams affected by the project: including 5,858 linear feet of perennial streams, 3,902 linear feet of intermittent streams, and 3,238 linear feet of ephemeral drainage (**Table III-7**).

Table III-7. Stream Impacts from the Preferred Alternate

Type of Impact	Watershed	Herring Run	Redhouse Creek	Stemmers Run	White Marsh Run	Bird River	Gunpowder River	Total
Impacts in Linear Feet								
Permanent	Perennial	0	442	2,122	1,335	450	1,509	5,858
	Intermittent	0	1,258	1,637	418	436	153	3,902
	Ephemeral	0	0	0	3,238	0	0	3,238
	Total (lf)	**0**	1,700	**3,759**	**4,991**	**886**	**1,662**	**12,998**
Temporary	Perennial	0	686	380	969	129	292	2,456
	Intermittent	0	1,031	530	218	0	39	1,818
	Ephemeral	0	0	0	750	0	0	750
	***Total (lf)**	**0**	**1,717**	**910**	**1,937**	**129**	**331**	**5,024**

*All temporary impacts were calculated using the LOD. The LOD represents 25 feet from the edge of the cut/fill line. Stream impacts have been reduced since publication of the EA due to refinements to the Jurisdictional status of waters and minimization and avoidance measures.

A majority of the streams impacted are classified as "Use I waters" and have minimal value for aquatic life. Most of the intermittent and ephemeral streams' primary water source is stormwater runoff from I-95. The impacts would include culvert extensions, filling of waters, channel relocations, and/or piping of waters between existing culverts. A large portion of the impacts to Stemmers Run (a perennial waterway) would occur at the proposed I-95/I-695 Interchange. The portion of Stemmers Run within the vicinity of the I-695 interchange is currently in poor condition from stormwater runoff, debris collection, and impacts from the construction of the existing interchange.

Complete avoidance of stream systems by the Preferred Alternate is not feasible because most systems lie perpendicular to existing I-95. Minimization efforts for Waters of the United States (WUS) include the use of steeper (2:1) roadway embankments and retaining walls to minimize the footprint. As this project progresses into final design, avoidance and minimization measures would continue to be evaluated. Additional effects that will be considered in the minimization design efforts include shading, loss of riparian vegetation, and potential changes to stream hydrology/hydraulics. Many streams in the study area currently have floodplain access; this would be retained wherever possible to preserve benefits such as velocity dissipation, storage, and sedimentation/stabilization. Retaining or adding riparian buffers, as well as fish passage through structures, will be considered during the project's design phase.

12. Wetlands

The majority of effects to wetlands caused by the Preferred Alternate would occur from widening the mainline of I-95 and improvements to the I-95/I-695 Interchange (**Table III-8**). The most extensive impact to wetlands would occur in the median of I-95 north of Joppa Road, where systems BRBR-WET5, GPJR-WET6, 7, and 8 would be filled (**Appendix A, Plates 50 and 51**). Because these wetlands are located in the median, they serve minimal functional value for aquatic and/or wildlife habitat. Impacts to wetlands within the Herring Run, Redhouse Creek, Stemmers Run (outside of the I-95/I-695 Interchange), White Marsh Run (except WMHG-WET3), and Bird River 3rd Order Watersheds would occur along the I-95 and I-695 mainline widening, where wetland systems that have hydrology linked to existing roadway drainage, would be filled.

A majority of the wetlands are located along ditchlines and within depressions created from the original construction of I-95. It is anticipated that these wetlands will be replaced in kind once the construction of the Preferred Alternate is completed. The primary function of all of these wetlands is sediment retention, sequestration of nutrients, and toxicant retention. These wetlands provide poor aquatic and/or wildlife habitat.

Total permanent wetland impacts for the Preferred Alternate would be approximately 3.51 acres.

Table III-8. Wetland Impacts from the Preferred Alternate

Type of Impact	Watershed	Herring Run	Redhouse Creek	Stemmers Run	White Marsh Run	Bird River	Gunpowder River	Total
Permanent	POW	0.0	0.0	0.0	0.24	0.0	0.0	0.24
	PEM	0.0	0.06	1.02	0.50	0.02	0.44	2.04
	PSS	0.0	0.0	0.32	0.0	0.0	0.0	0.32
	PFO	0.0	0.0	0.16	0.30	0.0	0.45	0.91
	Total (acres)	**0.0**	**0.06**	**1.50**	**1.04**	**0.02**	**0.89**	**3.51**
Temporary	POW	0.0	0.0	0.0	0.55	0.0	0.0	0.55
	PEM	0.0	0.05	0.0	0.35	0.0	0.05	0.45
	PSS	0.0	0.0	0.23	0.0	0.0	0.0	0.23
	PFO	0.0	0.0	0.01	0.03	0.08	0.01	0.13
	Total* (acres)	**0.0**	**0.05**	**0.24**	**0.93**	**0.08**	**0.06**	**1.36**

*All temporary impacts were calculated using the Limits of Disturbance (LOD). The LOD represents 25 feet buffer from the edge of the cut/fill line. Wetland impact numbers have been reduced since publication of the EA because of refinements to the Jurisdictional status of wetlands and minimization and avoidance measures added to the design.

Mitigation for Stream and Wetlands

For those wetland systems which cannot be replaced in-kind (i.e. wetlands forming due to the new topography and hydrology associated with the proposed roadway), a wetland mitigation site search was conducted using GIS information and a review of aerial photography. The Authority coordinated with the USACE, MDE, and the Baltimore County Department of Environmental Protection and Resource Management (DEPRM) for existing opportunities and conducted a field reconnaissance and assessment of all identified sites. Twelve sites were presented during an interagency field meeting in August 2003. Upon further coordination with the USACE and MDE, four sites (**Figures III-2A-2D**) were selected for mitigation investigations and plan development. Appendix E contains the correspondence between the Authority and property owners. The following is a summary of each of the proposed site's characteristics, amount and type of mitigation available and potential functions and values.

White Marsh Run

The largest potential mitigation site identified for this project is along a lower portion of White Marsh Run from east of US 40 to Ebenezer Road (**Figure III-2A**). Approximately 6000 feet of stream and 4-10 acres of wetland are targeted for improvement/replacement based on a preliminary aerial photography estimate and site reconnaissance. The site is situated on an old gravel mine and its intended use as mitigation will be for wetlands replacement, enhancement and/or preservation and stream restoration. The floodplain areas have become partially forested and large sections of some parts of the stream banks are unstable or have been poorly stabilized with gabion baskets, concrete, etc. There are also sections of the channel, which have disconnected floodplains, where renewed access would serve to both enhance floodplain wetland quality as well as reduce bank and bed stress and associated erosion. There are sections of split channel flows (approximately ¾ mile downstream of US 40) where restoration efforts to reduce the frequency of flooding into the overflow channel (via grade controls) would assist in sediment transport in the main channel. This improved transport would reduce bed degradation, improve instream habitat and reduce the potential for stresses on the adjacent banks in the main channel.

Near the approach to the MD 43 crossing, there are extended sections of stone reinforced bank protection along the west bank, which have become undermined. Efforts here would include removal of the stones and replacement with an earthen bank stabilized with bioengineering and/or native plantings. Downstream of the stone-lined banks, is the new crossing of White Marsh Run by MD 43 Extended. Restoration efforts here (if required) would include an evaluation of an improvement to the platform approach to the bridge as well as providing adequate floodplain access through the structure. Instream structures (e.g. cross-vanes) may be utilized to fix the channel low flow approach under the structure.

Additional efforts include the restoration of the anadromous fish passage at U.S. 40 by removing an existing Alaska Steep Passage Skeet fish ladder and raising the streambed from several hundred feet downstream up to a passable elevation under U.S. 40. Approximately 6000 feet of stream and 4-10 acres of wetland are targeted for improvement/replacement based on a preliminary aerial photography estimate. This would not only improve the downstream reach conditions by reducing channel entrenchment, but will also open up the entire White Marsh system upstream of US 40 to anadromous fish; something that likely has not occurred for over 30 years.

Estimates from National Wetland Inventory (NWI) mapping show 95 acres of wetlands within this mitigation site. It is likely that many of these wetland systems have changed character and/or have lost wetland status due to channel incision or other land use alteration. Previous mining activity on this site has altered the historic amount and quality of wetlands. Wash pools left over from mining may now function as wetlands. Other previously wetland areas may have been drained, or drainage systems may still occur and provide active drainage. Additional mitigation opportunities at this site include: wetland preservation, enhancement, creation, intermittent stream restoration or enhancement and upland terrestrial habitat improvements. This includes some large areas of potential enhancements, such as the existing large wash pond just north of the MD 43 crossing and east of US 40. This pond is very slowly filling with fine sediments and is mostly devoid of vegetation. Where sediment accretion is more rapid along the northern fringe/stream interface, scrub-shrub and emergent wetlands have established. Potential wetland enhancement efforts here may include both passive and active methods to increase wetland area. Active methods would include the potential filling and/or planting in relatively shallow areas. Passive techniques may include efforts to “roughen-up” the shallow surface areas using willow posts or other means to increase sedimentation and subsequent wetland vegetation recruitment. In addition to the wetland enhancement opportunities, the inlet and outlet to this pond may be retrofitted to reduce the occurrences of shad trapping in the pond. At high flows, shad access the pond at the inlet in the northwest corner; then as the stage drops, they become trapped and often die. Frequent coordination efforts with MD DNR Fisheries and USFWS will be conducted in association with any proposed improvements to this condition affecting the shad migration.

More information on the type, quality and amounts of mitigation will become available after field assessments and preliminary design studies begin.

I-95/I-695

The I-95/I-695 site is located directly over a portion of Stemmers Run (Figure III-2B). Stemmers Run, which runs through the middle of the interchange, was channelized during the

original construction of the roadway. Before the construction of I-695, this area was a wide floodplain containing a meandering stream as evidenced by historical aerial photos from the 1940s. The existing stream flows through a concrete channel, where the bottom of the channel has been washed out. Portions of the concrete bank have failed and several box culverts block fish passage. Approximately 2,400 feet of stream is targeted for restoration. Even though the new interchange will inhibit Stemmers Run by the placement of new piers and ramps, there are opportunities to greatly improve upon flood-prone area access and energy dissipation. The improvements will be accomplished by removing the concrete flumes, increasing channel sinuosity and increasing the frequency of access to floodplains for smaller storm events. This will provide additional storage for flood waters, with the goal of reducing downstream flooding and associated channel instability issues. Additional restoration of floodplain and wetlands may be feasible depending on further studies and coordination between highway designers and the preliminary mitigation design teams. Wetlands restoration or enhancement at this location is considered an additional potential benefit associated with improved floodplain access. Wetland functions and values within this system will be primarily beneficial for water quality conditions versus wildlife habitat.

Linover Park

The Linover Park site consists of property owned by Baltimore County and a private landowner, and State Highway Administration (SHA) right-of-way adjacent to the inner loop of I-695 (**Figure III-2C**). Stemmers Run flows parallel to I-695 across a farm field before turning sharply into Linover Park. The farm field has rubble-reinforced earthen levies that straighten the channel and restrict access to the floodplain (farm field). Another part of the channel, just west of Linover Park, is a failed section of concrete trapezoidal channel. Channel restoration opportunities include channel stabilization, floodplain reconnection and wetland restoration. The improvements would lessen the erosive force of Stemmers Run within Linover Park and improve aquatic and terrestrial habitats. This site provides approximately 1000 feet of stream restoration along Stemmers Run. Floodplain and/or wetland restoration may be feasible pending further field investigations. Mitigation efforts here would focus on stabilizing the northern (I-695 side) streambank including structures such as rock vanes to direct flows away from the north bank and restoring access to the floodplain along the south bank.

King Avenue

The King Avenue site is on an existing open field adjacent to both I-95 and King Avenue (**Figure III-2D**). This field is being actively farmed for corn, hay and contains a small vegetable garden. An intermittent channel (drainage ditch) was created to provide drainage for the farm field. A culvert draining portions of I-95 and Essex Community College drains into this site from beneath I-95. The combined flows of these two intermittent channels create a perennial channel, the South Fork of White Marsh Run, which flows along the toe of the existing I-95 roadway embankment in a concrete channel. Under the mitigation concept, the perennial portion of the stream would be relocated, due to fill from roadway widening, and set in a natural channel. The surrounding riparian area is targeted to be restored as forested wetland and forested upland buffer. The mitigation goals for this site are to re-establish a natural channel of approximately 800 feet of stream and one acre of forested wetland and to include some forested buffer in a headwater area of the South Fork of the White Marsh Run.

The potential replacement quantities for streams and wetlands at each site are summarized in **Table III-9 and Table III-10.**

Table III-9: Stream Mitigation Replacement Quantities

Mitigation Site	White Marsh Run	I-95/I-695 Interchange	Linover Park	King Avenue	Total
Intermittent	Unknown	0	50	300	350+
Perennial	6,000	2400	1000	500	9,900
Total Streams (linear feet)	**6,000+**	**2,400**	**1,050**	**800**	**10,250+**

Table III-10: Wetland Mitigation Replacement Quantities

Mitigation Site	White Marsh Run	I-95/I-695 Interchange	Linover Park	King Avenue	Total
POW	Unknown*	0	0	0	0+
PEM	Unknown*	0-.5 acre	0	0	0-0.5
PSS	Unknown*	0	0	0	0+
PFO	Unknown*	0	0.0-1.0 acre	0.5-1.0 acre	0.5-2.0
Total Wetlands (acres)	**4-10 acres****	**0-0.5 acre**	**0-1.0 acre**	**0.5-1.0 acre**	**4.5-12.5+**

* Further field study is required to determine potential mitigation opportunities concerning this particular type of system.
** NWI mapping shows up to 95 acres of wetlands of various types within this mitigation site of which it is estimated that 4-10 acres would be suitable as a combination of restoration, creation, enhancement and/or preservation upon incorporation of the final accepted mitigation package

Mitigation Commitments/ Milestones

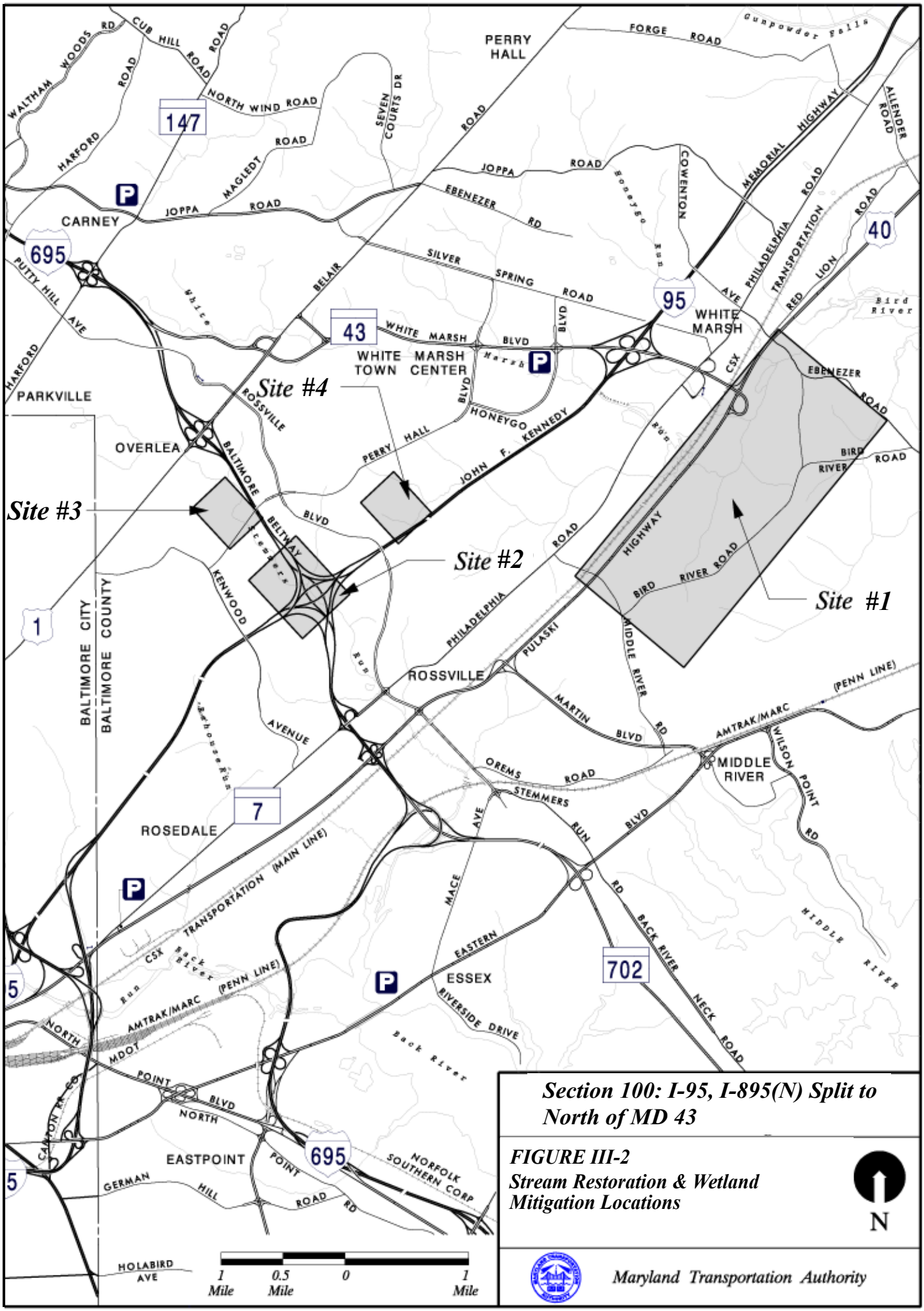
The four mitigation sites: White Marsh Run, I-95/I-695 interchange, Linover Park, and King Avenue vary in size and will be used to mitigate for various types of Section 100 impacts (i.e. streams, wetlands, floodplain, etc.). The White Marsh Site, being east of the project site and US 40, is the only one which has no dependence on the highway construction contracts. The mitigation efforts within I-695/I-95 will be intricately linked to those specific phases of work for the various overpasses and ramps. Both the Linover Park and King Avenue Sites are adjacent to Section 100 work areas of I-695 and I-95 respectively, though, are less dependent on roadway construction phasing.

Table III-11 describes the approximate milestones for each of the selected mitigation sites. Milestone windows may vary depending on both changes in roadway designs/ scheduling as well as potential changes to the final mitigation design package. The Authority will be able to provide a more definitive time schedule for each site at the 70% design level.

Table III-11: Mitigation Milestones

Mitigation Site	Related to Highway Construction	Estimated Construction Window	Stream	Stream Use and Closure Period*	Best Construction Window Starting**
White Marsh	none	18 months	White Marsh Run	Use I	Late Summer/Fall
I-695/I-95 Interchange	high	24 months	Stemmers Run	Use I	Late Summer/Fall
Linover Park	low	12 months	Stemmers Run	Use I	Late Summer/Fall
King Avenue	low	8 months	South Fork of White Marsh	Use I	Late Summer/Fall

* The closure Period for Use I waters is March 1 to June 15.
** Lower less flashy flows outside of closure period.



Section 100: I-95, I-895(N) Split to North of MD 43

FIGURE III-2
Stream Restoration & Wetland Mitigation Locations

Maryland Transportation Authority

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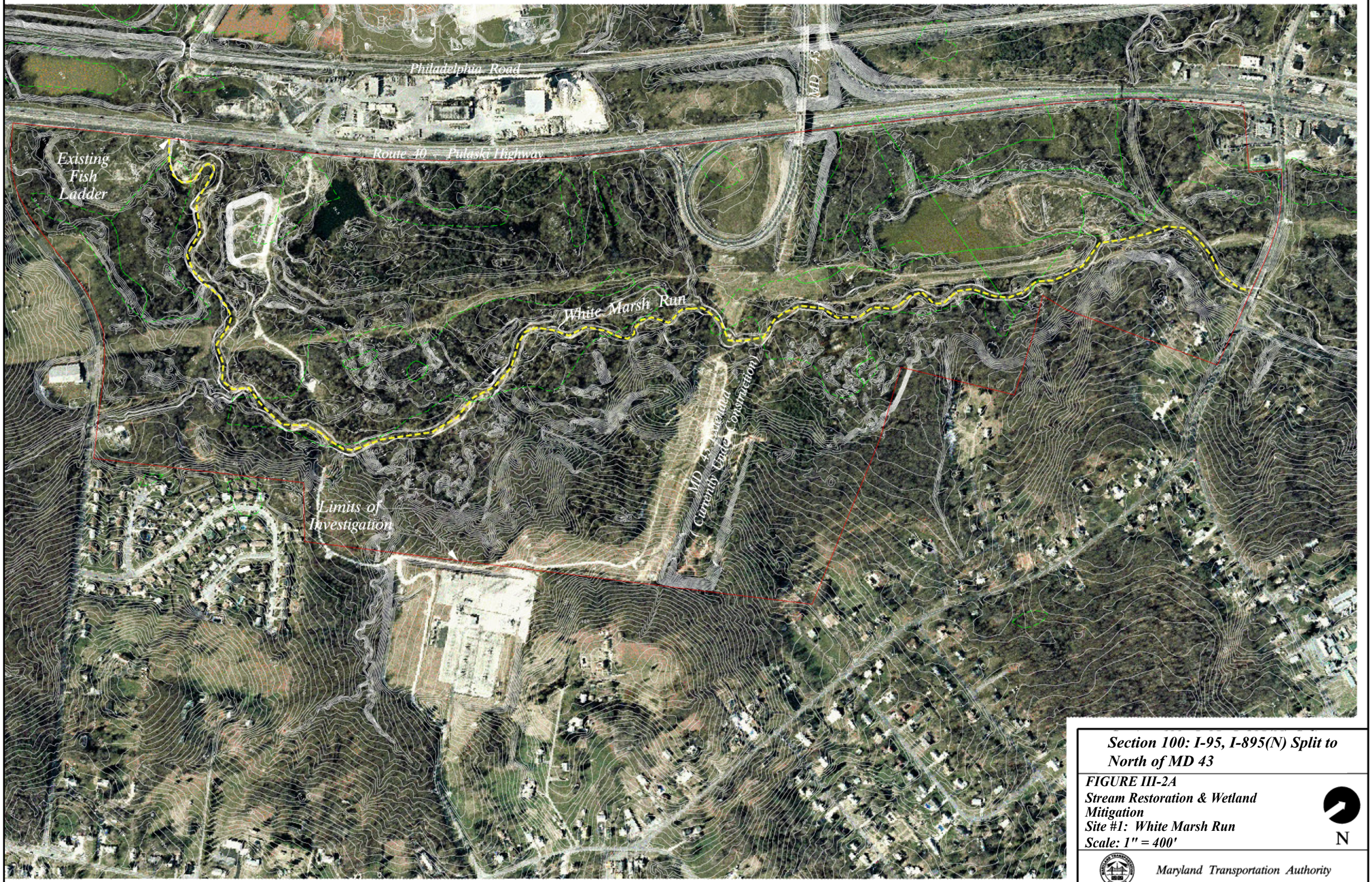

Section 100: I-95, I-895(N) Split to North of MD 43

FIGURE III-2A
Stream Restoration & Wetland Mitigation
Site #1: White Marsh Run
Scale: 1" = 400'

Maryland Transportation Authority

Note:
Entire Interchange will be Investigated for Stream Restoration, Floodplain Re-connection, Wetland and Riparian Buffer Establishment

Section 100: I-95, I-895(N) Split to North of MD 43

FIGURE III-2B
Stream Restoration & Wetland Mitigation
Site #2: I-695, I-95 Interchange
Scale: 1" = 400'

N

Maryland Transportation Authority

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Section 100: I-95, I-895(N) Split to North of MD 43

FIGURE III-2C

Stream Restoration & Wetland Mitigation

Site #3: Linover Park

Scale: 1" = 400'

Maryland Transportation Authority

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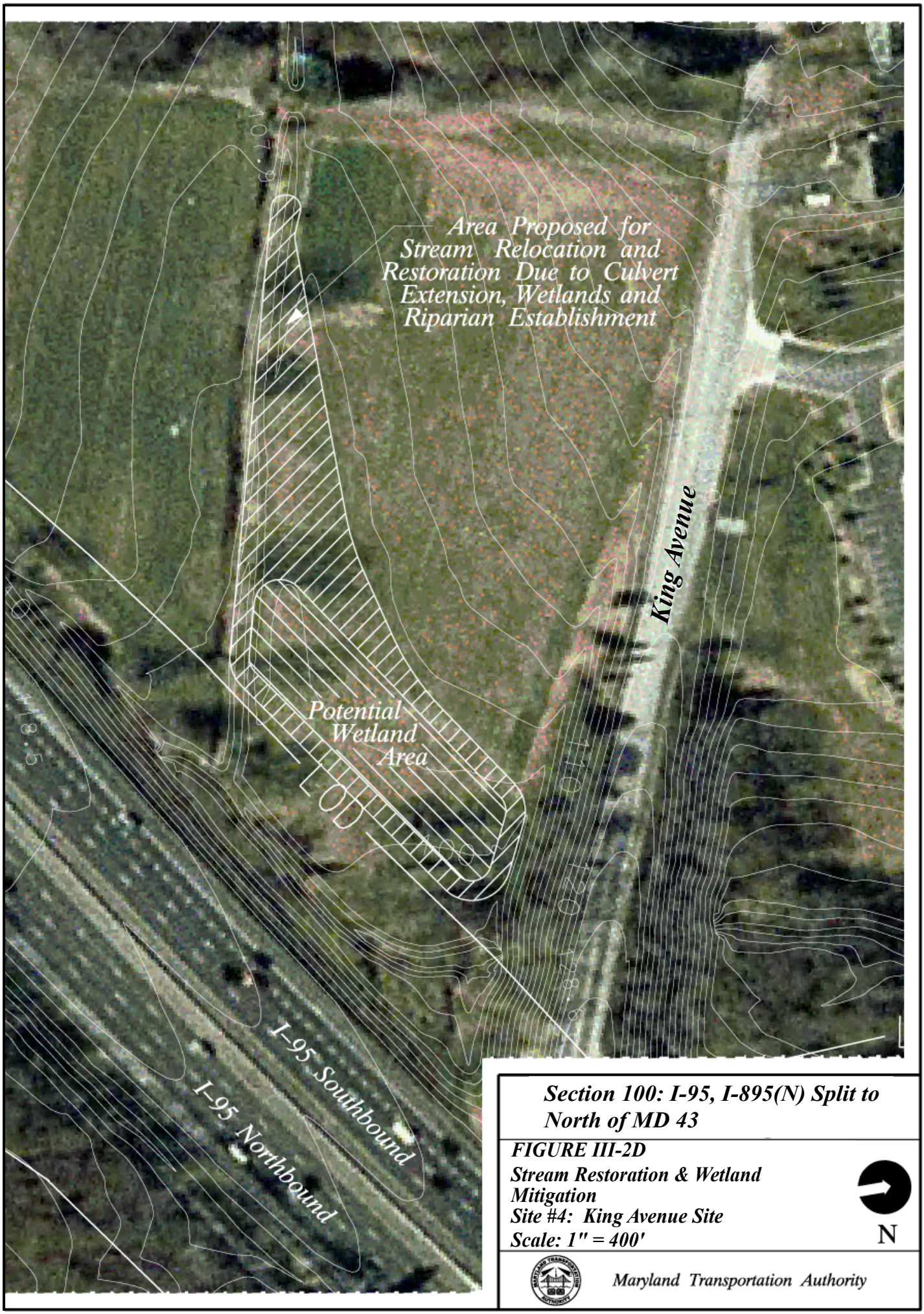

Section 100: I-95, I-895(N) Split to North of MD 43

FIGURE III-2D

Stream Restoration & Wetland Mitigation

Site #4: King Avenue Site

Scale: 1" = 400'

Maryland Transportation Authority

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D. Publicly Owned Parks and Recreation Areas

There would be no use of publicly owned public parks and/or recreation areas within the study area as a direct result of the Section 100 project; however temporary occupancy of portions of Linover Park and Cowenton Avenue Park would be necessary during the construction of the project. The Baltimore County Department of Recreation and Parks, as the agency with jurisdiction over both parks, has no objections to these temporary occupancies and has concurred with the proposed project.

Baltimore County has given written permission to allow the Authority to enhance Stemmers Run in Linover Park (Appendix D). The temporary occupancy is necessary to provide stream enhancements as part of the mitigation efforts for I-95 Section 100. The stream enhancement project in Linover Park is not a "use" under Section 4(f) of the U.S. Department of Transportation Act of 1966 because the work is consistent with the function of the existing parkland and is an enhancement to the park, and the Authority consulted with and received written concurrence from the municipality with jurisdiction over the park.

Similarly, Baltimore County has given written permission to remove a private driveway that leads to an access point to the Cowenton Avenue Park (Appendix D). Removal of the driveway is necessary due to the realignment of the Cowenton Avenue Bridge over I-95 and removal of impervious surface. This driveway is not currently used or planned for use by the park. The private driveway is located approximately 150 feet east of the recently constructed entrance to the park. The County property line runs down the middle of the driveway, with half of the driveway being owned by the County, and half the driveway being owned by a private landowner. Following removal of the private drive, the land currently owned by the County would remain under County ownership.

The impacts to Linover Park and Cowenton Avenue Park do not constitute "use" under Section 4(f) of the U.S. Department of Transportation Act of 1966 because the temporary occupancies:

- Will be of short duration and less than the time needed for construction of the project;
- Will not affect the ownership of the land (Baltimore County Department of Recreation and Parks will retain ownership of the areas) or result in the retention of long-term or indefinite interests in these properties for transportation purposes other than hiking or biking;
- Will not result in any temporary or permanent adverse change to the activities or features which are important to the purpose or function that qualifies the resources for protection under 4(f); and
- Will include a minor amount of land.
- Will result in land being restored to a condition that is at least as good as that which existed prior to the project.

E. Secondary and Cumulative Effects Analysis (SCEA) Summary

The SCEA used a geographic boundary and temporal limits to evaluate impacts to socio-economic, cultural, and natural environmental resources. The SCEA boundary was determined by overlaying a combination of individual socio-economic and natural resource sub-boundaries. In general, the other SCEA sub-boundaries maintain a reasonable proximity to the Area of Traffic Influence boundary, but also include portions of the census tract and sub-watershed boundaries.

A time frame of 55 years was selected for the SCEA (1970-2025). This time frame was chosen after reviewing historical events that took place in the project area, changes in population growth, availability of data, and the design year of the project.

There is no known development dependent on Section 100 therefore there are no secondary impacts associated with development. Land use is not anticipated to change substantially in the SCEA boundary within Baltimore City due to the Preferred Alternate. Land use within the City limits consists mainly of urbanized areas, and future development would concentrate on revitalization.

The Preferred Alternate will have a secondary effect on the growth rate of residential development Harford County and eastern Baltimore County. The Preferred Alternate would actually accommodate a slower growth rate than the General Purpose Lanes Alternate; therefore, secondary impacts associated with the growth rate would be minimal.

There will be secondary and cumulative impacts to several of the resources outline in the SCEA, including surface water/aquatic habitat, forest/terrestrial habitat, floodplains, wetlands, and archeological resources. Secondary and cumulative effects to natural resources will be adverse. However, any cumulative impacts to these resources will be regulated by applicable State, Local, and Federal laws for avoidance, minimization and/or mitigation. Secondary and cumulative impacts to community resources will be minimal because future impacts to communities would be directly related to local and regional growth, which is slower with the Preferred Alternate.

It is concluded that the Preferred Alternate will have direct, secondary and cumulative effects on socio-economic, cultural, and natural environmental resources. There will not be any secondary impacts related to development associated with the Preferred Alternate and all secondary and cumulative impacts to natural resources will be minimized by existing environmental regulations.