ENVIRONMENTAL ASSESSMENT

INTERSTATE 95

JFK SECTION 100

Section 100
John F. Kennedy Memorial Highway
(I-95, I-895(N) Split to North of MD 43)

FINAL

May 28, 2004

Prepared by:
Maryland Transportation Authority
for U.S. Department of Transportation /
Federal Highway Administration and
U.S. Army Corps of Engineers

Environmental Assessment (EA)

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

Baltimore City and Baltimore County, Maryland

Prepared by:

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For the:

U.S. Department of Transportation-Federal Highway Administration
in cooperation with
U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency

May 28, 2004

SECTION 100: I-95, I-895(N) SPLIT TO NORTH OF MD 43

Baltimore City and Baltimore County, Maryland

Environmental Assessment (EA)

Submitted Pursuant to 42 U.S.C. 4332 (2) and
CEQ Regulations (40 CFR 1500 (et.seq.))

by the Maryland Transportation Authority

for the
U.S. Department of Transportation – Federal Highway Administration and
in cooperation with
The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency

Thomas J. Osborne 5/24/04

MARYLAND TRANSPORTATION AUTHORITY Date
Thomas L. Osborne, Executive Secretary

5/24/04

FEDERAL HIGHWAY ADMINISTRATION Date
Nelson Castellanos, Division Administrator, Maryland Division

The purpose of the proposed action is to address capacity and safety needs on Section 100 and thereby improve access, mobility, and safety for local, regional, and inter-regional traffic, including passenger, freight, and transit vehicles. The study area for Section 100: I-95, I-895(N) Split to North of MD 43 (hereinafter referred to as Section 100), is approximately nine miles long, extending north along I-95 from just south of the I-895(N) split in Baltimore City, to the New Forge Road overpass in Baltimore County, just north of the MD 43 interchange. Section 100 is currently the most congested section of I-95 in Maryland, north of Baltimore City. The area south of MD 43 operates at Level of Service (LOS) F during the morning and evening rush hours, and is anticipated to operate at LOS E and F even during weekend peak periods by 2025. In addition, accident rates are increasing, especially in the vicinity of the urban I-895, I-695, and MD 43 Interchanges, where large volumes of merging, diverging, and weaving movements occur. This study examines safety and service improvements to reduce congestion on Section 100 by improving access, mobility, and safety. This study also examines opportunities to increase safety at the I-895, I-695 and MD 43 Interchanges, as well as along the I-95 mainline.

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LIST OF ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ADT	Average Daily Traffic
APE	Area of Potential Effect
ARDS	Alternates Retained for Detailed Study
ARMA	Maryland Air and Radiation Management Administration
AST	Aboveground Storage Tank
Authority	Maryland Transportation Authority
BMC	Baltimore Metropolitan Council
BMP	Best Management Practice
BRTB	Baltimore Regional Transportation Board
BWI	Baltimore Washington International Airport
CCA	Community Conservation Area
C-D	Collector-Distributor
CDP	Census Designated Place
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLRP	Constrained Long-Range Plan
CO	Carbon Monoxide
COMAR	Code of Maryland Regulations
CSIL	Candidate Safety Improvement Location
CSX	CSX Corporation
CZMA	Coastal Zone Management Act
dBA	Decibels
DBH	Diameter Breast Height
DEPRM	Department of Environmental Protection and Resource Management
DHHS	Department of Health and Human Services
DO	Dissolved Oxygen
DOE	Determination of Eligibility
EA	Environmental Assessment
EO	Executive Order
EPA	United States Environmental Protection Agency
ERNS	Emergency Response Notification System
ESA	Endangered Species Act
E&S	Erosion and Sedimentation
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIDS	Forest Interior Dwelling Species
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Administration
GIS	Geographic Information System

GPM	Gallons Per Minute
HOV	High Occupancy Vehicle
HUC	Hydrologic Unit Code
IBI	Indices of Biotic Integrity
ISA	Initial Site Assessment
JD	Jurisdictional Determination
JFK	John F. Kennedy Memorial Highway
JPA	Federal/State Joint Permit Application
LEDPA	Least Environmentally Damaging Practicable Alternate
LOD	Limits of Disturbance
LOS	Level of Service
LUST	Leaking Underground Storage Tank
MARC	Maryland Rail Commuter
MATE	Mid-Atlantic Transportation and Environmental
MBSS	Maryland Biological Stream Survey
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MDP	Maryland Department of Planning
MDOT	Maryland Department of Transportation
MEPA	Maryland Environmental Policy Act
MHT	Maryland Historical Trust
MOA	Memorandum of Agreement
MOT	Maintenance of Traffic
MREC	Middle River Employment Center
MTA	Maryland Transit Administration
MVMT	Million Vehicle Miles Traveled
NAC	Noise Abatement Criteria
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NRHP	National Register of Historic Places
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise Sensitive Area
NWI	National Wetland Inventory
O_3	Ozone
Pb	Lead
PCBs	Polychlorinated Biphenyls
PFA	Priority Funding Area
pH	potential of hydrogen
PM_{10}	Particulate Matter

ppm	parts per million
PSA	Preliminary Site Assessment
RC	Resource Conservation
RCRA-GEN	Resource Conservation and Recovery Act Generator
ROW	Right-of-Way
SCEA	Secondary and Cumulative Effects Analysis
SCS	Soil Conservation Service
SHA	Maryland State Highway Administration
SHA-OOTS	Maryland State Highway Administration, Office of Traffic and Safety
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
S/NAAQS	State and National Ambient Air Quality Standards
SPL	State Priority List
SR	Sensitive Receptor
SSPRA	Sensitive Species Project Review Areas
SWL	Solid Waste Landfill
SWM	Storm Water Management
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Program
TNM	Traffic Noise Model
URDL	Urban Rural Demarcation Line
USACE	United States Army Corps Of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank
VEIP	Vehicle Emissions Inspection Program
WUS	Waters of the United States

SUMMARY

A. Administrative Action

( ) Environmental Impact Statement
(X) Environmental Assessment
( ) Finding of No Significant Impact
( ) Section 4(f) Evaluation

B. Additional Information

Additional information concerning this project may be obtained by contacting the following individuals:

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C. Description of Action

This Environmental Assessment (EA) presents the results of engineering and environmental studies to improve a section of I-95 in Maryland, from just south of the I-95/I-895(N) split in the northeast side of Baltimore City, to the New Forge Road overpass, just north of the MD 43 Interchange in Baltimore County. The planning study and associated documentation have been performed and completed in accordance with the National Environmental Policy Act (NEPA), and address additional Federal and State laws including: Section 404 of the Clean Water Act, Section 106 of the National Historic Preservation Act of 1966, Title VI of the 1964 Civil Rights Act, the Clean Air Act as amended in 1990, Executive Order (EO)) 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, the Maryland Environmental Policy Act (MEPA), the Uniform Relocation Assistance and Real Property Acquisition Policies Act as amended in 1987, Smart Growth Priority Funding Areas Act of 1997, and the 1992 Maryland Economic Growth, Resource Protection, and Planning Act.

The Section 100: I-95, I-895(N) Split to North of MD 43 project is one of four independent projects identified in the *I-95 Master Plan, I-895 Split(N) to the Delaware State Line* (hereinafter referred to as the I-95 Master Plan), which was adopted by the Maryland Transportation Authority (Authority) in April 2003. The approximately nine-mile long study area is located in Baltimore City and Baltimore County, Maryland, and

extends north along I-95 from south of the I-895(N) split to the New Forge Road overpass (***Figures I-1 and I-2***).

The purpose of the proposed action is to address capacity and safety needs on Section 100 and thereby improve access, mobility, and safety for local, regional, and inter-regional traffic, including passenger, freight, and transit vehicles. Section 100 is currently the most congested section of I-95 in Maryland, north of Baltimore City. The area south of MD 43 operates at Level of Service (LOS) F during the morning and evening rush hours, and is anticipated to operate at LOS E and F during weekend peak periods by 2025. In addition, accident rates are increasing, especially in the vicinity of the urban I-895, I-695, and MD 43 Interchanges, where large volumes of merging, diverging, and weaving movements occur.

D. Description of Alternates

The Authority, in cooperation with the Federal Highway Administration (FHWA) and the Maryland Department of Transportation (MDOT), developed the I-95 Master Plan study approach to comprehensively identify long-range transportation needs and establish clear goals for system maintenance, preservation and enhancement, while ensuring the development of environmentally sensitive and intermodal-friendly solutions for the John F. Kennedy Memorial Highway (JFK).

The Authority adopted the I-95 Master Plan in April 2003. It identified four independent projects including:

Section 100: I-95, I-895(N) Split to North of MD 43
Section 200: North of MD 43 to North of MD 22
Section 300: North of MD 22 to North of MD 222
Section 400: North of MD 222 to the Delaware State Line

Throughout the I-95 Master Plan process, the Authority coordinated with local, State, and Federal regulatory and resource agencies. This coordination resulted in agency concurrence on the need for four independent projects and their termini, as well as the alternates to be carried forward for each. Section 100 was the first independent project, identified in the I-95 Master Plan, to be initiated. Concurring agencies included:

- FHWA,
- Federal Transit Administration[1] (FTA),
- United States Environmental Protection Agency (EPA),
- United States Army Corps of Engineers (USACE),
- United States Fish and Wildlife Service[2] (USFWS),
- National Marine Fisheries Service (NMF),

- Maryland Department of the Environment (MDE), and
- Maryland Department of Natural Resources (DNR).

[1] In February 2002, FTA requested that they be considered a commenting agency.

[2] In February 2002, USFWS informed the Master Plan study team that they could no longer staff the study and should be denoted as having taken no action.

During the I-95 Master Plan studies, six concepts were analyzed for each of the four independent projects. Based on this analysis, Concepts C-2, C-3, and C-4 were dismissed because they were found to be unreasonable or unable to meet the project needs. Concepts C-1, C-5, and C-6 were recommended for further study at that time. The FHWA, EPA, USACE, NMFS, MDE, and DNR concurred upon the range of alternates carried forward into project planning and preliminary design (i.e., No-Build, Concept C-5, and Concept C-6).

Based on the I-95 Master Plan Concepts recommended for further study, preliminary engineering studies were performed, along with environmental analysis/studies. This resulted in the development of preliminary alternates. Detailed traffic, engineering, and environmental studies were then performed, and the preliminary designs were revised to better meet the project needs and minimize environmental impacts. The revised designs represented the Alternates Retained for Detailed Study (ARDS). The following is a summary of the alternates considered in detail during project planning.

1. No-Build Alternate

The No-Build Alternate would include normal maintenance and minor safety improvements. There would be no increase in roadway capacity, and the typical section would remain four lanes in each direction from the I-895(N) split to approximately the New Forge Road overpass. As a result, LOS would continue to degrade, and there would be no reduction in the accident rate.

2. General Purpose Lanes Alternate

The General Purpose Lanes Alternate would include the provision of additional general purpose lanes to accommodate the projected traffic demand. This alternate originally included collector-distributor (C-D) roadways, as per the I-95 Master Plan Concept C-6 from which this alternate was derived. However, studies indicated that the addition of C-D roadways in Section 100 would not improve the alternate's ability to meet the project needs, would not accomplish the intended function, and would increase the footprint, thereby increasing the natural, cultural, and socio-economic impacts of the alternate. Inclusion of C-D lanes was therefore dismissed during the preliminary analysis.

In addition, this alternate originally included two interchange options for the I-895, I-695, and MD 43 Interchanges. Option 2A at the I-895 Interchange would retain I-895 as the

through movement, while Option 2B would make I-95 the through movement. Option 2A for the I-695 Interchange would remove the braided roadways on both I-95 and I-695, while Option 2B would retain the braiding on both roadways. Option 2A at the MD 43 Interchange would provide a single exit point on each approach, while Option 2B would provide a partial cloverleaf configuration.

The interchange options were compared based on the analysis of: 1) operations/LOS; 2) design standards/exceptions; 3) environmental impacts; 4) displacements; 5) major utility involvement; 6) maintenance of traffic; 7) construction costs; and 8) maintenance considerations. For each interchange, the option that best met these criteria was selected for detailed study. The interchange options selected for the General Purpose Lanes Alternate, based on these criteria, included I-95/I-895 Interchange Option 2B, I-95/I-695 Interchange Option 2A, and I-95/MD 43 Interchange Option 2B. This alternate would operate at weekday and weekend LOS E and D, respectively.

Using the selected interchange options, detailed engineering was conducted, and the General Purpose Lanes were refined at the ARDS stage to incorporate six general purpose lanes throughout the corridor.

3. Managed Lanes Alternate

The Managed Lanes Alternate would include two managed lanes per direction along I-95 from I-895 to north of MD 43, plus four additional general purpose lanes. The Managed Lanes Alternate could operate under a single management strategy 24-hours per day, or on a "time-share basis" with different restrictions at different times of day. Management strategies could include restrictions at access locations (ramps), by time of day (peak/off-peak), by vehicle-type (trucks/buses), by type of use (commercial/transit), or by price (variable or fixed). Managed lanes would be designed for flexibility so that management strategies could be modified over time to maximize person-moving capacity, optimize vehicle carrying capacity, and achieve transportation and community goals.

Three management strategies: priced lanes, truck only lanes, and transit only lanes, were evaluated individually and in combination. The truck only and transit only strategies provided opportunities to improve safety, to provide reliable transit service times and to address the "just-in-time" delivery practices of many business sectors. A pricing strategy, which permits trucks and transit vehicles to use the managed lanes, provides opportunities for travel demand management, safety, delivery, revenue and transit benefits. A peak period pricing and off-peak truck only and bus only lane strategy was also considered and a similar mix of potential benefits identified.

Management strategies may be combined and modified to achieve changing regional transportation goals. Maximum flexibility of a managed lane system will best meet changing needs for the safe and efficient movement of people and goods across all transportation modes. One of the keys to the success of the managed lane concept is the ability to alter the operation of the lanes in ways that keep traffic flowing and providing

flexibility, not only in the day-to-day operations of the lanes, but in situations where isolated incidents such as major accident call for the lanes to be open to more or different user groups.

In general, selection of a management strategy will be based on optimized operational efficiency, safety, congestion management and revenue production. The initial strategy will most likely include a form of pricing which is considered during the evaluation of this alternative.

The managed lanes would be separated from the General Purpose Lanes by a physical barrier from the I-95/I-695 Interchange to north of MD 43. South of the I-95/I-695 Interchange, where right of way is constrained, the managed lanes would be separated from the general purpose lanes by a four foot buffer area. Vehicles would access the Managed Lanes directly through dedicated Managed Lanes on-ramps and off-ramps.

This alternate originally included collector-distributor (C-D) roadways, as per the I-95 Master Plan Concept C-5 from which this alternate was derived. However, studies indicated that the addition of C-D roadways in Section 100 would not improve the alternate's ability to meet the project needs, and would increase the footprint, thereby increasing the natural, cultural, and socio-economic impacts of the alternate. Inclusion of C-D lanes was therefore dismissed during the preliminary analyses.

In addition, this alternate originally included two interchange options for the I-895 and MD 43 Interchanges, and three options at the I-695 Interchange. I-95 would be the through movement under Options 3A and 3B at the I-895 Interchange. However, Option 3A would require the managed lanes of I-895 to span over the I-95 general purpose lanes before merging with the I-95 general purpose lanes, while Option 3B would allow the managed lanes of I-895 to stay within the median (no spanning required). Option 3A at the I-695 Interchange would remove the braided mainline of I-95, while Option 3A Modified would remove the braided mainlines on both I-95 and I-695.

In comparison, Option 3B for the I-695 Interchange would simply add managed movements to General Purpose Interchange Option 2B. Options 3A and 3B at the MD 43 Interchange would both provide single-lane ramps for all movements to and from the managed lanes. However, in an effort to minimize impacts to the traffic flows on MD 43, Option 3B would realign the MD 43 lanes to avoid the managed lane intersection, thereby requiring two additional bridge structures over I-95.

The interchange options were compared based on the analysis of: 1) operations/LOS; 2) design standards/exceptions; 3) environmental impacts; 4) displacements; 5) major utility involvement; 6) maintenance of traffic; 7) construction costs; and 8) maintenance considerations. For each interchange, the option that best met these criteria was selected for detailed study. The interchange options selected for the Managed Lanes Alternate, based on these criteria, included I-95/I-895 Interchange Option 3B, I-95/I-695 Interchange Option 3A Modified, and I-95/MD 43 Interchange Option 3A. Using the

selected interchange options, detailed engineering was conducted and the Managed Lanes Alternate was refined at the ARDS stage. The Managed Lanes Alternate retained for detailed study would operate at LOS E to LOS F in the general purpose lanes and at or above LOS D in the managed lanes. The level of service in the general purpose lanes would depend on the management strategy implemented in the adjacent managed lanes. Specifically, the general purpose lanes are expected to operate at LOS E if the managed lanes are tolled, and are expected to operate at LOS F if the managed lanes are operated as non-tolled, truck-only lanes or transit only lanes.

The managed lanes strategies could meet a specific individual or a combination of transportation goals. These achievable benefits include: increasing flexibility, providing choices, optimizing highway efficiency, providing reliable travel times, promoting transit, promoting public safety, reducing incident response times, improving work zone safety, and generating revenue.

On May 4, 2004, the Maryland Secretary of Transportation announced an Express Toll Lanes initiative. Under this initiative, the Secretary has directed the Maryland Department of Transportation and Maryland Transportation Authority to consider implementing Express Toll Lanes on several existing facilities in Maryland, including I- 95. The Express Toll Lanes initiative involves the construction of new tolled lanes adjacent to existing free lanes. Tolls would be collected electronically, without the use of toll booths, and would vary by time of day and demand.

The Managed Lanes Alternate, as defined in this document, would allow for a wide range of management strategies to be implemented, including the Express Toll Lanes concept. The General Purpose Lanes Alternate would not allow for tolling and thus is not compatible with the Secretary's policy favoring the establishment of Express Toll Lanes.

E. Summary of Environmental Impacts

Table S-1 provides a summary comparison of impacts associated with the alternates considered for the Section 100 Project. The General Purpose Lanes Alternate would displace six residential structures and seven residential outbuildings, and would require acquisition of approximately 68.5 acres of land. The Managed Lanes Alternate would displace seven residential structures and 12 residential outbuildings, and would require acquisition of approximately 97.7 acres of land. No community facilities would be impacted by either Build Alternate. Three of the 12 outbuilding displacements associated with the Managed Lanes Alternate would be located at the Baltimore County Community College – Essex Campus. Two of these buildings are trailers that appear to be used for storage associated with the maintenance facility. The third building is a house-like structure that does not appear to be in use.

Table S-1. Summary of Impacts

RESOURCE CATEGORY	No-Build Alternate	General Purpose Lanes Alternate	Managed Lanes Alternate
Residential (acre)	0	18.8	29.0
Commercial (acre)	0	11.5	19.1
Other (acre)	0	38.2	49.6
TOTAL ROW (acre)	0	68.5	97.7
Residential Displacements (number)	0	6 residences 7 outbuildings	7 residences 12 outbuildings
Commercial Property Structural Displacements (number)	0	0	0
Wetlands (acre)	0	5.1	6.4
Stream Impacts (linear feet)	0	11,114	15,956
Floodplain (acre)	0	39.4	44.9
Woodland (acre)	0	155.7	210.6
Threatened/Endangered Species Impacts (species)	0	0	0
NR/NRE Historic Sites Impacted (number)	0	0	0
NR/NRE Archaeological Sites Impacted (number)	0	0	1
Noise Impacts (number)	16 NSAs	17 NSAs	17 NSAs
Air Quality Impacts (sites exceeding CO S/NAAQS)	0	0	0
Section 4(f) Resource Impacts (acre)	0	0	0
COST ESTIMATES			
Construction Costs ($million)	96.9	558.4	824.5

Neither of the Build Alternates would require land acquisition from historic sites or from any publicly owned parks, recreation areas, or wildlife or waterfowl refuges. In addition, neither of the Build Alternates would result in proximity impacts that substantially impair the protected features, activities, or attributes of any such properties. Therefore, approval under Section 4(f) of the U.S. Department of Transportation Act of 1966 would not be required for any of the alternates. In addition, based on air quality analysis completed to date, neither of the Build Alternates would cause or contribute to an exceedance of the State or National Ambient Air Quality Standards. None of the alternates would impact any Federally-listed threatened or endangered species, as no Federally-listed species exist within the study area.

Both of the Build Alternates would require grading for the construction of additional lanes, resulting in minor soil erosion and sedimentation. In addition, several stream crossings would be required, thereby resulting in stream impacts. Stream impacts range from approximately 11,000 for the General Purpose Lanes Alternate to 16,000 linear feet for the Managed Lanes Alternate. The nature of these impacts primarily includes culvert extensions, channel relocations, filling of waters or piping of waters between existing culverts.

Wetlands would also be impacted by both Build Alternates, as would woodlands and floodplains. The majority of wetland impacts that would result from either of the Build Alternates would occur from the widening of I-95 and I-695, and reconfiguration of the I-95/I-695 Interchange. In general, the widening of I-95 and I-695 would result in filling wetland systems (in whole or in part, depending on the system) that have hydrology linked to existing roadway drainage. The primary functions of these wetlands are the sequestration of nutrients, treating toxicants and sediments washed off the roadway and slowing infiltrating runoff into the water table.

Wetlands in the vicinity of the I-695/I-95 Interchange and adjacent to Honeygo Run would be impacted by new, proposed roadway embankments. The wetlands impacted at these locations mainly function in providing floodwater storage from Stemmers Run and Honeygo Run.

The natural and beneficial floodplain values of Moores Run, Redhouse Creek, Stemmers Run, White Marsh Run, Honeygo Run and Lower Gunpowder and its tributaries would be impacted in locations where the Build Alternates would fill and/or narrow the floodway and the 100-year floodplain.

Woodland impacts would range from approximately 155 acres for the General Purpose Lanes Alternate to 210 acres for the Managed Lanes Alternate. Since the Build Alternates would generally involve widening along existing roadway alignment, woodland impacts would be primarily limited to existing forest edge as opposed to more pristine forest interior.

In general, the Managed Lanes Alternate would result in somewhat greater direct impacts to environmental resources. This is due to the additional footprint needed to provide the additional shoulders and barriers. However, managed lanes could provide long term environmental benefits by modifying travel behavior and reducing the need for future highway widening and its associated environmental impacts. By creating a transportation environment that maintains stable travel speeds, managed lanes could also provide short-term environmental benefits such as a reduction in vehicle emissions.

F. Status of Compliance with Regulatory Requirements

Both federal and state laws govern the environmental review requirements applicable to the Section 100 project. This project requires federal approvals from both the FHWA and the USACE. FHWA approval is required for an Interstate access point modification, and USACE approval is required for a Section 404 permit. In addition, this project requires compliance with other applicable federal environmental laws, including NEPA. As previously stated, the FHWA is the lead federal agency for this project, and the USACE is a cooperating agency. Although all agencies involved have independent regulatory obligations, the Section 100 project is being conducted in a manner consistent with the May 2000 Streamlined Guidelines developed by the Mid-Atlantic Transportation and Environmental (MATE) Task Force and consistent with TEA-21's call for improved and earlier coordination among transportation decision-making agencies. As such, the streamlining efforts for this project will allow the federal/state lead agencies (FHWA and the Authority) as well as the cooperating agencies (USACE and the EPA) to satisfy their respective obligations through a single, integrated and streamlined process.

This project will adhere to the following major federal regulatory requirements:

Section 106 of the National Historic Preservation Act, as amended: Section 106 requires that, prior to approval of a project by a federal agency, the agency involved must consider the project's effects on any district, site, building, structure or object that is included or eligible for inclusion in the National Register of Historic Places (NRHP), and give the Advisory Council on Historic Properties an opportunity to comment with regard to the project. Measures to minimize or mitigate adverse effects must be developed in consultation with the State Historic Preservation Officer (SHPO) and other interested parties and may be memorialized in a Memorandum of Agreement (MOA).

Cultural resource studies/surveys for historic architectural resources and archaeological resources for the Section 100 project were conducted in consultation with the Maryland Historical Trust (MHT) and the SHPO, and in accordance with relevant State guidelines (viz. MHT 2000; Shaffer and Cole, 1994). Consulting parties were identified in December 2003, and coordination with those parties to identify historic resource information is ongoing. Additional details regarding the Effect Determination can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Historic Context and Determination of Eligibility and Effects Report* which was submitted to the SHPO for concurrence on April 6, 2004 (***Appendix C***).

Studies were performed to identify archaeological resources and the alternates' potential effects on these resources. The findings of these studies were documented in the *Section 100: I-95, I-895(N) Split to North of MD 43 Phase I Archaeological Survey* prepared for this project. Concurrence was requested from the SHPO in a letter submitted April 6,2004 (***Appendix C***). As of May 10, 2004, concurrence had not been received from the SHPO. Phase I testing within the Area of Potential Effect (APE) identified one

potentially significant archeological resource – the Smith Site (18BA516). A Draft Memorandum of Agreement (MOA) regarding the Smith Site has been prepared and submitted to the SHPO and FHWA for approval (***Appendix D***). The MOA describes steps to be taken to further evaluate the Smith Site (Phase II studies), as well the possible mitigation of effects to the site. Additional studies will be conducted during final design in accordance with the MOA. For further discussion regarding Section 106 resources and potential impacts, see Chapter IV-D.

Section 404 of the Clean Water Act: Section 404 of the Clean Water Act (CWA) prohibits the discharge of dredged or fill material into waters of the United States without a permit. The agency with permitting authority under Section 404 is the USACE. In making permit decisions, the USACE must follow guidelines issued by the EPA under Section 404(b)(1) of the CWA. One key element of the Section 404(b)(1) Guidelines is the requirement that a Section 404 permit can be granted only for the practicable alternative that has the least impact to the aquatic ecosystem, unless that alternative has other significant adverse environmental impacts. This requirement is commonly known as the requirement to select the 'least environmentally damaging practicable alternative' ('LEDPA')."

The Authority will prepare/procure a Federal/State Joint Permit Application (JPA) upon final selection of an alternate in accordance with Section 404 of the CWA and Maryland State regulations including, Maryland State Programmatic General Permits (MDSPGP-2), USACE individual permits, MDE Water Quality certifications and individual wetland/waterway construction permits. Letters of Authorization (LOA) will also be prepared upon final alternate selection. For further discussion regarding Section 404 compliance and impacts to waters of the United States, see Chapter IV-E, subsection 3.

Air Quality Conformity: Transportation conformity is a requirement of the federal Clean Air Act, meant to insure that air quality concerns are factored into State and local transportation planning and decision-making. The Clean Air Act regulates emissions of six criteria pollutants that pose a danger to human health and the environment. The goal of the Clean Air Act is for nonattainment areas to improve air quality to achieve compliance with the National Ambient Air Quality Standards (NAAQS), within specified time periods, and for attainment and maintenance areas to maintain air quality in accordance with the NAAQS. The vehicle for achieving this objective is the State Implementation Plan (SIP).

The Section 100 study area is located within the Metropolitan Baltimore Intrastate Air Quality Control Region. This region is designated as a severe non-attainment area for ozone. The Authority is currently coordinating with the Baltimore Metropolitan Council (BMC) regarding inclusion of the Section 100 project into the new cycle for the Baltimore Region Transportation Improvement Program (TIP) 2005-2009. Conformity determination for the 2005-2009 TIP is scheduled for July 2004.

Section 100 is currently included in the 2001 Baltimore Regional Transportation Plan for illustrative purposes. It is anticipated that the Section 100 project will be included in the new long-range plan, Transportation 2030, which is scheduled for federal approvals in February 2005. The conformity status of the long-range plan will be determined concurrently with the conformity for the TIP in July 2004. Upon inclusion in the regional TIP, the project will also be incorporated into the statewide SIP. For further discussion regarding air quality conformance, see Chapter IV-G.

Executive Order (EO) No. 12898: EO No. 12898 of 1994: *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, requires that federal agencies be responsible for reviewing their programs and other activities to determine and prohibit any disproportionately high adverse effects on the human environments in low-income or minority communities. EO 12898 is implemented through several different regulations including the environmental justice orders of the United States Department of Transportation (USDOT) and the Federal Highway Administration (FHWA). The USDOT strategy ensures that the provisions of EO 12898 are integrated into the relevant existing guidelines used in the project planning and public participation processes. FHWA's order requires that specific research and related data collection be conducted to provide information on environmental justice concerns.

Four potential environmental justice communities have been identified within the study area. It has been determined that none of the alternates would disproportionately affect these communities. Coordination and outreach to these communities will continue throughout the planning, design and construction phases of the project. For further discussion regarding Environmental Justice, see Chapter IV-A, subsection 3.

G. Comparison of Alternates

The following discussion is a comparison of the General Purpose Lanes and Managed Lanes Alternates, based on five categories of evaluation criteria including ability to meet purpose and need, environmental impacts, operational efficiency, fiscal responsibility, and regulatory compliance. The Section 100 Alternates have been developed in compliance with NEPA regulations as well as other applicable federal and state regulations.

1. Ability to Meet Purpose and Need

Both build alternates would meet the purpose and need of the project by adding additional highway capacity, thereby addressing travel demand, and improving access, mobility and safety.

a. Congestion

The No-Build Alternate would not provide an increase in capacity. The typical section would remain the same as the current configuration, and no additional lanes would be added. Therefore, this alternate would not reduce congestion.

The General Purpose Lanes Alternate would add two new general purpose lanes in each direction on existing I-95, and would operate at LOS E during weekday peak periods. The additional lanes proposed with this alternate would increase the capacity of I-95 within Section 100; however, all drivers would experience decreasing benefits as traffic volumes grow over time. In addition, the facility would not provide an uncongested option for time-sensitive trips.

In comparison, the Managed Lanes Alternate would provide two managed lanes that would operate at LOS D or better during weekday peak periods, thereby providing consistent travel conditions and maximizing highway throughput. However, the general purpose lanes would be slightly more congested under the Managed Lanes Alternate than they would under the General Purpose Lanes Alternate.

b. Safety

The No-Build Alternate would not involve an increase in capacity. The typical section would remain the same as the current configuration, and no additional lanes would be added. Therefore, this alternate would not improve existing safety conditions, which may deteriorate as congestion levels increase.

The General Purpose Lanes Alternate would consist of six contiguous lanes in each direction. This could generate difficulty for disabled vehicles trying to access the shoulder, and would increase the number of lanes that a driver must traverse to exit the highway. The general purpose lanes would improve safety by eliminating the left side merges and diverges and replacing them with single point right side ramps. This alternate would reduce the level of congestion over the No-Build alternate, thereby assisting with the reduction of congestion-related accidents on this section.

The Managed Lanes Alternate would consist of two contiguous managed lanes and four contiguous general purpose lanes in each direction, with a concrete traffic barrier separating the two roadway types. It is anticipated, that the managed lanes would operate at LOS D or better, thereby allowing for gaps in traffic where vehicles can switch lanes to pass other drivers. By separating the general purpose lanes and providing a maximum of four contiguous lanes, safety would be enhanced through a reduction of lanes to be traversed when entering or exiting, and allowing disabled vehicles to more easily access the shoulder. In addition, the provision of managed lanes with direct access ramps from the intersecting highways could allow for the separation of vehicles by size, and/or reduce the number of conflict points between vehicles, thereby providing opportunities for improved public safety.

2. Environmental Impacts

a. Natural and Human Environment

No additional lanes would be added under the No-Build Alternate. Thus, there will be no direct impact to natural environmental features such as wetlands, streams, floodplains, or wildlife habitat. However, noise levels would increase as congestion gradually increases. Increased congestion would also lead to gradual degradation of the quality of life and economic environment in surrounding communities, as travel along I-95 becomes more difficult.

The General Purpose Lanes Alternate has a slightly smaller footprint than the Managed Lanes Alternate, and thus would have a proportionally smaller direct impact on environmental features.

The Managed Lanes Alternate could provide long term environmental benefits by modifying travel behavior and reducing the need for future highway widening and its associated environmental impacts. By creating a transportation environment that maintains stable travel speeds, managed lanes could also provide short-term environmental benefits such as a reduction in vehicle emissions. It is anticipated that the Managed Lanes Alternate would produce a lower rate of residential development outside of the Priority Funding Areas of Baltimore and Harford Counties than the General Purpose Lanes Alternate through 2025. Neither build alternate would cause a change the currently designated geographical pattern of residential development in the region.

A detailed comparison of the natural and human environmental impacts are included in Chapter IV: *Environmental Consequences*.

b. Land Use Impacts

The No-Build Alternate will have no effect on land use within the study area. Both Build Alternates will directly result in minor amounts of residential, commercial, forested, and open space land to transportation use. The General Purpose Lanes Alternate would result in less direct conversion of land use than the Managed Lane Alternate.

The build alternates would result in increased rate of conversion to residential land use in Baltimore and Harford Counties. The Managed Lanes Alternate would generate lower rate of conversion to residential land use than the General Purpose Lanes Alternate.

A detailed comparison of the natural and human environmental impacts is included in Chapter IV: *Environmental Consequence*

3. Operational Efficiency

a. Incident Management

The No-Build Alternate would not reduce congestion or increase capacity. The highway would be maintained but no significant improvements would be provided therefore, incident management would not be improved.

The General Purpose Lanes Alternate would increase capacity and reduce congestion, providing LOS E during the weekday peak period. Shoulder width would be increased to fourteen feet providing improved access and a wider staging area for emergency responders. Overall, incident management on the highway would be improved by the General Purpose Alternate.

The Managed Lanes Alternate would offer the greatest benefit for incident management. The managed lanes within the median would operate at LOS D. Additional (4) and wider fourteen foot shoulders would be provided with the Managed Lane Alternate, providing improved access and a wider staging area for emergency responders. In addition, physical separation of the general purpose and managed lanes would provide adjacent detour routing and/or access for emergency services. The separated roadways would also allow for the maintenance of traffic flow during incidents.

b. Facility Maintenance

The No-Build Alternate would not improve congestion or capacity. The typical section would not be altered and no lanes would be added. Based on this assessment, facility maintenance would not be improved by the No-Build Alternate.

The General Purpose Lanes Alternate would include the addition of two new general purpose lanes, thereby providing additional lanes for redirection of traffic during maintenance activities.

The Managed Lanes Alternate would provide the best conditions for facility maintenance, because off-peak closures of the managed or general purpose roadways could reduce conflicts between motorists and maintenance or construction activities.

c. Enforcement

The No-Build Alternate will provide decreasing opportunities for enforcement activities. As congestion increases, the ability of police units to pull motorists over to the highway shoulder decreases. The General Purpose Lanes Alternate will reduce congestion, thereby increasing opportunities for safer roadside activities. The Managed Lanes Alternate, with a maximum separation of 2 lanes from an available shoulder, will facilitate roadside patrols and enforcement.

d. Intermodal Access

Section 100 provides access to the Port of Baltimore, Baltimore Washington International (BWI), and Martin State Airports and Amtrak rail service. Section 100 is also used for access to public transit facilities such as park-and-ride lots and bus services. In order to provide dependable intermodal connectivity, it is important that highway travel times and thus bus service times remain fairly consistent, and that those times be perceived as reasonable by users.

The No-Build Alternate would not involve an increase in capacity. The typical section would remain the same as the current configuration. Under this alternate, bus transit would not experience any substantial benefits, as travel times would increase with congestion increases over time.

The General Purpose Lanes Alternate would involve the addition of lanes as necessary to accommodate the projected traffic volumes. This alternate would have a moderate effect on bus transit in the Section 100 corridor. Although the capacity of I-95 would increase in Section 100, drivers would experience decreasing benefits as traffic volumes grow over time.

The Managed Lanes Alternate would involve the addition of two managed lanes per direction between I-895 and north of MD 43. This alternate would also include four general purpose lanes to accommodate projected traffic volumes. Bus transit could benefit from the implementation of managed lanes. Managed lane strategies preserve a portion of the highway capacity for priority needs by providing opportunities for eligible vehicles, such as buses, to maintain generally free-flow travel speeds on designated lanes. By utilizing the managed lanes, buses could benefit from the higher levels of service that could be provided in the managed lanes. Managed lanes could improve the attractiveness of transit services by providing reliable and predictable transit service times. Therefore, by implementing managed lanes, bus ridership would likely increase. Access to and from the managed lanes, at interchanges where transit service hubs are planned, are accommodated in the design of the Managed Lanes Alternate.

Based on this assessment, the Managed Lanes Alternate would best provide for intermodal access because it is anticipated that the managed lanes would operate at LOS D or better, thereby providing faster, more consistent travel conditions as compared to the General Purpose Lanes Alternate, which would operate at LOS E during weekday peak periods.

4. Fiscal Responsibility

The term No-Build is often misleading. It does not mean that there would be no cost associated with this alternate. Rather, it means that no funds would be expended to increase the capacity of the roadway. There would still remain significant costs associated with maintaining the facility. This would include activities such as roadway

resurfacing, bridge replacement, signing, lighting, pavement markings, etc. The estimated cost for the No-Build Alternate, major maintenance activities, is $96.9M. The General Purpose Lanes Alternate preliminary cost estimate is approximately $558.5M while the Managed Lanes Alternate preliminary cost estimate is approximately $824.6M. These preliminary costs do not include right-of-way or mitigation costs. ROW and mitigation costs will be determined at a later stage, however, it is not anticipated that the overall cost for ROW and mitigation will significantly impact the cost of the alternates.

If pricing strategies would be implemented under the Managed Lanes Alternate, the revenues would help offset the cost to construct and monitor the facility.

H. Summary

Generally, the No-Build Alternate would not meet the projects purpose and need, would result in increasing congestion and noise levels and require a $96.9M investment in major maintenance activities.

Generally, the General Purpose Lanes Alternate would meet the purpose and need, would have less direct impacts on environmental resources, and would require an investment of $558.5M.

Generally, the Managed Lanes Alternate would meet the purpose and need, would potentially result in lesser cumulative impacts on environmental resources, and require an investment of $824.6M. In comparison, to the General Purpose Lanes Alternate, the Managed Lanes Alternate may result in a lower rate of residential development outside of the Priority Funding Area, and a greater safety, enforcement, and incident management benefits.

I. Federal Actions

Each of the Build alternatives would require approval of both FHWA and the USACE. FHWA approval would be required for modifications to existing Interstate access points. FHWA approval also would be needed to authorize implementation of tolls as part of a managed lane option. USACE approval would be required for a permit for impacts to waters of the United States under Section 404 of the Clean Water Act."

I. PURPOSE AND NEED

A. Identification in the Master Plan

I-95 in Maryland extends 110 miles from the Woodrow Wilson Bridge at the Virginia State line to the Delaware State line. It provides continuity for regional traffic from Florida to Maine and operates as an important backbone for commuter traffic within Maryland. As the "East Coast's Main Street," I-95 serves high volumes of regional commercial/business and recreational traffic. The Maryland Transportation Authority (hereinafter referred to as the Authority) owns, operates, and maintains a 50-mile portion of I-95 in Maryland, beginning north of Baltimore City and extending to the Delaware State line, known as the John F. Kennedy Memorial Highway (JFK).

The Authority, in cooperation with the Federal Highway Administration (FHWA) and the Maryland Department of Transportation (MDOT), developed the *I-95 Master Plan, I-895 Split(N) to the Delaware State Line* (hereinafter referred to as the I-95 Master Plan) study approach to comprehensively identify long-range transportation needs that establish clear goals for system maintenance, preservation and enhancement, and ensure the development of environmentally sensitive and intermodal-friendly solutions for the JFK.

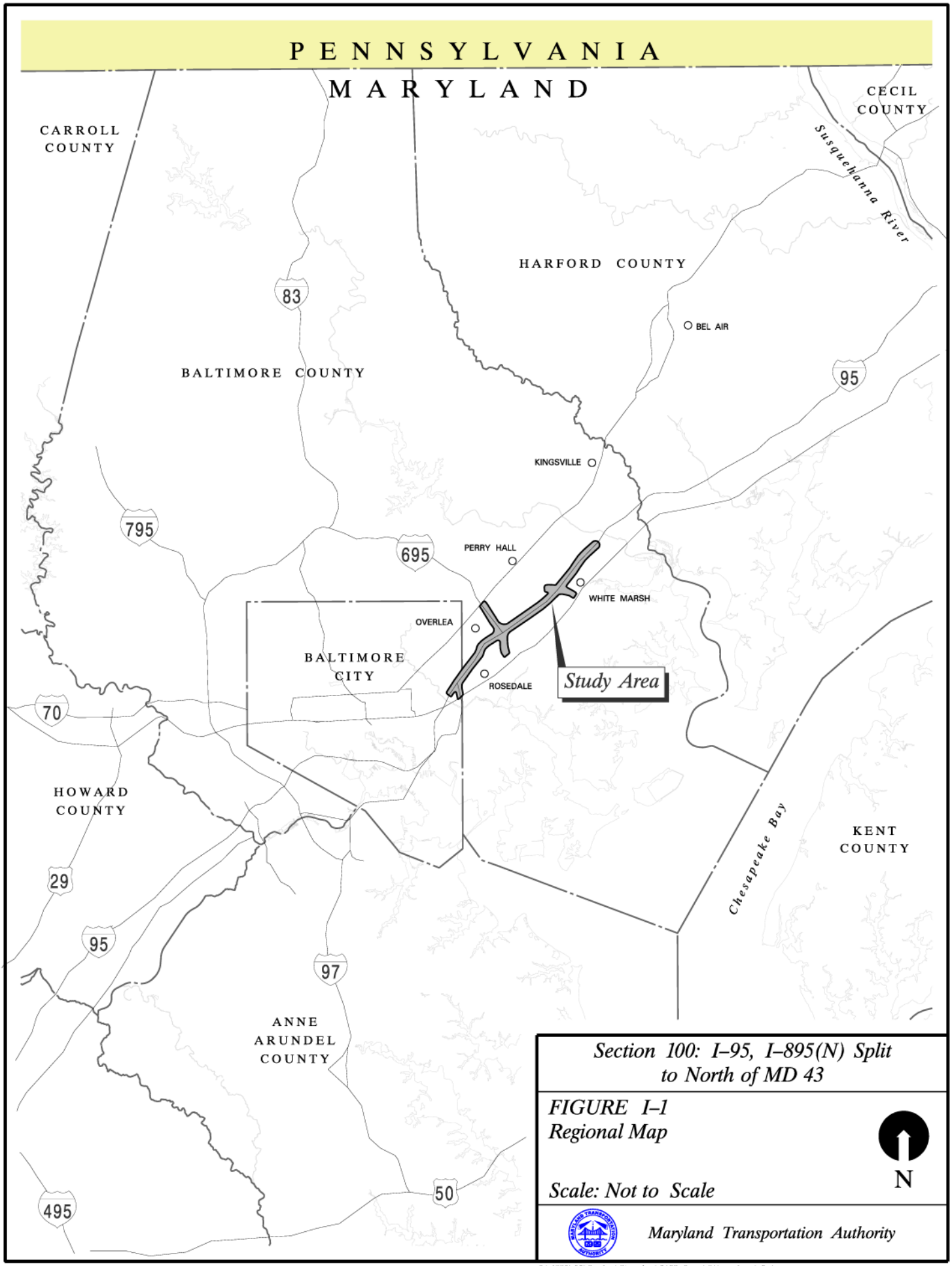
The Authority adopted the I-95 Master Plan in April 2003. It identified four independent projects including:

Section 100: I-95, I-895 (N) Split to North of MD 43
Section 200: North of MD 43 to North of MD 22
Section 300: North of MD 22 to North of MD 222
Section 400: North of MD 222 to the Delaware State Line

Throughout the I-95 Master Plan process, the Authority coordinated with local, State, and Federal regulatory and resource agencies. This coordination resulted in agency concurrence on the need for four independent projects and their termini and the concepts to be carried forward for each. Concurring agencies included the FHWA, EPA, USACE, NMFS, MDE, and DNR. Section 100 is the first independent project identified in the I-95 Master Plan to be initiated.

B. Project Location

The study area for Section 100: I-95, I-895(N) Split to North of MD 43 (hereinafter referred to as Section 100), is approximately nine miles long, extending north along I-95 from just south of the I-895(N) split on the northeast side of Baltimore City, to the New Forge Road overpass in Baltimore County, just north of the MD 43 Interchange. The study area includes the I-895(N), I-695, and MD 43 Interchanges, as well as the mainline of I-95 in this area, and extends approximately 0.25 mile out from the edge of the existing right-of-way (***Figures I-1 and I-2***).


PENNSYLVANIA
MARYLAND
CARROLL COUNTY
CECIL COUNTY
Susquehanna River
HARFORD COUNTY
83
BEL AIR
BALTIMORE COUNTY
95
KINGSVILLE
795
695
PERRY HALL
WHITE MARSH
OVERLEA
BALTIMORE CITY
ROSEDALE
Study Area
70
HOWARD COUNTY
Chesapeake Bay
KENT COUNTY
29
95
97
ANNE ARUNDEL COUNTY
50
495
Section 100: I–95, I–895(N) Split to North of MD 43
FIGURE I–1
Regional Map
Scale: Not to Scale
N
Maryland Transportation Authority
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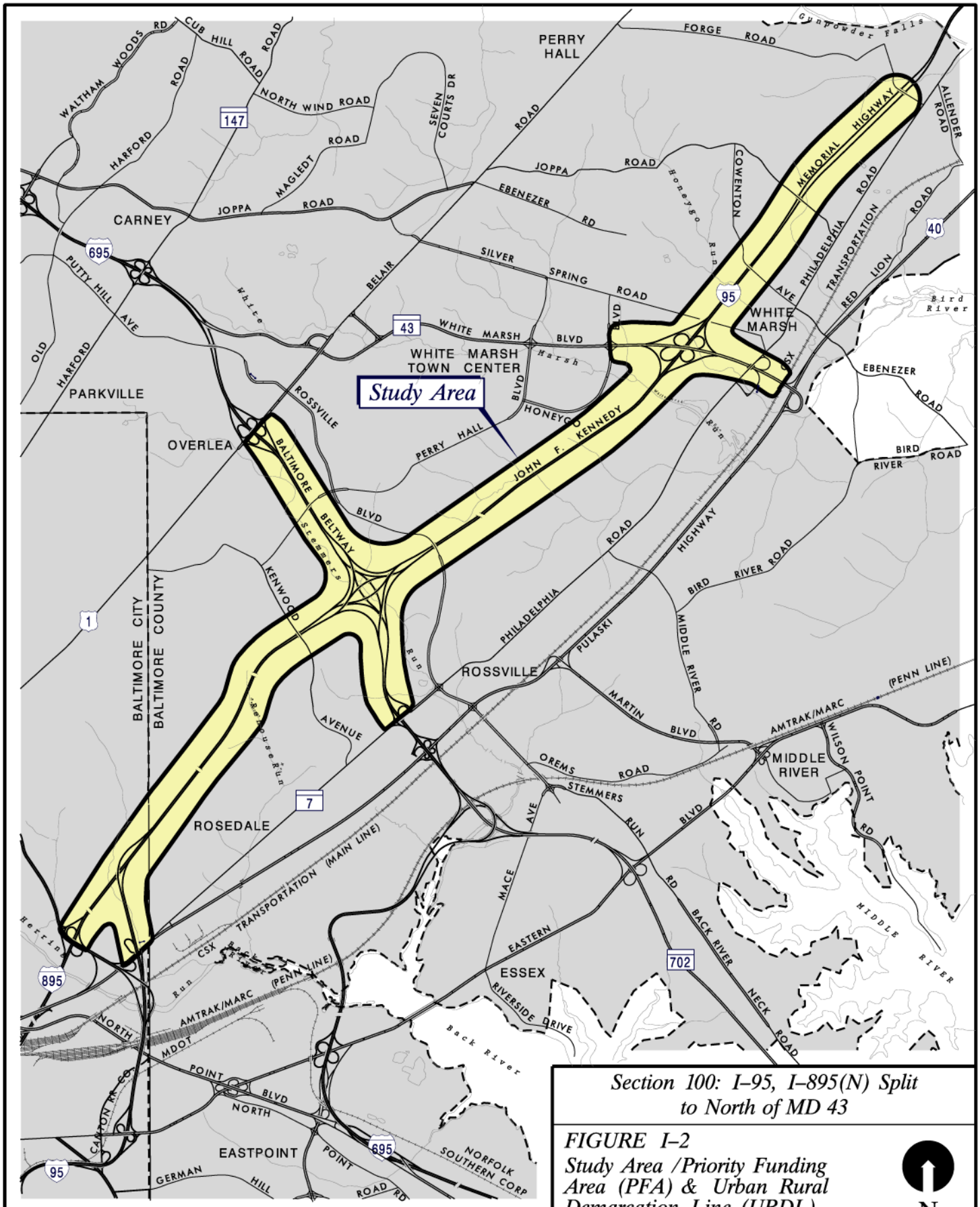

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE I–2
Study Area /Priority Funding Area (PFA) & Urban Rural Demarcation Line (URDL)

Maryland Transportation Authority

Source: Baltimore County GIS Services Unit

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The Section 100 study area is situated just north of Baltimore City's industrial and commercial areas. The northern boundary of the study area coincides with the Baltimore County Urban Rural Demarcation Line (URDL) and the Priority Funding Area (PFA) boundary (***Figure I-2***). The urban area, south of the URDL (and within the PFA boundary), is the focus for planned new and infill development activity. Further discussion of the URDL and PFA is provided in Section III-C of the Environmental Assessment (EA).

C. Project Description

This study will examine safety and service improvements to reduce congestion on I-95 from just south of the I-895(N) split to just north of the MD 43 Interchange by improving access, mobility, and safety, while helping to concentrate growth within the PFA. This study will also examine opportunities to increase safety at the I-895, I-695, and MD 43 Interchanges, as well as along the I-95 mainline.

Section 100 is the most congested section of I-95 in Maryland north of Baltimore City; currently operating at Level of Service (LOS) F during the morning and evening peak hours. (See Chapter I-H for a definition of LOS.) If capacity needs are not addressed, congestion is expected to increase by the design year of 2025, resulting in LOS E and F even during weekend peak periods. In addition, accidents in the study area have been steadily increasing, and are anticipated to further increase by 2025 due to the volume of diverging, merging, and weaving movements at the existing interchanges.

D. Purpose of the Project

The purpose of the proposed action is to address capacity and safety needs on Section 100 and thereby improve access, mobility, and safety for local, regional, and inter-regional traffic, including passenger, freight, and transit vehicles.

E. Need For the Project

The proposed action is intended to address the following capacity and safety needs on Section 100:

1. Capacity

Section 100 is the most congested section of I-95 in Maryland north of Baltimore City. Currently, Section 100, south of MD 43, operates at LOS F during the morning and evening rush hours. If capacity needs are not addressed, congestion is expected to increase by the planning horizon year of 2025. By 2025, Section 100, south of MD 43, is also expected to operate at LOS E and F during weekend peak periods. Unchecked, increased congestion levels will extend the existing peak hour into a peak period of

several hours in duration and increase the level of diversion to alternate routes, such as the community-oriented arterials US 1, US 40, and MD 7.

2. Safety

The accident rate on Section 100 currently is lower than the statewide average for comparable urban interstates within Maryland. However, the total number of accidents on Section 100 is increasing, especially in the vicinity of the urban I-895, I-695, and MD 43 Interchanges, where large volumes of merging, diverging, and weaving movements occur.

At some locations, left-hand exit and entrance treatments, limited auxiliary lane lengths, and restricted sight distances may increase the potential for accidents to occur. The majority of the reported accidents in Section 100 are of the types normally identified as congestion-related, such as rear-end and sideswipe. If the anticipated congestion levels in Section 100 are not addressed, an increase in the number and severity of congestion-related accidents would likely occur.

F. Background

I-95 is the backbone of the East Coast's highway infrastructure, serving Florida to Maine regional traffic, while at the same time serving as an arterial for local commuter traffic within each state. Within Maryland, I-95 provides access to two passenger rail systems (Maryland Rail Commuter (MARC) commuter rail and Amtrak), three freight railroad systems (Amtrak, CSX, and Norfolk-Southern), two airports (Baltimore/Washington International Airport (BWI) and Martin State Airport), and the Port of Baltimore. The proximity of I-95 to numerous intermodal terminals and urban centers ensures a growing travel demand generated by both local economic development and the transportation needs of the one-quarter of the United State's population that resides on the East Coast.

The portion of I-95, from the I-895(N) split to MD 43, was opened to traffic in 1963. Upon opening, I-95 consisted of three lanes in each direction between I-895 and MD 43. There were two lanes in each direction when the section of I-95 north of MD 43 opened in 1963. The interchange at I-695 and a partial interchange at MD 43 were constructed under independent contracts during the same time frame. In 1972, a third lane was added to each direction of I-95 from MD 43 to the north and the I-95/I-895 Interchange was constructed. In the mid-seventies, the remaining ramps at the MD 43 Interchange were completed. On January 30, 1991, ownership of the section of I-95 from I-895 to MD 43, was transferred from the Maryland State Highway Administration (SHA) to the Authority by an inter-agency agreement. In Spring 1993, the portion of I-95 from I-695 to MD 43 was widened to four lanes in each direction. The fourth lane was extended north of MD 43 in Spring 1994.

G. Land Use/Economic Development

I-95 is a major transportation facility that influences inter- and intra-regional road transportation within Baltimore County and Baltimore City. I-95 also provides access to local and regional inter-modal terminals, including the Port of Baltimore.

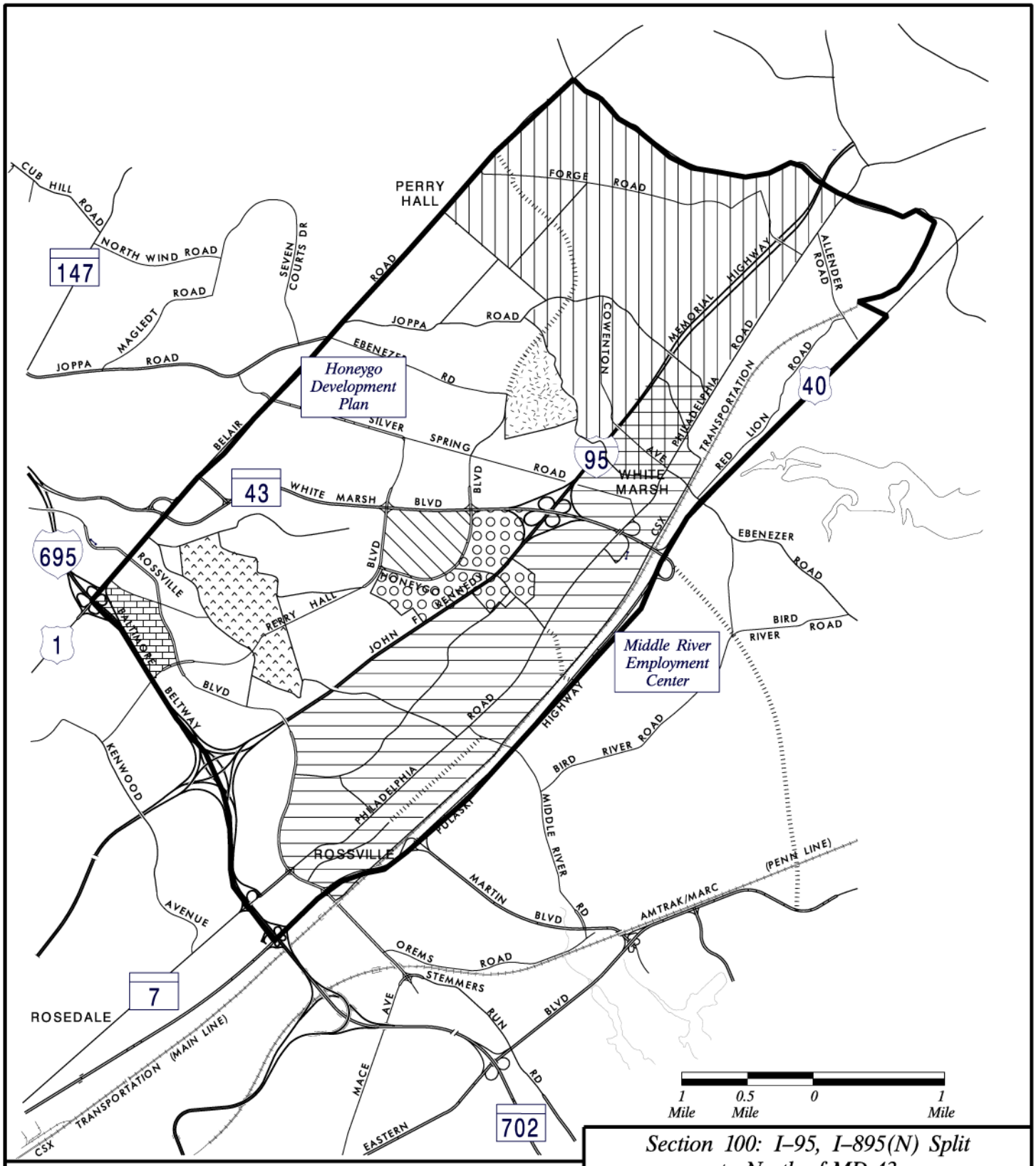
State and County land development policies and plans will strongly influence the pace and location of growth along I-95 in Maryland. Maryland's Smart Growth Priority Funding Areas (PFA) Act of 1997 (Smart Growth Act) directs State infrastructure funds to areas within or connecting county-designated and state-certified PFAs. In addition, Executive Order (EO) 01.01.2003.33, *Maryland's Priority Places Strategy*, directs agencies to implement PFAs and planned growth in order to "develop long-term solutions to the complicated issues of economic growth, community revitalization, and resource conservation to achieve the best "public return" on State investments." The study area is located within a PFA, as previously depicted on ***Figure I-2***, thereby indicating that the proposed infrastructure will be consistent with both the Smart Growth Act and the Maryland's Priority Places Strategy.

Land use immediately south of the study area, within Baltimore City, is primarily industrial with some interspersed residential use. The I-95/I-895(N) split occurs just south of the Baltimore City/Baltimore County line. Within Baltimore City, I-95 and I-895 serve the Canton Industrial Area, the Port of Baltimore, and the Fort Holabird Industrial Park, before continuing south through the Fort McHenry Tunnel and the Baltimore Harbor Tunnel, respectively.

Baltimore County has a 30-year history of considering growth management in its general plan. A key component of its growth control efforts is the designation of urban and rural zones, denoted by the URDL. Within the urban section (where 90 percent of the County population resides), emphasis is placed upon economic development, public safety, education, and community conservation.

The study area falls completely within the urban area of Baltimore County, south of the URDL (***Figure I-2***). The land-management areas within the urban section include community conservation areas (CCAs), growth areas, employment areas, and the Towson Urban Center. CCAs within the URDL, near I-95, contain established residential communities and industrial/commercial developments.

The White Marsh Business Community, adjacent to the MD 43 Interchange, includes dense commercial, business, residential, and institutional uses on both the east and west sides of I-95. Other major private developments that are planned near the study area include the Middle River Employment Center (MREC), the Honeygo development, and developments within the Perry Hall – White Marsh Growth Area (***Figure I-3***).



Legend

- *Road Network*
- *Proposed Road Project*
- *Perry Hall/White Marsh Growth Area*
- *Fitch Ave. Industrial Area*
- *Honeygo Park*
- *Fullerton Reservoir Site*
- *White Marsh Town Center*
- *Philadelphia Road Corridor*
- *White Marsh Business Community*
- *Honeygo*

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

FIGURE I–3
Future Land Use/Economic Development Areas

N

Maryland Transportation Authority

Data Sources:
URDL, Land Management Areas:
Baltimore County Office of Planning (1:24000)
Roads: Baltimore Metropolitan Council (1:24000)

Data Sources:
Baltimore County Office of Planning
OIT – GIS Services Unit

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The planned MREC site is located southeast of the I-95/MD 43 Interchange. The MREC which includes a 1,000 acre undeveloped parcel, Martin State Airport, and the Chesapeake Industrial Park, is expected to attract approximately 10,000 to 15,000 new jobs to the region, including Lockheed Martin Aerostructures/General Electric facilities. The MREC site is currently served by Amtrak, and would also be accessible from the MD 43 Extended roadway, which is currently under construction. The Perry Hall – White Marsh Growth Area has been established to help promote further growth in the study area. The center of the Growth Area is located at the White Marsh Mall. Three primary sections within the Growth Area are designated for business development, including the White Marsh Business Community, the Philadelphia Road Corridor, and the Fitch Avenue Industrial Area.

Northwest of the I-95/MD 43 Interchange is the Honeygo development plan, a consortium of multiple private-development projects in the White Marsh area. Development projections for the Honeygo area call for 3,500 to 5,600 residential units, with buildout expected to occur by 2025 (some of the units are already in place). Also in the study area is the Baltimore Air Park, which is being redeveloped with residential land use.

H. Traffic Data and Level of Service

Travel demand forecasts were developed using the Baltimore Regional Transportation Board (BRTB) approved travel demand model (Round 6). Model inputs included socio-economic, roadway network, and transit network data. Socio-economic data, such as projected changes in population, households, and employment, were taken from regional forecasts developed by the metropolitan planning organization with the assistance of local jurisdictions.

The roadway network in the model is in accordance with the 2001 Baltimore Regional Transportation Plan. The model assumed Section 100 to include six general purpose lanes as a baseline. Some assumed improvements include the widening of I-695 from six to eight lanes between I-95 and I-83 and the extension of MD 43 to MD 150 as a four-lane roadway.

The transit network, as approved by the BRTB, includes express bus service from Bel Air to White Marsh, Hunt Valley, Towson, and eastern Baltimore County along Maryland 43 Extended. Bus service was also assumed to operate from White Marsh to Harford County, with circulation bus service in the White Marsh area. Light rail from White Marsh to Baltimore City was also part of transit network assumptions used in the future year model.

The highest weekday AM peak hour volume along Section 100 occurs between the I-895(N) and I-695 Interchanges, while the highest weekday PM peak hour volume occurs between the I-695 and MD 43 Interchanges (***Table I-1***). Weekday peak hour volumes are currently at or near capacity. Weekday peak hour traffic volumes exceed weekend peak hour volumes by 1,650 to 3,000 vehicles per hour (27 to 54 percent). By 2025, Average Daily Traffic (ADT) volumes are expected to increase by as much as 37 percent. Weekday peak hour travel demand will continue to exceed weekend peak period demand, even though weekend peak period travel is projected to increase at a higher rate.

LOS is a measure of congestion experienced by drivers. LOS ranges from A to F, with LOS A indicating free flow, and LOS B and C describing varying degrees of operation at or near the posted speed limit. At LOS D, speeds decline slightly, while a LOS E describes operations approaching, or at capacity, with little room to maneuver in the traffic stream. Finally, LOS F describes breakdowns in vehicular flow, with stop-and-go conditions.

The highest levels of congestion in the AM peak hour occur along southbound I-95, whereas the highest congestion levels in the PM peak hour occur along northbound I-95 (***Table I-2***). By 2025, congestion is expected to spread further north in both the AM and PM peak directions, with both peak periods operating at LOS F.

North of I-895, weekend peak period traffic currently operates at Level of Service (LOS) D or better. Without improvements, the predicted LOS for 2025 weekend peak period traffic throughout the study area would be an undesirable LOS E, with the exception of northbound I-95 between I-695 and north of MD 43, which is predicted to be LOS F, as shown in ***Table I-2***.

I. Accident Data/Safety Conditions

The Maryland State Highway Administration, Office of Traffic and Safety (SHA-OOTS) provided police-reported accident data for the 8.7-mile study area for the three-year period from 2000 through 2002. During that period, a total of 789 accidents were reported in the study area, including six fatal accidents, 288 injury accidents, and 495 property-damage-only accidents. The total number of accidents increased 46.5 percent during the three-year period, from 211 in 2000 to 309 in 2002.

The percentage of heavy vehicles on Section 100 is approximately 10 to 15 percent of the overall traffic volume, whereas the Maryland statewide average heavy vehicle percentage for urban interstates is six to ten percent. Overall, 158 of the 789 reported accidents involved a heavy vehicle, which equated to 10.2 truck-related accidents per 100 million vehicle miles traveled (MVMT). This rate is two percent greater than the statewide average of 10.0 truck-related accidents per 100 MVMT for similar Maryland urban interstates.

Table I-1. Existing and Future No-Build Traffic Volumes

Limits	2002 Volume	2025 Volume [1]	Percent Growth	2002 Volume	2025 Volume [1]	Percent Growth
	Average Daily Traffic (Vehicles/Day)			Weekend [2] (Vehicles/Hour)		
South of I-895(N)	101,000	138,000	37%	3,900	5,550	42%
I-895(N) – I-695	161,000	219,000	36%	5,800	8,100	40%
I-695 – MD 43	166,000	225,000	35%	6,650	9,075	37%
North of MD 43	161,000	221,000	37%	6,150	8,475	38%
	AM Peak [3] (Vehicles/Hour)			PM Peak [3] (Vehicles/Hour)		
South of I-895(N)	5,200	6,350	22%	5,075	5,825	15%
I-895(N) – I-695	8,550	10,200	19%	8,575	9,725	13%
I-695 – MD 43	7,850	9,600	22%	8,650	9,850	14%
North of MD 43	7,700	9,575	24%	7,950	9,300	17%

Source: Year 2002 volumes from various Maryland State Highway Administration/Maryland Transportation Authority traffic counts. Year 2025 volumes developed from the Baltimore Metropolitan Council Regional Travel Demand Model, Round 6.

[1] The 2025 volumes assume improvements to MD 43, I-695, and expanded transit service as shown in the constrained long range plan.
[2] Weekend peak period volumes represent approximately the 50th highest weekend hour that occurs in a calendar year.
[3] AM and PM peak hour volumes represent the highest hourly volumes in the peak direction that occur on an average weekday (Monday through Friday).

Table I-2. Existing and Future No-Build Levels of Service (LOS) [1]

Limits	I-895 to I-695		I-695 to MD 43		North of MD 43	
	2002	2025 [2]	2002	2025 [2]	2002	2025 [2]
Northbound						
AM Peak [3]	LOS A-C	LOS D	LOS A-C	LOS D	LOS A-C	LOS D
PM Peak [3]	LOS F	LOS F	LOS F	LOS F	LOS E	LOS F
Weekend [4]	LOS A-C	LOS E	LOS D	LOS F	LOS A-C	LOS F
Southbound						
AM Peak [3]	LOS F	LOS F	LOS E	LOS F	LOS E	LOS F
PM Peak [3]	LOS A-C	LOS D	LOS A-C	LOS E	LOS A-C	LOS D
Weekend [4]	LOS A-C	LOS E	LOS D	LOS E	LOS A-C	LOS E

Source: Year 2002 volumes from various Maryland State Highway Administration/Maryland Transportation Authority traffic counts. Year 2025 volumes developed from the Baltimore Metropolitan Council Regional Travel Demand Model, Round 6.

[1] LOS A-C describes varying degrees of operation at or above posted speed limits. At LOS D, speeds decline slightly. LOS E describes operations at capacity, with little room to maneuver in the traffic stream. LOS F describes breakdowns in vehicular flow (Source: *2000 Highway Capacity Manual*).
[2] The 2025 volumes assume improvements to MD 43, I-695, and expanded transit service as shown in the constrained long range plan.
[3] AM and PM peak hour volumes represent the highest hourly volumes in the peak direction that occur on an average weekday (Monday through Friday).
[4] Weekend peak period volumes represent approximately the 50th highest weekend hour that occurs in a calendar year.

Table I-3 summarizes reported accidents within the study area by accident type and location. More than 65 percent of the reported accidents in Section 100 are of the types normally identified as congestion-related, such as rear end or sideswipe. The calculated study area accident rate shown in ***Table I-3*** of 50.8 accidents per 100 MVMT was 8.3 percent below the average rate of 55.4 accidents per 100 MVMT for similar Maryland maintained interstates. (Study area rates were found by dividing the specific number of accidents by the 100 MVMT provided by SHA-OOTS.)

Table I-3. Accident Data Summary (2000-2002)

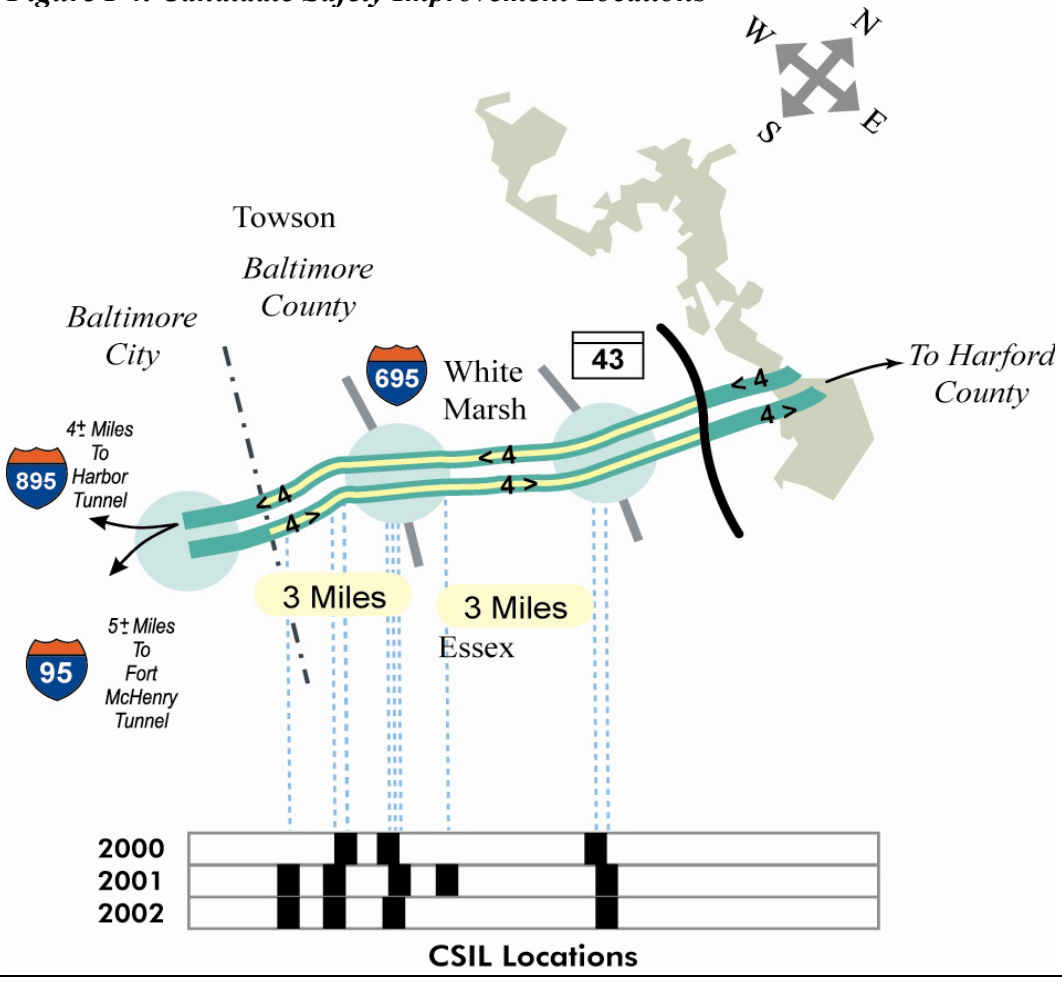
		Mainline Sections				Interchanges		Totals	Study Rate [1]	State-wide Rate [2]
		I-895(N) to I-695	I-695 to MD 43	North of MD 43	Sub-total	I-695	MD 43			
Mileage		**2.36**	**2.55**	**2.43**	**7.34**	**0.75**	**0.63**	**8.72**		
Accident Type	**Rear End**	140	71	52	263	55	33	351	22.6	21.7
	Fixed Object	47	42	28	117	27	29	173	11.1	14.8
	Sideswipe	28	31	10	69	22	13	104	6.7	7.2
	Parked	17	3	1	21	2	0	23	1.5	1.3
	Pedestrian	0	0	1	1	0	0	2	0.1	0.2
	Opposite Direction	0	0	1	1	0	1	2	0.1	0.3
	Other	35	36	27	98	21	16	134	8.6	4.7
Total		**267**	**183**	**120**	**570**	**127**	**92**	**789**	**50.8**	**55.4**
Severity	**Fatal**	2	0	2	4	0	1	6	0.4	0.4
	Injury	98	75	42	215	45	30	288	18.5	22.4
	Property Damage Only	167	108	76	351	82	61	495	31.9	32.6
Condition	**Nighttime**	81	56	30	167	39	31	233	30%	32%
	Wet Surface	37	51	21	109	28	21	144	18%	28%
	Alcohol	20	11	10	41	2	8	51	7%	8%

[1] Study rates are in 100 million vehicle miles traveled (MVMT) and are calculated by dividing the number of accidents by vehicle miles traveled provided by SHA-OOTS.
[2] Statewide rates are in 100 MVMT and are average rates for similar Maryland maintained interstates.

Most of the study area accident rates shown in ***Table I-3*** were comparable to their respective statewide average rates, with the exception of accidents categorized as "other." These accidents include those not directly applicable to other categories (such as u-turn accidents, backing accidents, or animal-related accidents) and accident types not indicated on accident reports. Based on the information available, it is not immediately clear why the rate of "other" accidents shown for the study area (8.6 accidents per 100

MVMT) was 83 percent greater than the statewide average rate of 4.7 accidents per 100 MVMT.

Figure I-4. Candidate Safety Improvement Locations



From 1999 through 2002, 17 sections of I-95 throughout the study area were identified as secondary Candidate Safety Improvement Locations (CSILs). CSILs are one-half mile long segments of roadway that have ten or more accidents. They are classified as priority or secondary depending on how much greater the segment's accident rate is compared to other Maryland highways with similar design characteristics. As shown in ***Figure I-4***, the 17 sections were concentrated primarily within the I-695 and MD 43 Interchanges. The CSILs are likely concentrated in the interchange areas because of the merging, diverging, and weaving movements that occur there. At some locations, left-hand exit and entrance treatments, limited auxiliary lane lengths, and restricted sight distances may increase the potential for accidents to occur. These factors, in combination with the overall congestion in Section 100, contribute to the CSILs.

J. Conclusion

The Section 100 Project focuses on safety and service improvements to reduce congestion on I-95 from the I-895(N) split to just north of the MD 43 Interchange. Improvements examined include efforts to improve access, mobility, and safety, while helping to concentrate growth within the PFA. This includes efforts to increase safety at the I-895, I-695, and MD 43 Interchanges, as well as the I-95 mainline within the study area.

II. ALTERNATES CONSIDERED

A. I-95 Master Plan Concepts

As previously discussed in Chapter I: *Purpose and Need*, the I-95 Master Plan (which was adopted by the Authority in April 2003 and concurred upon by the resource agencies) identified the need for four independent projects and their termini along the John F. Kennedy Memorial Highway (JFK). The I-95 Master Plan also considered six conceptual highway alternates for each of the four independent projects (including the Section 100 Project), and recommended which should be carried forward. The six concepts considered represented a broad range of potential highway improvements. The following provides a description of each of the six conceptual alternates.

1. Concept C-1: No-Build

The No-Build Concept would retain the existing I-95 highway and associated interchanges in their present configurations, and allow for routine maintenance and safety upgrades. Existing I-95 would remain four lanes per direction from the I-895(N) split to just north of MD 43. Although this concept would not meet the needs of the project, it was recommended for further evaluation as a baseline for comparing other alternates.

2. Concept C-2: All Lanes Tolled

The All Lanes Tolled Concept would require tolls on all existing and any additional travel lanes. This concept would assume six lanes per direction between the I-895(N) split and I-695 (i.e., the addition of two new lanes), and four lanes per direction from I-695 to just north of MD 43 (i.e., no lanes added). In addition, this concept would include the addition of auxiliary collector-distributor (C-D) lanes where needed to improve traffic operations and safety.

The tolling of all lanes would be expected to increase peak hour traffic volumes on parallel routes (primarily US 40, US 1, and MD 7) by 25 to 70 percent, causing operational failures along the entire highway network. Improvements to the parallel routes could increase environmental and community impacts related to transportation needs. Based on this assessment, the All Lanes Tolled Concept was not considered reasonable, and was therefore dismissed from further consideration.

3. Concept C-3: High Occupancy Vehicle (HOV) Lanes

This concept would include a total of six lanes per direction between the I-895(N) split and the I-695 Interchange, all of which would be general purpose lanes (i.e., the addition of two new general purpose lanes). Between I-695 and MD 43, this concept would propose to add one HOV lane per direction, resulting in a total of five lanes per direction, four of which would be general purpose lanes, and one of which would be an HOV lane.

HOV lanes would be expected to create an incentive for carpooling. Traffic analyses indicated that during the weekday, the peak hour/peak direction traffic in the general purpose lanes would operate at or above capacity (Level of Service (LOS) E and LOS F), while the HOV lane would operate between LOS B and LOS C. While the HOV lanes may encourage carpooling, their location adjacent to the median would require motorists to cross three or more general purpose lanes to access the HOV lane. In conclusion, traffic analysis indicated that LOS F is anticipated during the weekday on sections of the general purpose lanes and no dramatic relief would be provided by the single HOV lane. Based on this assessment, the HOV Lanes Concept was considered unable to meet the project need of improving congestion, and was therefore dismissed from further consideration.

4. Concept C-4: Reversible Lanes

This concept would include the addition of a two-lane separated and reversible roadway in the median through the entire study area. This concept would result in a total of ten lanes - four general purpose lanes in each direction, and two reversible lanes located between the northbound and southbound lanes, separated from the general purpose lanes by median barriers. The reversible roadways could be operated as managed lanes (HOV, tolled expressway, or other) in the peak direction during weekday and weekend peak periods.

During the weekday, the peak hour/peak direction traffic in the general purpose lanes would operate at or above capacity (between LOS E and LOS F), while the reversible lanes would operate between LOS A and LOS B. During the weekend, the study area roadway would operate at or above capacity (between LOS E and LOS F) in the direction in which the reversible roadway is not in operation.

It is anticipated that the Reversible Lanes Concept would work well during weekday peak periods (traffic flow is 65 percent in the peak direction); however, serious operational and maintenance concerns would arise when peak directions of flow were not established (50 percent north/50 percent south). Reversing traffic flow direction could take up to one hour for each four-mile section of roadway, and would reduce roadway capacity during flow reversal.

Since the peak traffic volumes during holidays and weekends are evenly distributed between directions, this concept would not offer the necessary flexibility for successful traffic management of regional traffic flows. In addition, extensive geometric modifications would be essential at connecting interchanges, and bridge replacement would be required, incurring substantial costs due to restricted placement opportunities for structural piers.

Based on this assessment, the Reversible Lanes Concept was found to be unable to meet the project need of reducing congestion, and was considered to be unreasonable due to extensive geometric modifications, costs, and time constraints required to both construct and operate the facility. This concept was therefore dismissed from further consideration.

5. Concept C-5: Managed Roadways

The Managed Roadways Concept would include the addition of two managed lanes per direction from I-895 to the I-695 Interchange, which would be separated from the general purpose lanes and one another by barriers. From I-695 to the MD 43 Interchange, a C-D roadway, consisting of two lanes, would be added. This would alter the roadway configuration to include two C-D lanes, three general purpose lanes, and two managed lanes per direction. Each type of roadway (i.e., general purpose, C-D, and managed) would be separated from one another by barriers, with an additional barrier serving as the median between the northbound and southbound roadways (i.e. a total of six additional lanes, four being managed lanes and two being C-D lanes).

The managed lanes could operate under a single management strategy 24-hours per day, or on a "time-share basis" with different restrictions at different times of day. Management strategies could include restrictions at access locations (ramps), by time of day (peak/off-peak), by vehicle type (trucks/buses), by type of use (commercial or occupancy-HOV), by price (tolling), or by direction (reversible). Managed lanes would be designed for flexibility so that management strategies could be modified over time to maximize person-moving capacity, optimize vehicle carrying capacity, and achieve transportation and community goals.

During the weekday, the peak hour/peak direction traffic in the general purpose lanes is projected to operate at or above capacity (between LOS E and LOS F), while capacity would be available in the managed lanes, which are projected to operate between LOS A and LOS B. During the weekend peak hour, the mainline general purpose lanes are projected to operate between LOS D and LOS E throughout the corridor. Modification of the management strategy to improve the traffic split between the general purpose and managed lanes is anticipated to provide a better LOS for all lanes. Based on this assessment, the Managed Roadways Concept was found to meet the project needs, and was considered reasonable. This concept was therefore recommended for further consideration and evaluation.

6. Concept C-6: General Purpose Lanes

This concept would include the addition of two new general purpose lanes in each direction (total of six lanes per direction) from the I-895(N) split to I-695, and the addition of one general purpose lane in each direction, plus two C-D lanes per direction (total of five general purpose lanes and two new C-D lanes per direction, separated by a barrier) from I-695 to just north of MD 43.

This concept would provide good overall traffic operations for both weekday and weekend peak periods. However, due to the number of accessible travel lanes provided, there is no readily available means to implement a travel demand management program and limited incentive for transit or carpooling. Based upon the traffic analysis, this concept was found to meet the needs of the project, and was therefore recommended for further consideration and evaluation.

In summary, the I-95 Master Plan process resulted in the recommendation of three concepts to be carried forward into preliminary engineering analysis – No-Build, General Purpose Lanes Concept, and Managed Roadways Concept. Federal and State agencies involved in the I-95 Master Plan process (including the United States Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE)) concurred in the decision to advance these concepts into preliminary engineering analysis, while eliminating the other concepts considered in the I-95 Master Plan process.

B. Development/Analysis of Preliminary Alternates

The I-95 Master Plan recommended three concepts for further study, including the No-Build, General Purpose Lanes, and Managed Roadways Concepts. The recommendation to carry these three concepts was concurred upon by the FHWA, EPA, USACE, NMF, MDE, and DNR during the development of the I-95 Master Plan. Additional agency concurrence was also provided at that time for the purpose and need for the I-95 improvements and the termini for all four independent projects.

Using the three concepts from the I-95 Master Plan that were recommended for further study, the project team developed preliminary engineering designs. The following is a description and analysis of the preliminary alternates. Additional details regarding these alternates can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Alternatives Retained for Detailed Study (ARDS) Report* (Authority, 2004) prepared for this project.

1. Preliminary General Purpose Lanes Alternate (Including C-D Lanes)

This preliminary alternate was developed based on the General Purpose Lanes Concept from the I-95 Master Plan, and would include the provision of additional general purpose lanes to accommodate the projected traffic demand (***Figure II-1***). In addition, a barrier-separated C-D roadway would be provided from the I-695 Interchange to north of the MD 43 Interchange. In order to reach a peak hour/peak direction LOS E through the design year, this alternate would require a general roadway width of approximately 286 feet, and consist of the following:

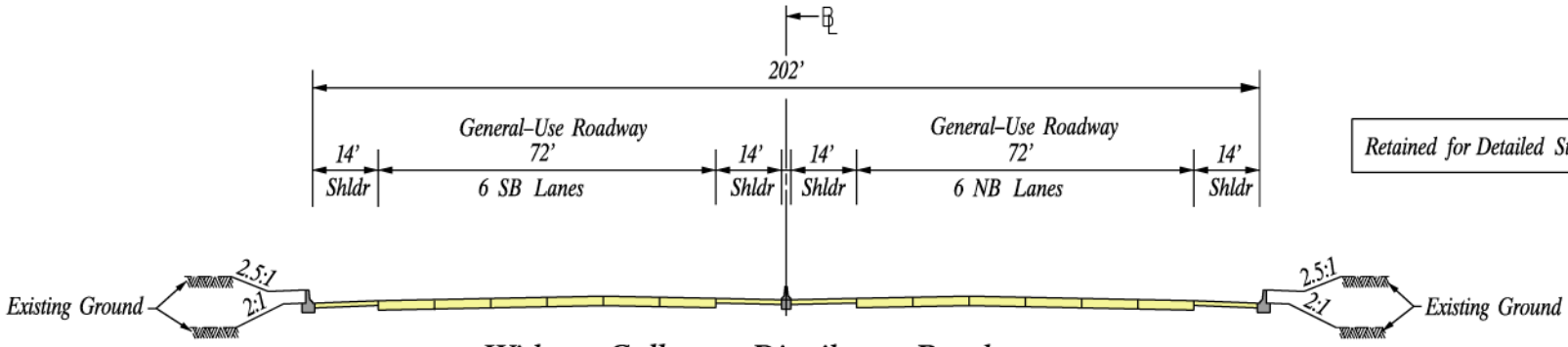
- Four lanes in each direction of I-95 from approximately ¼ mile south of the I-895 Interchange to the point where I-95 merges with I-895,
- Six lanes in each direction between the I-895(N) split and I-695,
- Four general purpose lanes and three C-D lanes per direction (separated by barriers) between I-695 and MD 43, and
- North of MD 43, the roadway would transition from four general purpose and three C-D lanes per direction to the existing four general purpose lanes per direction.

2. Preliminary Managed Lanes Alternate (Including C-D Lanes)

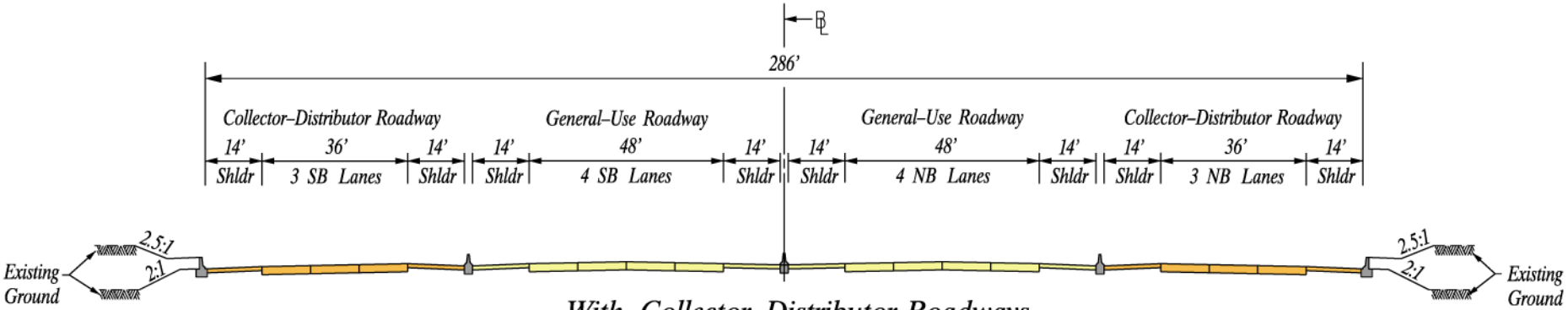
This preliminary alternate was developed based on the Managed Roadways Concept from the I-95 Master Plan, and would include two managed lanes per direction between I-895 and north of MD 43 (with associated shoulders and barriers), plus additional general purpose lanes as needed (***Figure II-2***). In addition, a barrier-separated C-D roadway would be provided from I-695 to north of MD 43. In order to reach a peak hour/peak direction LOS E or better through the design year, this alternate would require the following number of lanes per direction, with a general roadway width of approximately 370 feet:

- Four general purpose lanes in each direction of I-95 from approximately ¼ mile south of the I-895 Interchange to the point where I-95 merges with I-895,
- Two managed lanes and four general purpose lanes in each direction between the I-895(N) split and I-695,
- A two-lane managed roadway, a three-lane general purpose roadway, and a three-lane C-D roadway in each direction between I-695 and MD 43, and
- North of MD 43, the roadway would transition from the eight-lane section (two-lane managed, three-lane general purpose, and three-lane C-D) in each direction into the existing four lanes in each direction.

General Purpose Lanes



Without Collector–Distributor Roadways



With Collector–Distributor Roadways

Note: Alternates without C–D lanes were carried forward into detailed studies, while alternates with C–D lanes were eliminated.

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

FIGURE II–1
General Purpose Lanes Alternate Typical Sections

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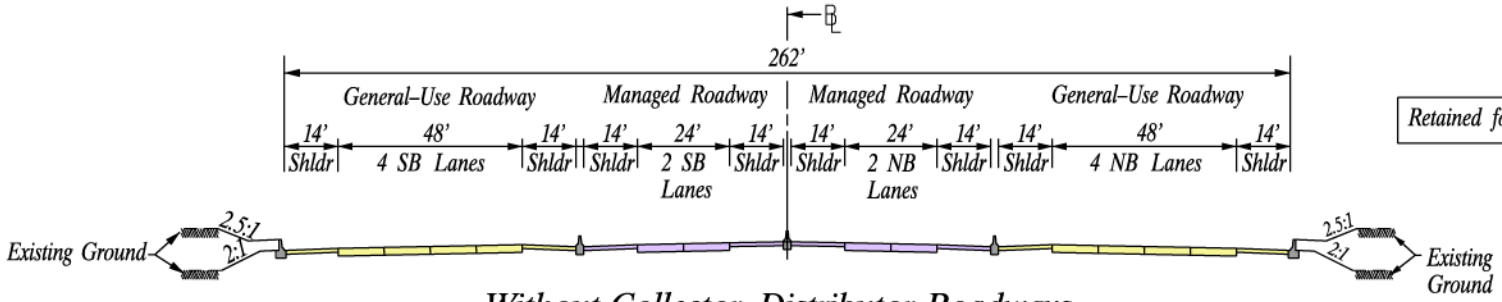
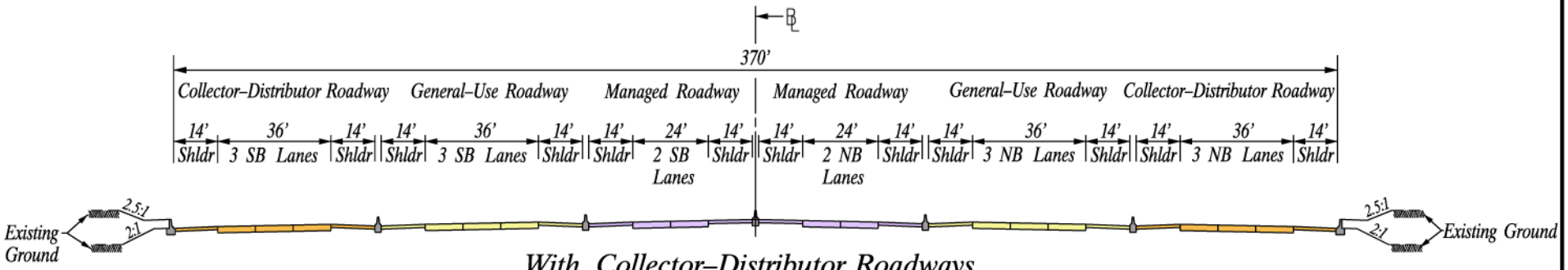
Managed Lanes



Without Collector–Distributor Roadways



With Collector–Distributor Roadways

Note: Alternates without C–D lanes were carried forward into detailed studies, while alternates with C–D lanes were eliminated.

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

FIGURE II–2
Managed Lanes Alternate Typical Sections

Maryland Transportation Authority

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3. Early Analysis of the Preliminary Alternates

Once the preliminary alternates were designed, the project team performed traffic and engineering analyses on each alternate. The original alternates included continuous barrier-separated C-D roadways from I-695 to north of MD 43 (as per the I-95 Master Plan Concepts). Analyses determined that the LOS criteria for the project could not be maintained through the MD 43/I-95 Interchange under this scenario, due to the high traffic volumes meant for the I-695 Interchange, which were being diverted through the MD 43 Interchange. In response, the project team examined the use of a local C-D roadway for only the MD 43 Interchange. However, the spacing between the I-695 and MD 43 Interchanges is insufficient to satisfactorily accommodate movements from the C-D lanes to the through lanes, and movements from the through lanes to the I-695 westbound deceleration lane. In addition, the incorporation of C-D lanes would require an expanded cross section, thereby requiring additional right-of-way, which would increase impacts to both the natural and man-made environment. Although the use of C-D lanes would reduce the number of conflict points, analyses indicate that they would not be necessary, and would not operate properly due to interchange spacing and/or traffic volumes.

Based upon this assessment, it was agreed that the C-D lanes should be removed from the General Purpose Lanes and Managed Lanes Alternate designs, as they would not improve the alternates' ability to meet the project needs, would not provide the originally intended function, and would increase impacts to the natural, cultural, and socio-economic environment. This agreement was reached with concurrence from the resource agencies, and in consultation with the Focus Group, as described in Chapter VI: *Coordination and Comments*.

C. Modifications to the Preliminary Alternates

The General Purpose Lanes Alternate and the Managed Lanes Alternate were modified based on the decision to eliminate C-D lanes from the preliminary designs.

1. General Purpose Lanes Alternate (Without C-D Lanes)

This alternate would include provisions of additional general purpose lanes to accommodate the projected traffic demand (***Figure II-1***). In order to reach a peak hour/peak direction LOS E through the design year, this alternate would consist of the following lane configurations, with a general roadway width of approximately 202 feet:

- Four lanes in each direction of I-95 from approximately ¼ mile south of the I-895 Interchange to the point where I-95 merges with I-895,
- Six lanes in each direction between the I-895(N) split and the MD 43 Interchange, and
- North of MD 43, the roadway would transition from six lanes in each direction to the existing four lanes in each direction.

2. Managed Lanes Alternate (Without C-D Lanes)

This alternate would include two managed lanes per direction between I-895 and north of MD 43 (with associated shoulders and barriers), plus additional general purpose lanes as needed (***Figure II-2***). In order to generally reach the peak hour/peak direction LOS E in the general purpose lanes and LOS D or better in the managed lanes through the design year, this alternate would require the following number of lanes per direction, with a general roadway width of approximately 262 feet:

- Four general purpose lanes in each direction of I-95 from approximately ¼ mile south of the I-895 Interchange to the point where I-95 merges with I-895,
- Two managed lanes and four general purpose lanes in each direction between the I-895(N) split and I-695,
- A two-lane managed roadway and a four-lane general purpose roadway in each direction between I-695 and MD 43, and
- North of MD 43, the roadway would transition from the six-lane section (two-lane managed and four-lane general purpose in each direction) into the existing four lanes in each direction.

The managed lanes could operate under a single management strategy 24-hours per day, or on a "time-share basis" with different restrictions at different times of day. Management strategies could include restrictions at access locations (ramps), by time of day (peak/off-peak), by vehicle-type (trucks/buses), by type of use (commercial/HOV), or by price (variable or fixed). Managed lanes would be designed for flexibility so that management strategies could be modified over time to maximize person-moving capacity, optimize vehicle carrying capacity, and achieve transportation and community goals.

D. Development/Analysis of Interchange Options

Originally, two interchange options were developed for each Build Alternate at each of the three interchange locations. These interchange options were based on the preliminary designs, which included C-D lanes. Details regarding these interchange designs can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 ARDS Report* prepared for this project. However, since C-D lanes were dismissed due to their inability to improve roadway capacity and safety conditions, and their increased man-made and environmental impacts, the interchange options were revised to accommodate the modified designs (without C-D lanes).

Using the modified alternate designs (without C-D lanes), two interchange options were developed for the General Purpose Lanes Alternate at each of the three existing interchange locations on I-95. For the Managed Lanes Alternate, two interchange options were developed for both the I-895 and MD 43 Interchanges, while three options were developed for the I-695 Interchange. The following is a summary of these interchange options. Details regarding these interchange designs can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 ARDS Report* prepared for this project.

1. General Purpose Lanes Alternate

a. I-95/I-895(N) Interchange

Option 2A: This interchange option would widen I-895 and I-95 on existing alignment, retaining I-895 as the through movement (***Figure II-3***).

Option 2B: This interchange option would adjust the configuration of the existing interchange by relocating the southbound roadway of I-95 and the northbound roadway of I-895 to make I-95 the through movement (***Figure II-4***).

b. I-95/I-695 Interchange

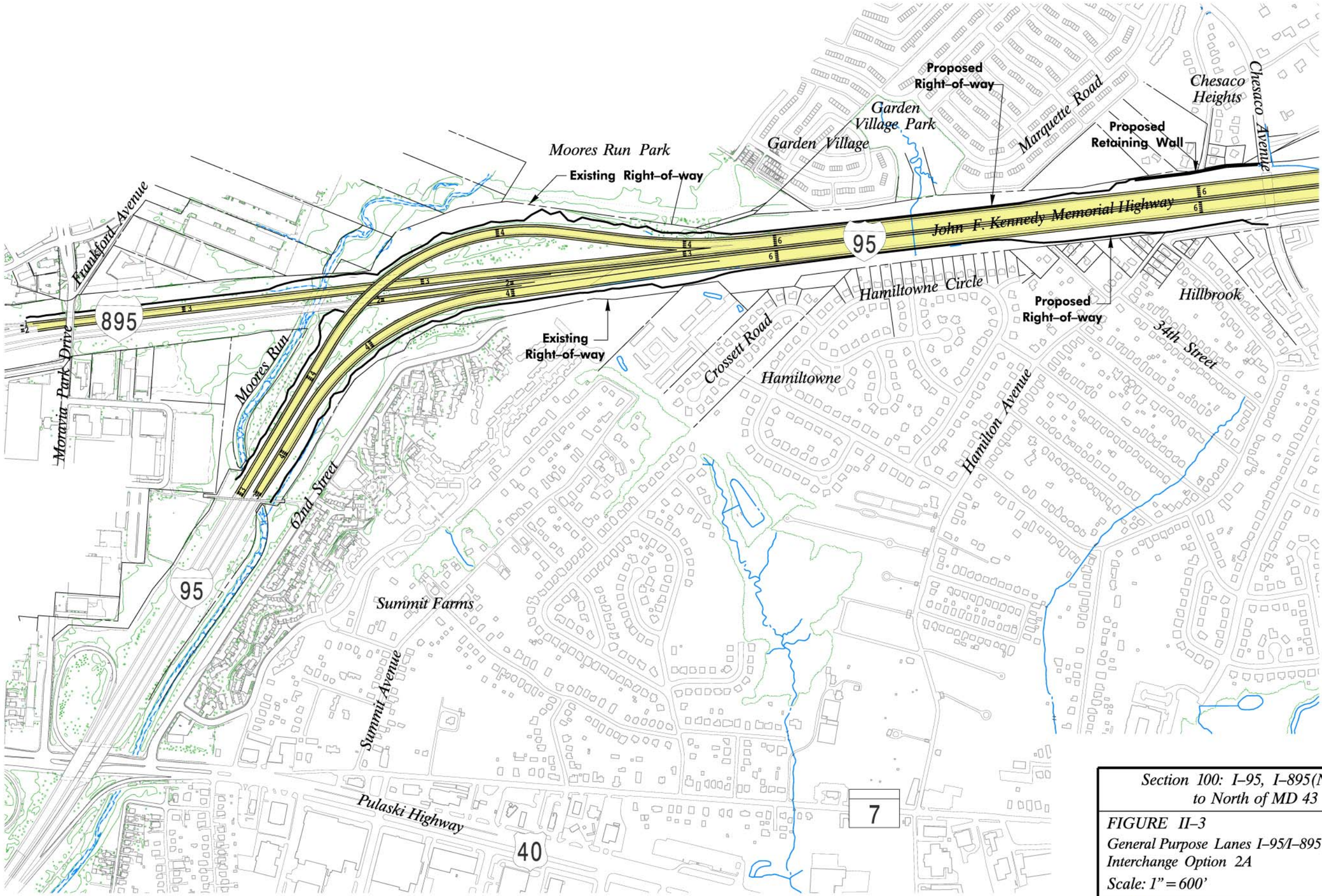
Option 2A: This interchange option would be a fully directional interchange, which would remove the braided mainline roadways on both I-95 and I-695, replacing them with mainline roadway alignments that would remain parallel. This would improve the interchange geometry and driver expectancy by replacing all left-hand entrances and exits with more conventional right-hand entrances and exits (***Figure II-5***). Driver expectancy describes situations that a driver would normally anticipate, such as exit ramps generally being located on the right side of the roadway.

Option 2B: This interchange option would maintain the braided mainline roadways on both I-95 and I-695. All left-hand exits and entrances would be retained. The movement from westbound I-695 to southbound I-95 would be replaced with a loop ramp (***Figure II-6***).

c. I-95/MD 43 Interchange

Option 2A: This interchange option would provide a single exit point on each approach with direct connections provided for all interchange movements. All weaving within the interchange would be eliminated (***Figure II-7***).

Option 2B: This option would provide a partial cloverleaf configuration, with two half-signals on MD 43 at the spur ramps. Weaving within the interchange would be minimized (***Figure II-8***).



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

FIGURE II–3
General Purpose Lanes I–95/I–895(N) Interchange Option 2A
Scale: 1" = 600'

N

Maryland Transportation Authority

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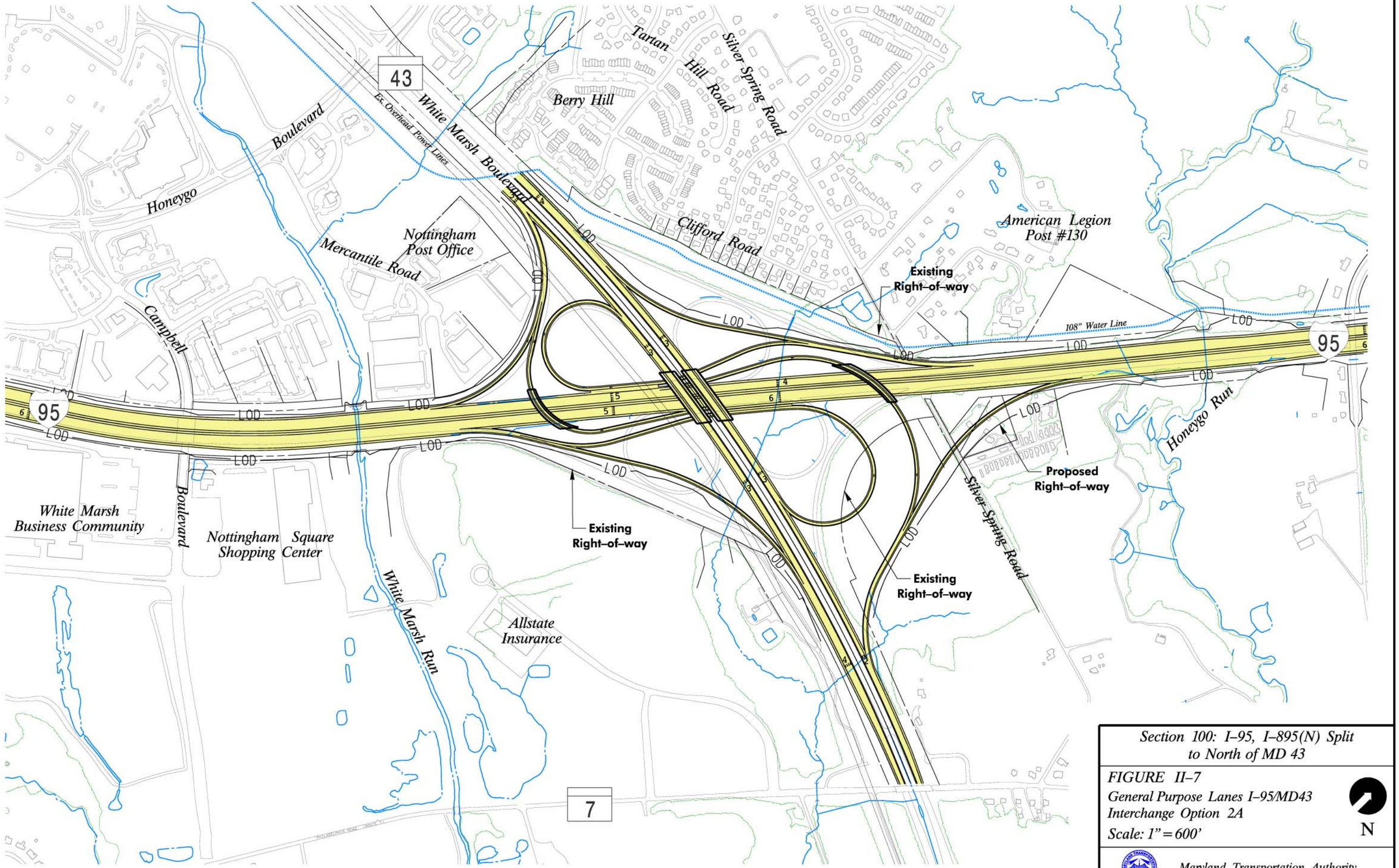

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE II–7
General Purpose Lanes I–95/MD43 Interchange Option 2A
Scale: 1" = 600'

Maryland Transportation Authority

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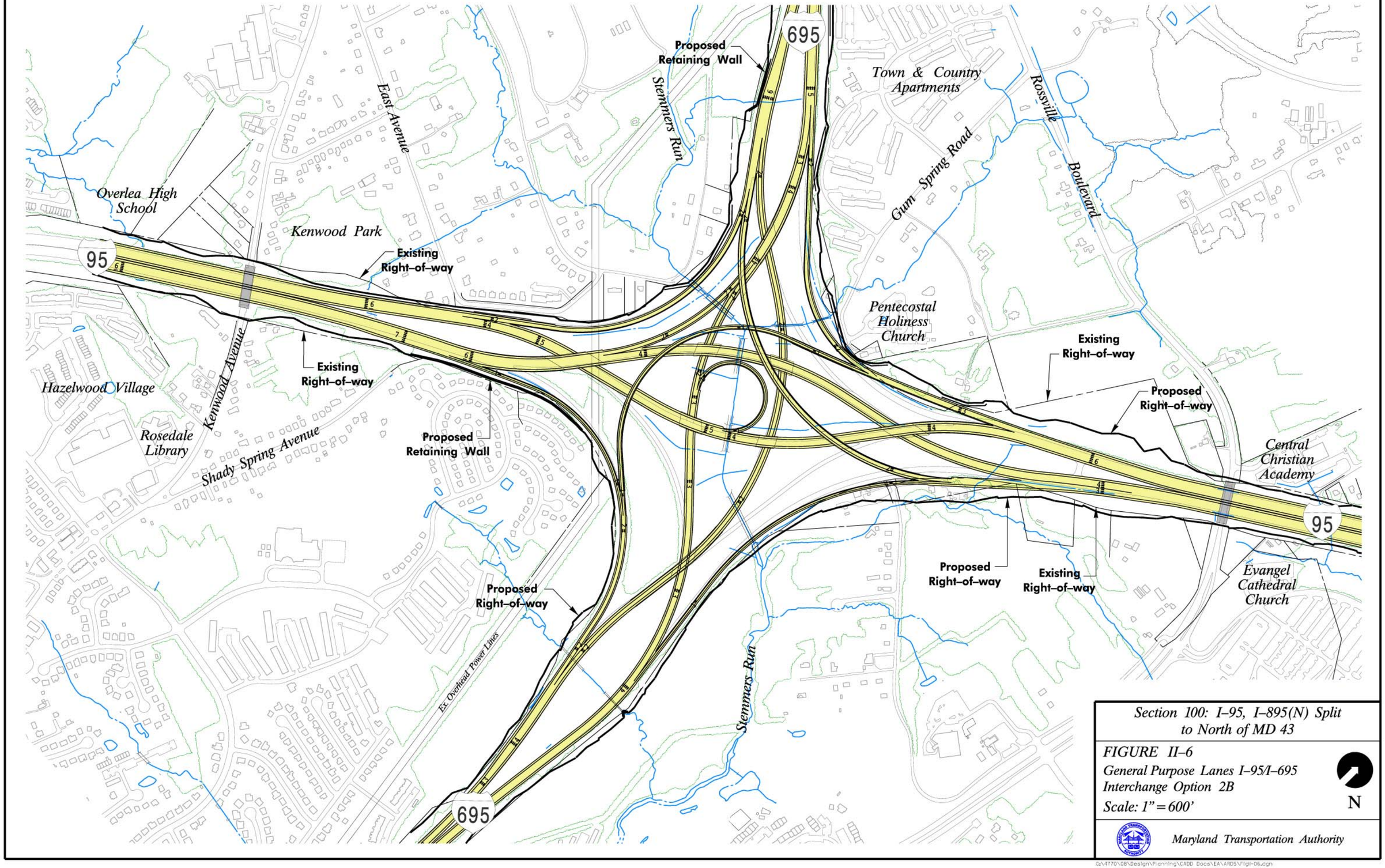

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE II–6

General Purpose Lanes I–95/I–695 Interchange Option 2B

Scale: 1" = 600'

N

Maryland Transportation Authority

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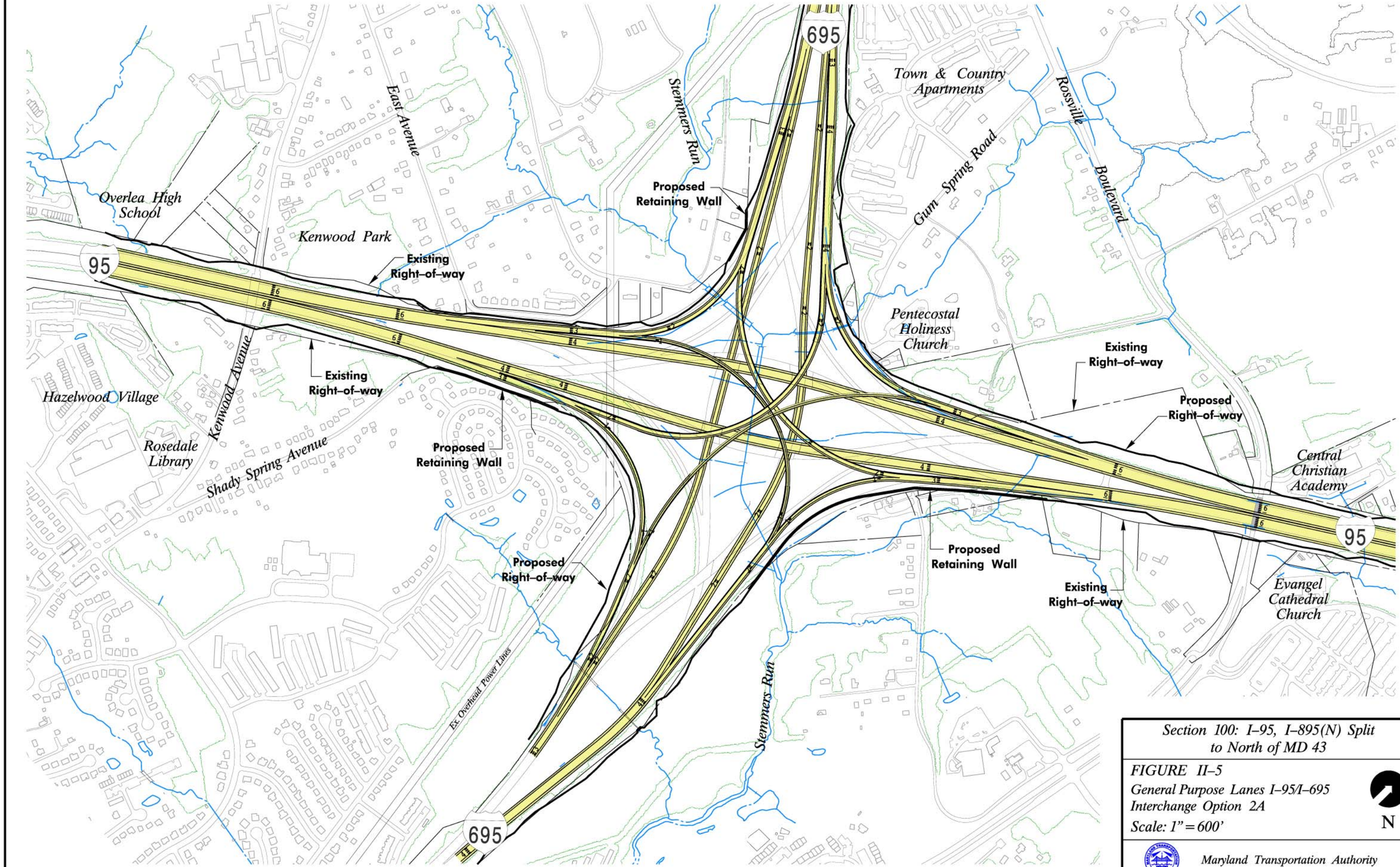

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE II–5

General Purpose Lanes I–95/I–695 Interchange Option 2A

Scale: 1" = 600'

Maryland Transportation Authority

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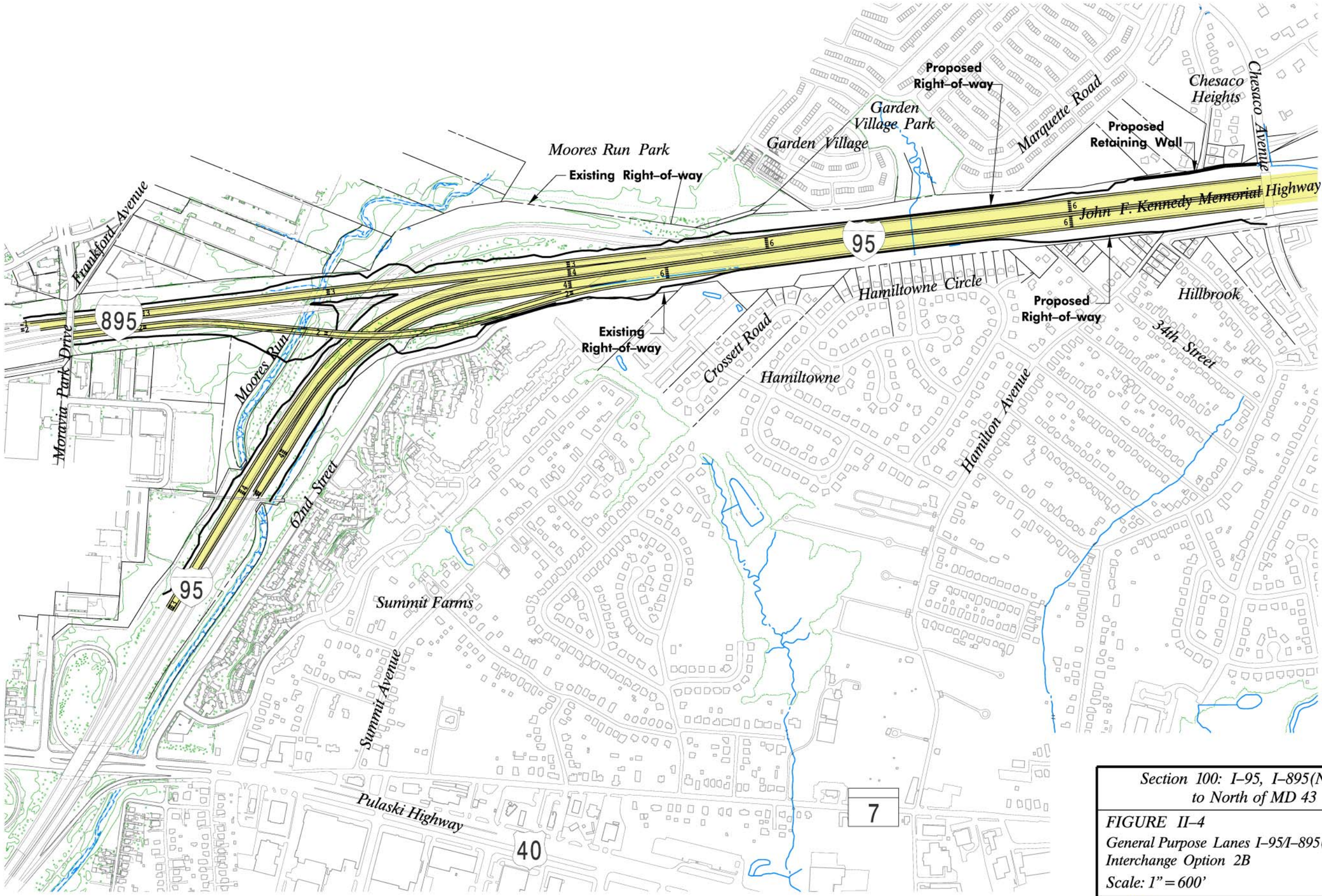

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE II–4

General Purpose Lanes I–95/I–895(N) Interchange Option 2B

Scale: 1" = 600'

N

Maryland Transportation Authority

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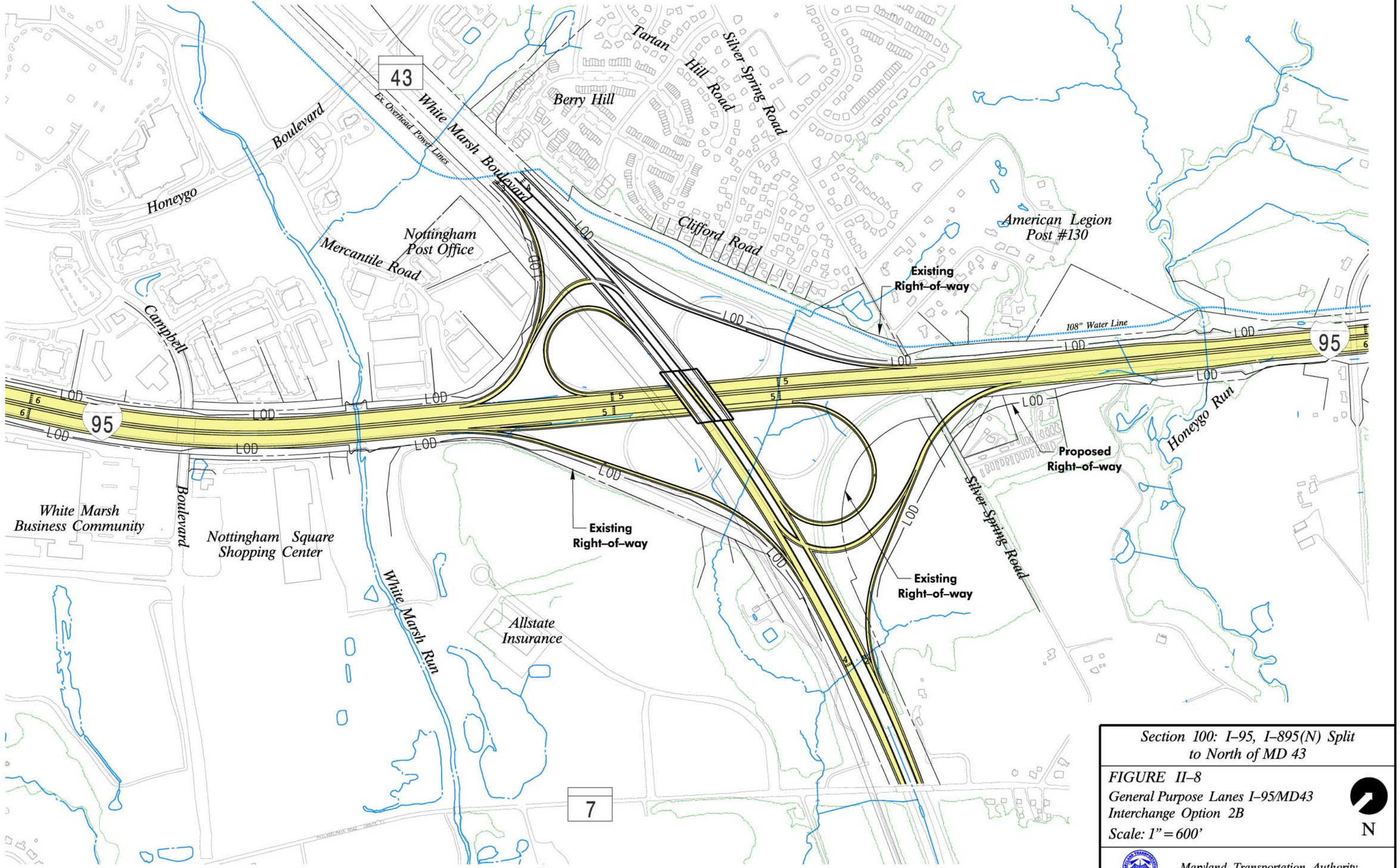

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE II–8

General Purpose Lanes I–95/MD43 Interchange Option 2B

Scale: 1" = 600'

Maryland Transportation Authority

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2. Managed Lanes Alternate

a. I-95/I-895(N) Interchange

Option 3A: This option would adjust the configuration of the existing interchange by relocating the southbound roadway of I-95 and the northbound roadway of I-895 to make I-95 the through movement in the interchange (***Figure II-9***). In this option, the I-95 managed lane access points would be within the median, while the I-895 managed lane access points would exit the general purpose lanes and span over the I-95 general purpose lanes to merge into the I-95 managed lanes.

Option 3B: Like the I-95/I-895(N) Interchange Option 3A, this option would adjust the configuration of the existing interchange to make I-95 the through movement in the interchange (***Figure II-10***). However, this option differs from 3A in that the managed lanes for I-895 would stay within the median, thereby not requiring the spanning of the I-95 general purpose lanes.

b. I-95/I-695 Interchange

Option 3A: This interchange option would improve the geometry and driver expectancy on I-95 by removing the braided mainline of I-95 and replacing all left-hand entrances and exits with more conventional right-hand entrances and exits (***Figure II-11***). However, the braided alignment would be retained on I-695 to make efficient connections between the I-95 and I-695 roadways. I-695 general purpose lanes would be reconfigured to make right-hand single point connections, despite the maintenance of the braided alignment on I-695.

Option 3A Modified: This option would take option 3A to the next step by removing the existing braid on I-695 as well as removing the braiding on existing I-95. Driver expectancy would be further improved by eliminating all left-hand entrance and exit ramps from the higher volume general purpose lanes. A few left-hand access points would still remain, but would only be located on the low volume managed lane ramps. This option would also best facilitate maintenance of traffic during construction by spanning the existing braids of I-95 with northbound and southbound I-95 managed lanes (***Figure II-12***).

Option 3B: Like the General Purpose Interchange Option 2B, this option would maintain the braided mainline roadways on both I-95 and I-695, and retain all left-hand exits and entrances, but would add managed lane movements as well as general purpose movements. The movement from westbound I-695 to southbound I-95 would be replaced with a loop ramp. This option would be compatible with potential future managed lanes along I-695 west of I-95 (***Figure II-13***).

c. I-95/MD 43 Interchange

Option 3A: This option would include a single exit point on each approach with direct connections provided for all interchange movements. All weaving within the interchange would be eliminated under this option. Single-lane ramps would provide for all movements to and from the managed lanes, with the lanes connecting directly to MD 43 at a signalized intersection on the structure over I-95 (***Figure II-14***).

Option 3B: The features of this option would be similar to the 3A Interchange Option, in that single-lane ramps would be provided for all movements to and from the managed lanes. In an effort to minimize impacts to the traffic flows on MD 43, however, the MD 43 lanes would be realigned to avoid the managed lane intersection. This option would require two more bridge structures over I-95 than Option 3A (***Figure II-15***).

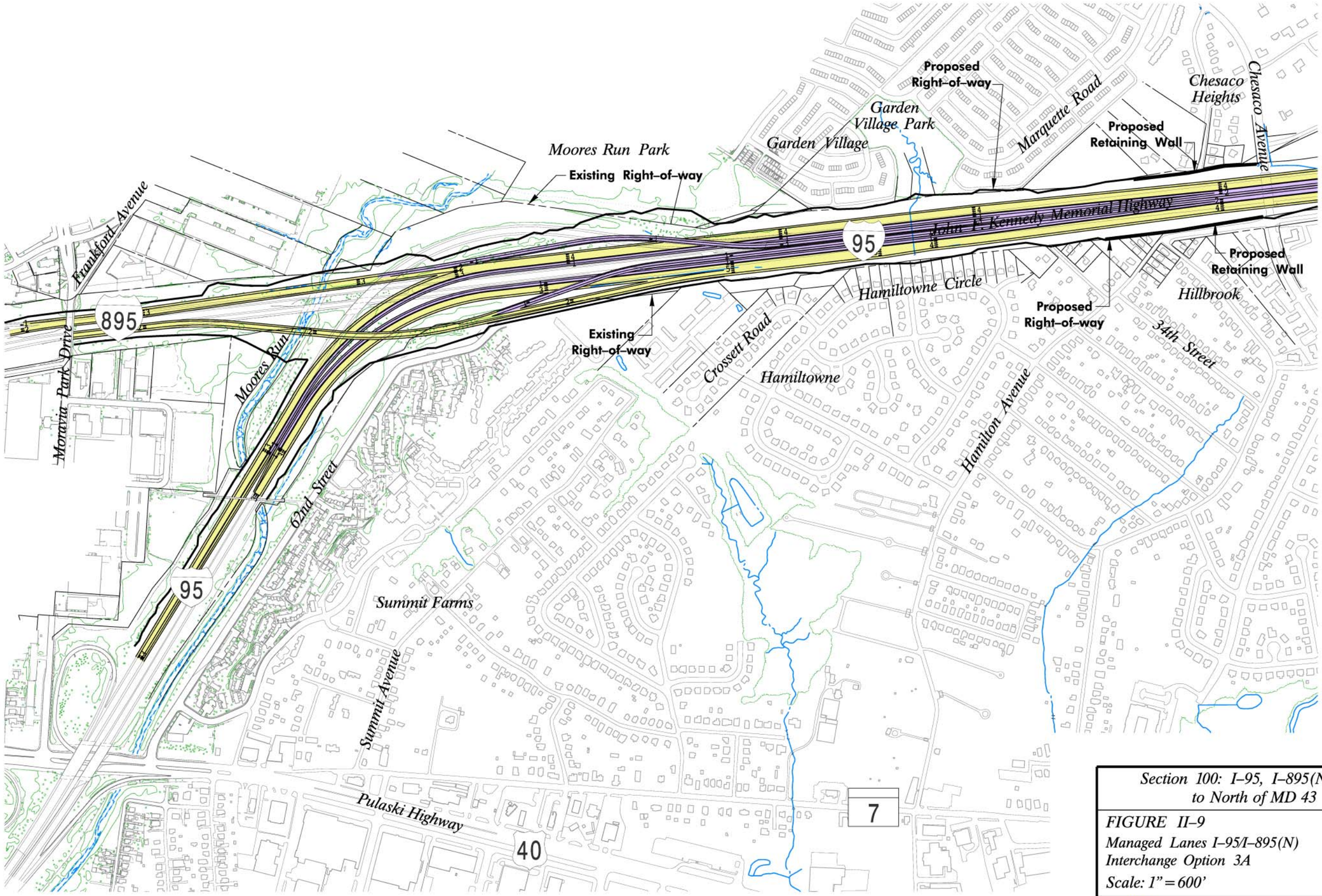
3. Analysis of Interchange Options

Interchange options were compared based on the analysis of: 1) operations/LOS; 2) design standards/exceptions; 3) environmental impacts; 4) displacements; 5) major utility involvement; 6) maintenance of traffic; 7) construction costs; and 8) maintenance considerations. These criteria were used to select one option per interchange for detailed study. The following summarizes the selected interchange options, and the reasoning behind their selection. The complete analysis summary for the I-895, I-695, and MD 43 Interchanges are provided in ***Table II-1, Table II-2, and Table II-3*** respectively.

a. General Purpose Lanes Alternate Interchange Options

I-95/I-895(N) Interchange: General Purpose Lanes Interchange Option 2B would provide route continuity with minimal cost difference to Option 2A. In comparison, Option 2A would be unable to provide route continuity and therefore would not best meet the capacity and safety needs of the project. Option 2A was therefore dismissed from further consideration, and Option 2B was retained for detailed study.

***I-95/I-695 Interchange*:** General Purpose Lanes Interchange Option 2A would best meet the safety needs of the project by providing substantial improvements regarding positive guidance such as signing and roadway markings, as well as driver expectancy. This would be accomplished by removing braided roadways and left-hand entries and exits. In addition, Option 2A would result in less environmental impacts than Option 2B. Based on this assessment, Option 2A was selected for detailed study, and Option 2B was dismissed from further consideration.



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

FIGURE II–9
Managed Lanes I–95/I–895(N) Interchange Option 3A
Scale: 1" = 600'

N

Maryland Transportation Authority

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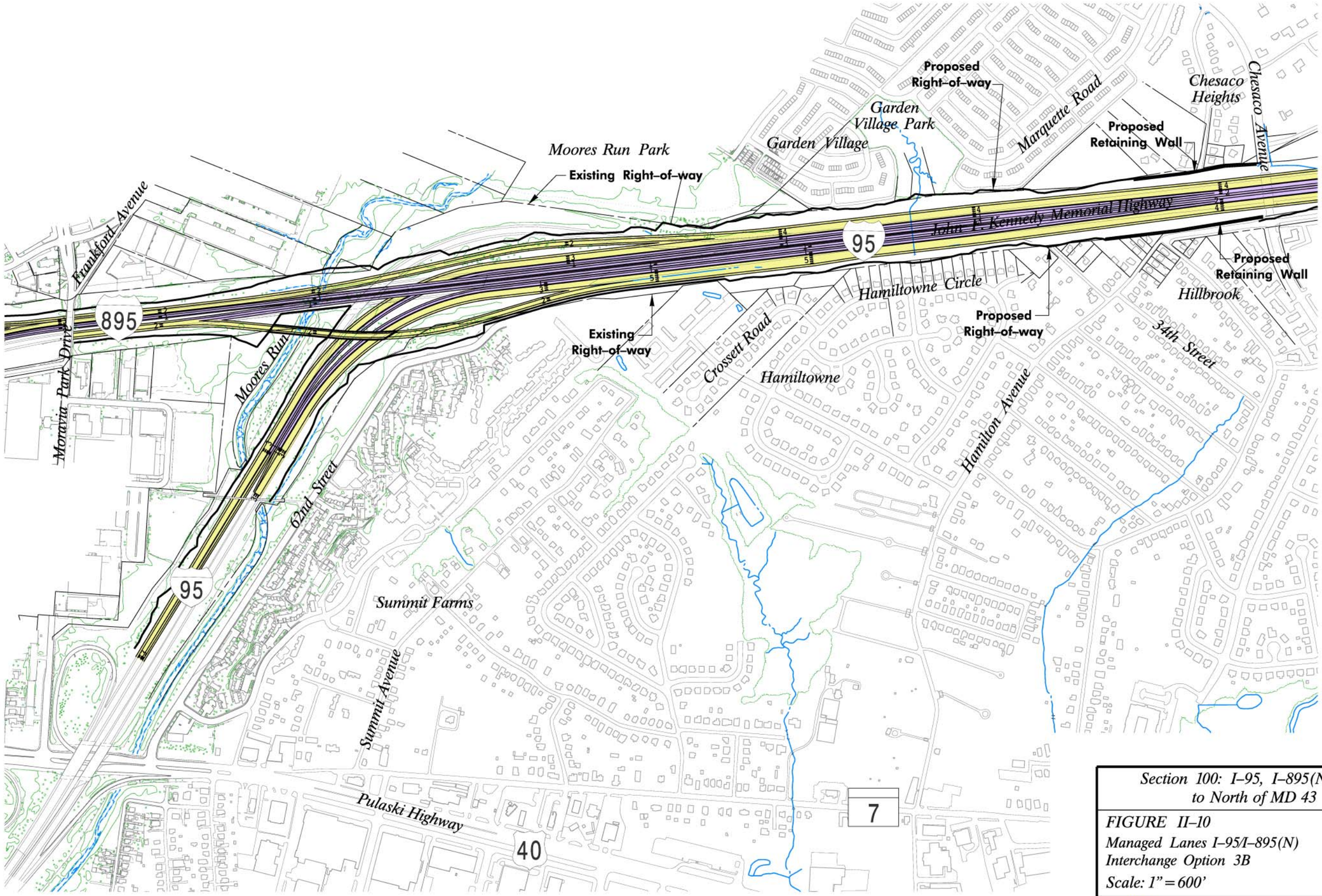

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE II–10
Managed Lanes I–95/I–895(N) Interchange Option 3B
Scale: 1" = 600'

N

Maryland Transportation Authority

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Proposed Right–of–way

695

Town & Country Apartments

Rossville Boulevard

Proposed Retaining Wall

Gum Spring Road

East Avenue

Stemmers Run

Overlea High School

Kenwood Park

95

Proposed Retaining Wall

Pentecostal Holiness Church

Existing Right–of–way

Proposed Right–of–way

Hazelwood Village

Kenwood Avenue

Rosedale Library

Shady Spring Avenue

Proposed Retaining Wall

Central Christian Academy

95

Proposed Retaining Wall

Existing Right–of–way

Proposed Right–of–way

Evangel Cathedral Church

Proposed Retaining Wall

Ex. Overhead Power Lines

Stemmers Run

695

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

FIGURE II–12

Managed Lanes I–95/I–695 Interchange Option 3A Modified

Scale: 1" = 600'

N

Maryland Transportation Authority

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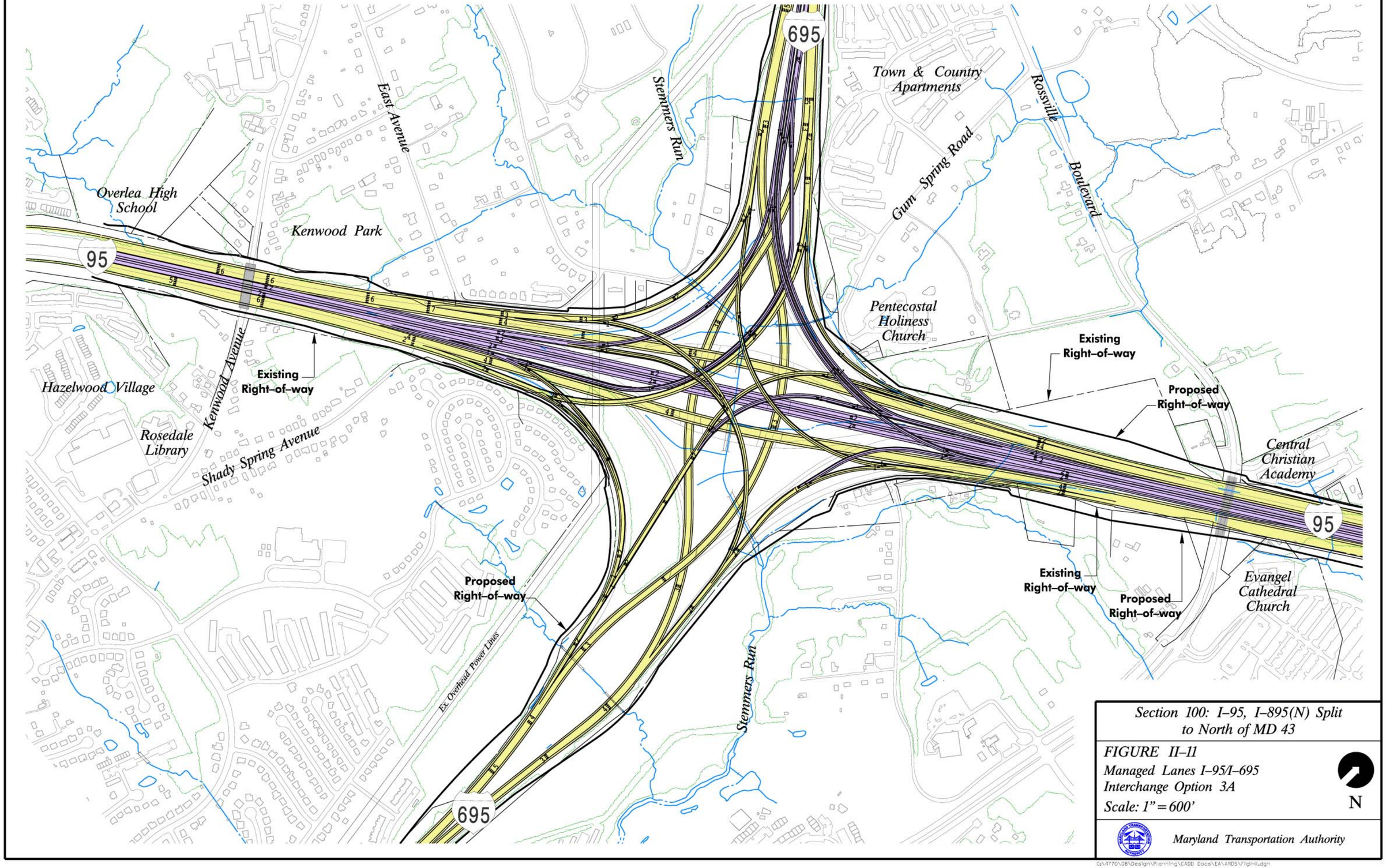

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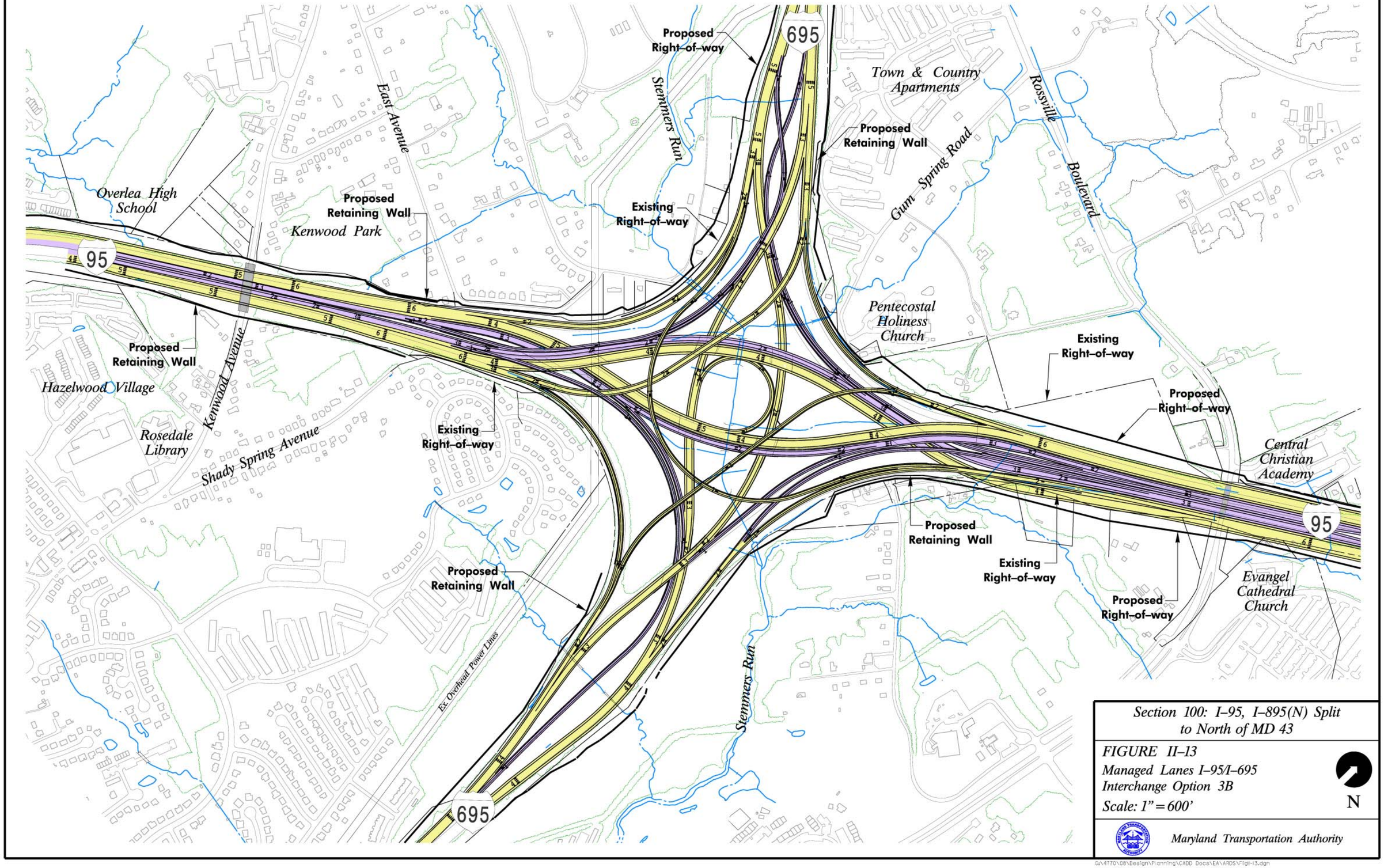

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE II–13
Managed Lanes I–95/I–695 Interchange Option 3B
Scale: 1" = 600'

N

Maryland Transportation Authority

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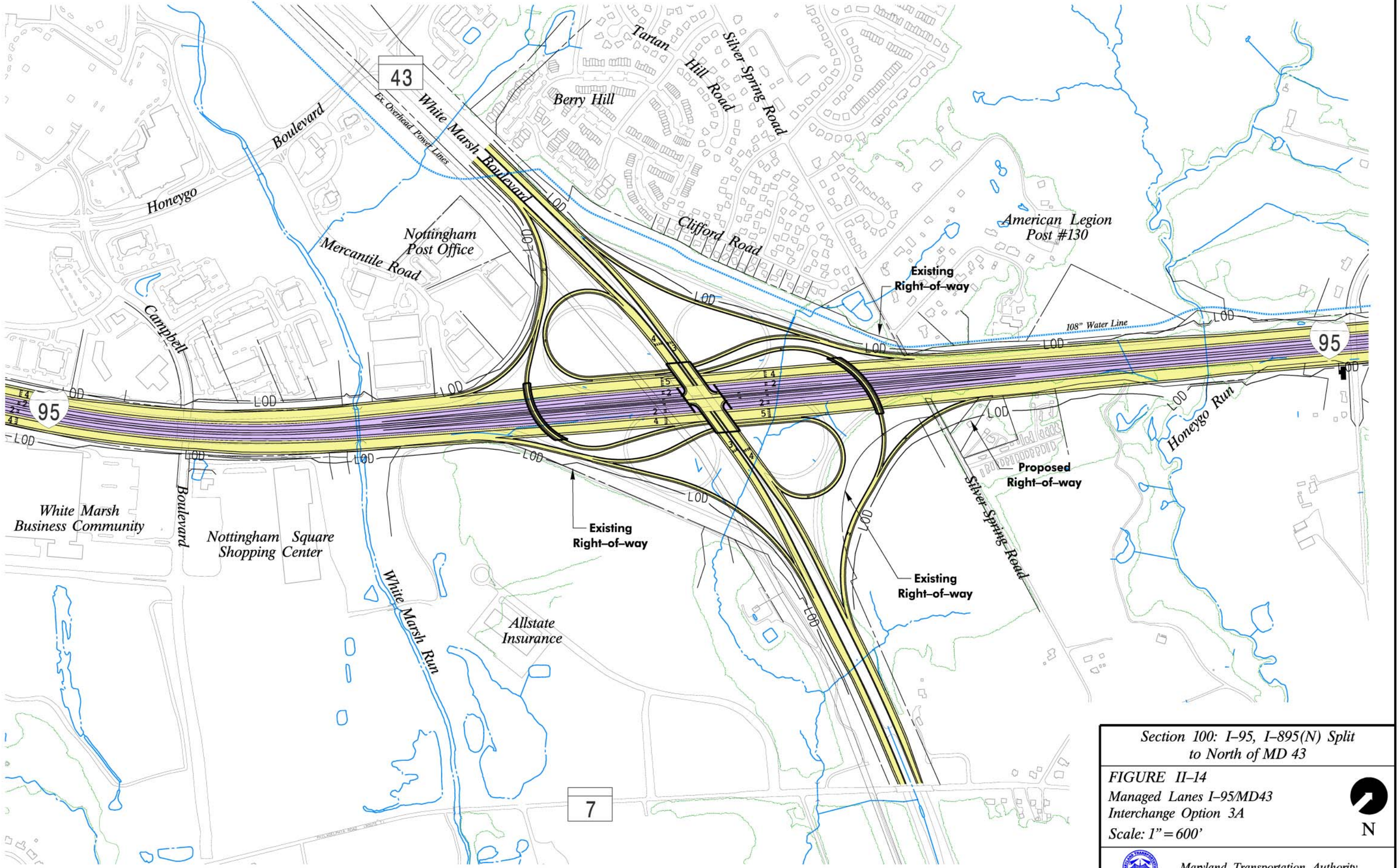

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE II–14
Managed Lanes I–95/MD43
Interchange Option 3A
Scale: 1" = 600'

N

Maryland Transportation Authority

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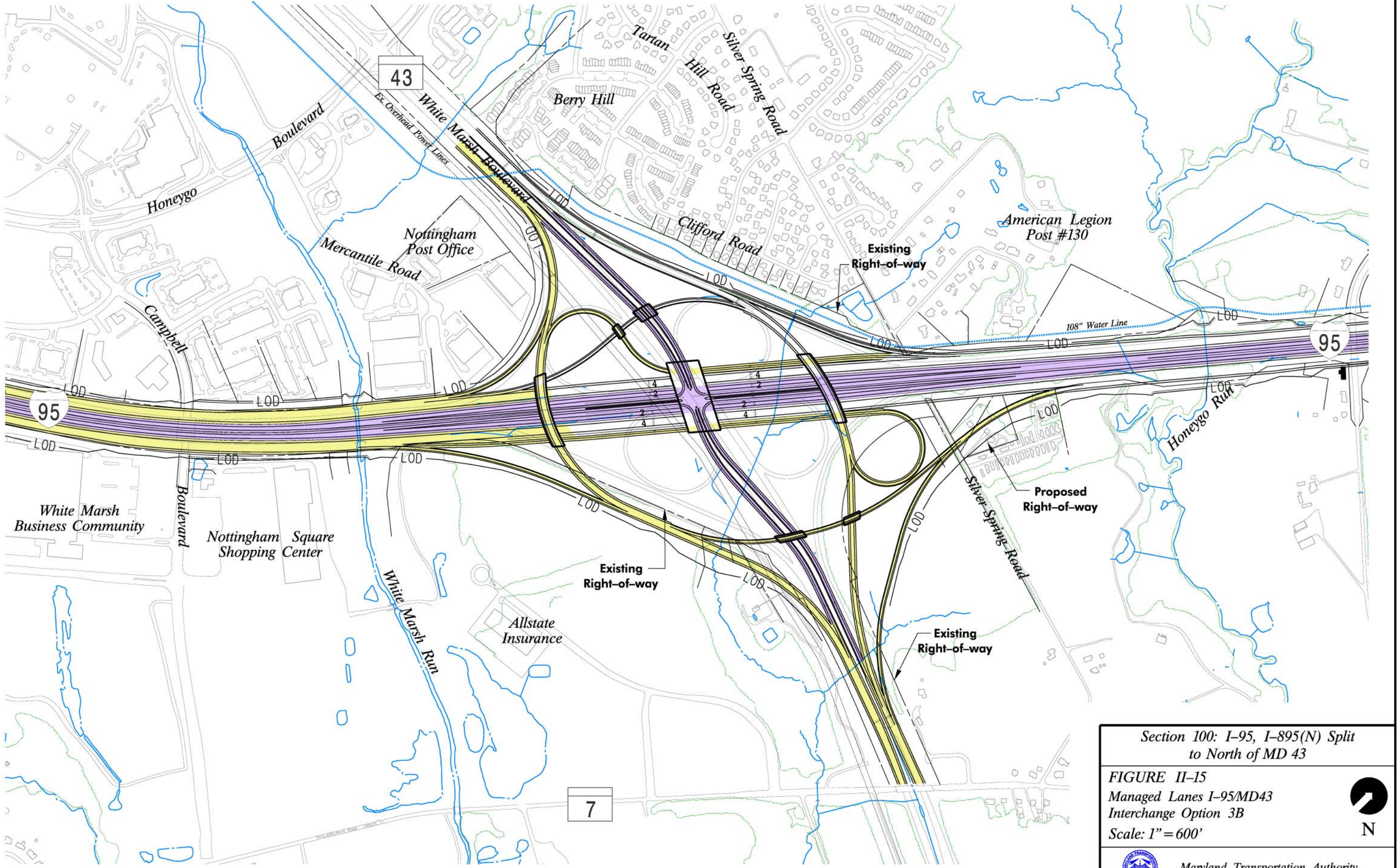

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE II–15
Managed Lanes I–95/MD43 Interchange Option 3B
Scale: 1" = 600'

N

Maryland Transportation Authority

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***I-95/MD 43 Interchange*:** General Purpose Lanes Interchange Option 2B would reduce impacts to the rubble landfill, require fewer structures over I-95, reduce impacts to adjacent development, and have no maintenance concerns, while providing the same LOS as Option 2A. Based on this assessment, Option 2B was found to best meet the project needs while minimizing impacts to the natural, cultural, and socio-economic environment, and was therefore selected for detailed study. Option 2A was dismissed from further consideration.

b. Managed Lanes Alternate Interchange Options

***I-95/I-895(N) Interchange*:** Managed Lanes Interchange Options 3A and 3B were very similar. However, studies showed that Option 3B would be easier to construct, require less right-of-way, and have no substantial difference in costs and environmental impacts as compared to Option 3A. Option 3B was therefore considered to best meet the needs of the project while minimizing impacts to the natural, cultural, and socio-economic environment, and was selected for detailed study. Option 3A was dismissed from further consideration.

***I-95/I-695 Interchange*:** Managed Lanes Interchange Option 3A Modified would best facilitate maintenance of traffic when compared to all other Managed Lanes Interchange Options. In addition, Option 3A Modified would have no substantial difference in environmental impacts compared to Option 3A, and would provide a higher design speed on the ramp from westbound I-695 to southbound I-95 compared to Option 3B. Based on this assessment, Option 3A Modified was found to best meet the project needs while minimizing impacts to the natural, cultural, and socio-economic environment, and was therefore selected for detailed study. Options 3A and 3B were dismissed from further consideration.

***I-95/MD 43 Interchange*:** Managed Lanes Interchange Option 3A would reduce impacts to the rubble landfill and minimize impacts to the existing power lines/substation. In addition, this option would eliminate the weaving sections, thereby best meeting the safety needs for the project. Based on this assessment, Option 3A was found to best meet the needs of the project while minimizing impacts to the natural, cultural, and socio-economic environment. Option 3A was therefore retained for detailed study, while Option 3B was dismissed from further consideration.

E. Alternates Retained for Detailed Study

Based upon the analyses described above, along with input gathered from the Focus Group and the November 18, 2003 Public Workshop (Chapter VI: *Coordination and Comments*), three alternates were recommended for further evaluation in detailed design. The following summarizes each of the ARDS.

Table II-1. I-895 Interchange Comparison Matrices

Evaluation Criteria	General Purpose Lane Alternative		Managed Lane Alternative	
	Option 2A	**Option 2B*** **	**Option 3A**	**Option 3B*** **
Operations / Level of Service	• The LOS design criteria for all interchanges of the General Purpose Lanes Alternate was LOS E or better. In comparing the No-Build to the General Purpose Lanes Alternate, this criteria provides significant improvements to the LOS for traffic in the peak direction during each peak hour.	• The LOS design criteria for all interchanges of the General Purpose Lanes Alternate was LOS E or better. In comparing the No-Build to the General Purpose Lanes Alternate, this criteria provides significant improvements to the LOS for traffic in the peak direction during each peak hour.	• *Pending. Goal is to provide LOS C for Managed Lanes* • Direct access is provided between the managed lanes to Moravia Road, but traffic exiting from the general purpose roadway to Moravia Road must weave with managed lanes traffic that proceeds southbound on I-895 through the Moravia Road interchange.	• *Pending. Goal is to provide LOS C for Managed Lanes.* • *Direct access, if warranted by traffic volumes, must be provided between the managed lanes to Moravia Road by direct connection to the Moravia Road overpass structure due to the short weaving distance across the I-895 general purpose lanes in each direction.*
Design Standards / Exceptions	• Widening without Geometric Improvement • Includes Left-hand Merge (NB I-895 to NB I-95 into dedicated lane) • Does not Provide Route Continuity • The I-895 interchange would continue to be deficient in regard to AASHTO criteria on route continuity • Left-hand merge (NB I-895 to NB I-95 into dedicated lane)	• Adjusts interchange geometry to provide route continuity along I-95 • Eliminates Left-hand Merge (NB I-895 to NB I-95 into dedicated lane)	• Southbound managed ramp flys over southbound I-95 general purpose lanes to access I-895 and Moravia Road. Northbound managed lane splits from northbound I-895 ramp and flys over northbound I-95 general purpose lanes to provide access to northbound I-95 managed lanes • Quicker tie-in to SB I-895 Road • Favors SB Managed Movement to Moravia Road. Lane Drop occurs on SB I-895 • Higher Profile of NB Managed with Respect to 62nd Ave • Higher Profile Of SB Managed with Respect to Schering Road • More Extensive Retaining Walls than 3B and General Purpose Options • Weave from SB Managed to Stay on SB I-895 • This option adjusts the existing interchange configuration to meet AASHTO requirements for route continuity. This option has flatter grades for I-895 relocated than Option 3B	• Median to Median Connections for Managed Lanes • Favors SB Managed Movement to SB I-895 • Lane Drop onto Moravia Road Off-ramp • Longer tie-in to SB I-895 • Off-ramp to Moravia Road overpass structure is required to provide direct access to Moravia Road from Managed Lanes of I-95 • This option improves positive guidance on the general purpose roadway by adjusting the interchange to meet AASHTO requirements for route continuity. Route continuity on the managed roadway can be addressed by adjustment of managed ramp locations • This option has steeper I-895 grades than option 3A.
Environmental Impacts	• Ties in Sooner on south leg of I-95 (lane drop with respect to tangent) • Least Impacts to Moores Run • No significant impact to existing noise walls anticipated	• Extended LOD for south leg of I-95 (lane drop with respect to tangent) • More Impacts to Moores Run than Option 2A. • No significant impact to existing noise walls anticipated	• This option provides the least impacts for the managed options as the managed and general purpose I-895 roadways split north of the Moores Run. • Noise Walls south of Chesaco Avenue are Impacted.	• This option can minimize impacts to wetlands and floodplain by bridging them, limiting impacts to the shading of wetlands under the managed and general purpose crossings over Moores Run • Noise Walls south of Chesaco Avenue are Impacted.
Displacements	• Least impact on existing development • 0 Displacements	• More impact to adjacent development than Option 2A • 0 Displacements	• This option results in greater right-of-way taking than option 3B to allow room for splitting the managed and general purpose roadways on the north side of the interchange. • There are no significant differences from the general purpose alternates with respect to displacements (none) or anticipated impacts to recreational facilities or historic or archeological sites. • 0 Displacements	• This option results in less right-of-way taking than option 3A as the managed and general purpose roadways split south of the interchange in an undeveloped area. There are no significant differences from the general purpose alternates with respect to displacements (none) or anticipated impacts to recreational facilities or historic or archeological sites. • 0 Displacements
Maintenance of Traffic	• Simple MOT	• More extensive MOT than 2A due to relocation of I-95 roadway.	• More difficult to construct	• Easier to construct than 3A.
Construction Costs	**$40 million -** Includes cost of rehabilitating and widening existing overpass structure for SB I-95	**$43 Million**	**$75 million.** Highest cost due to larger scope for structures.	**$73 million.** Does not include cost for direct connection to Moravia Road.
Maintenance Considerations	• Emergency crossovers are feasible between interchanges.	• Emergency crossovers are feasible between interchanges.	• Emergency crossovers may be feasible for managed lanes, but access between general purpose roadway must be provided via interchanges.	• Emergency crossovers may be feasible for managed lanes, but access between general purpose roadway must be provided via interchanges.
RECOMMENDED FOR DETAILED STUDY?	**No** - Does not provide route continuity.	**Yes** - Provides route continuity with minimal cost difference over Option 2A. Environmental impacts can further be minimized through spanning Moores Run.	**No**	**Yes** - Easier to Construct. No significant difference in cost and environmental impacts.

*** Options recommended for detailed study

Table II-2. I-695 Interchange Comparison Matrices

Evaluation Criteria	General Purpose Lane Alternative		Managed Lane Alternative		
	Option 2A* **	**Option 2B**	**Option 3A**	**Option 3A Modified*** **	**Option 3B**
Operations / Level of Service	• The LOS design criteria for all interchanges of the General Purpose Lanes Alternate was LOS E or better. In comparing the No-Build to the General Purpose Lanes Alternate, this criteria provides significant improvements to the LOS for traffic in the peak direction during each peak hour.	• The LOS design criteria for all interchanges of the General Purpose Lanes Alternate was LOS E or better. In comparing the No-Build to the General Purpose Lanes Alternate, this criteria provides significant improvements to the LOS for traffic in the peak direction during each peak hour.	• Pending. Goal is to provide LOS C for Managed Lanes	• Pending. Goal is to provide LOS C for Managed Lanes	• Pending. Goal is to provide LOS C for Managed Lanes.
Design Standards / Exceptions	• Modifies Existing Geometry to Replace All Left-Hand Merges/Diverges with Right-Hand. Requires removal of braided mainlines on both I-95 and I-695 • All Right-hand Entries and Exits • Removal of Braided Alignments Better Facilitates Future Capacity Improvements on Mainlines • Directional Ramp from WB to SB provides Higher Design Speed (50 mph) than Loop Ramp • Improves Tangent Lengths between Reverse Curves on Existing Interchange. • Directional Ramps and Mainline Connections to Reverse Traffic Flow in Braided Areas Must Be Constructed Before Removal of Braided Alignment, Resulting in Greatest MOT Complexity and Longest Project Duration of General Purpose Options. • Highest Interchange Profile of General Purpose Options.	• Retains Existing Geometry Except for Construction of Directional Connections to CD Roadway and Loop Ramp • Left-Hand Merges/Diverges Accommodate Higher Design Speeds for Ramps • Structures and Ramp Locations for Braided Roadways Limit Future Capacity Improvements for Both I-95 and I-695. • Design Speed Limited to 30 mph on Loop Ramp for movement from WB I-695 to SB-I-95. • Retains Deficient Tangent Lengths between Reverse Curves on Braided Roadways. • Directional Ramps and Mainline Connections to Reverse Traffic Flow in Braided Areas Must Be Constructed Before Removal of Braided Alignment, Resulting in Greatest MOT Complexity and Longest Project Duration of All Options. • Lowest Interchange Profile.	• Removes Braided Mainline on I-95 to Reduce Number of Left-Hand Merge/Diverge Movements and Improve I-95 Geometrics • No Left Merges/Diverges for Managed Roadways on I-95 • Removal of Braided Alignment Better Facilitates Future Capacity Improvements for I-95. • Directional Ramp from WB to SB General Purpose provides Higher Design Speed (50 mph) than Loop Ramp • Addresses Deficient Tangent Lengths between Reverse Curves on Existing Interchange Modest footprint • Higher interchange profile than Options 2A, 2B and 3B.	• Removes Braided Mainline on I-95 and I-695 to Reduce Number of Left-Hand Merge/Diverge Movements and Improve Geometrics on both Roadways • No Left Merges/Diverges for Managed Roadways on I-95. • Removal of Braided Alignment Better Facilitates Future Capacity Improvements for both I-95 and I-695. • Directional Ramp from WB to SB General Purpose provides Higher Design Speed (50 mph) than Loop Ramp • Addresses Deficient Tangent Lengths between Reverse Curves on Existing Interchange Modest footprint • Highest interchange profile.	• Retains Existing Geometry Except for Construction of Directional Connections to CD Roadway and Managed Roadways. • Requires Left-hand Merges (constrained by Lane Drops) for Managed Roadways on I-95 • Structures and Ramp Locations for Braided Alignment Limit Future Capacity Improvements for Both I-95 and I-695. • Low Design Speed (30 mph) for Loop Ramp • Retains Deficient Tangent Lengths between Reverse Curves on Braided Roadways. • Higher interchange profile than General Purpose Alternatives, but Lower than Other Managed Options. • Currently Includes Broken-back Alignments.
Environmental Impacts	• See Table 3	• See Table 3	• See Table 4	• See Table 4	• See Table 4
Displacements	• 4 Displacements • Wider footprint in SW Quadrant and Narrower Footprint in NE Quadrant than Option 2B.	• 4 Displacements • Narrower footprint in SW Quadrant and Wider Footprint in NE Quadrant than Option 2A. Footprint in NE Quadrant could be minimized by introducing compound curvature for Ramp GH.	• 9 Displacements • Wider Footprint in SE Quadrant	• 9 Displacements • Widest Footprint of All Options.	• 8 Displacements • Lessened Footprint in SE Quadrant
Major Utilities	• Impacts 4 electric transmission towers	• Does not impact electric transmission lines	• Impacts 10 electric transmission towers	• Impacts 10 electric transmission towers	• Impacts 10 electric transmission towers
Maintenance of Traffic	• Directional Ramps and Mainline Connections to Reverse Traffic Flow in Braided Areas Must Be Constructed Before Removal of Braided Roadways, Resulting in Greatest MOT Complexity and Longest Project Duration of the General Purpose Options.	• MOT on I-95 primarily accomplished through widening and traffic shifts, resulting in greater MOT complexity and project duration than Option 3A-Mod.	• Directional Ramps and Mainline Connections to Remove Braided Roadways will Complicate MOT and Lengthen Project Duration over all other identified Options.	• Facilitates MOT and lessens Construction Duration on I-95 Mainline by relocating I-95 traffic to Managed Roadway while General Purpose Roadways are Constructed. MOT on I-695 is facilitated by connecting general purpose ramps outside braided roadways. Less temporary roadways required than other managed options.	• MOT on I-95 primarily accomplished through widening and traffic shifts, resulting in greater MOT complexity and project duration than Option 3A-Modified.
Construction Costs	**$236 million**	**$208 million**	**$363 million**	**$406 million** - Note that significant MOT Savings are anticipated but cannot be quantified without preparation of MOT plans for comparison.	**$344 million**
Maintenance Considerations	• Emergency crossovers are feasible between interchanges. • Greater Height and Longer Lengths of Bridges than Option 2B.	• Emergency crossovers may be feasible for managed lanes, but access between general purpose roadway must be provided via interchanges. • Lowest Heights and Shortest Lengths of Bridges of any Option.	• Emergency crossovers may be feasible for managed lanes, but access between general purpose roadway must be provided via interchanges. • Median (in numeric sense) Height and Median Length Bridges for Managed Options.	• Emergency crossovers may be feasible for managed lanes, but access between general purpose roadway must be provided via interchanges. • Highest and Longest Bridges of Any Option.	• Emergency crossovers may be feasible for managed lanes, but access between general purpose roadway must be provided via interchanges. • Lowest and Shortest Bridges of Any Managed Option.
RECOMMENDED FOR DETAILED STUDY?	**Yes** - Significant Improvements in Regard to Positive Guidance and Driver Expectancy by Removing Braided Roadways and left-hand entries and exits. Less Environmental Impacts than Option 2B.	**No**	**No**	**Yes** - Best facilitates MOT among all Managed Options. No significant difference in impacts from Option 3A. Higher design speed on ramp from WB I-695 to SB-I-95 than reflected in Option 3B. Significant improvements in regard to positive guidance and driver expectancy on both I-95 and I-695 by removing braided	**No**

*** Options recommended for detailed study

Table II-3. MD 43 Interchange Matrices

Evaluation Criteria	General Purpose Lane Alternative		Managed Lane Alternative	
	Option 2A	**Option 2B*** **	**Option 3A*** **	**Option 3B**
Operations / Level of Service	• LOS E or better for weekday operations	• LOS E or better for weekday operations	• LOS E or better for weekday operations**	• LOS E or better for weekday operations***
Design Standards / Exceptions	• Fully direction interchange eliminates weaving sections along I-95 • Two high volume (>1,000 vph), low speed (<35 mph) loop ramps • No signalized intersections • All right-hand entries and exits • Ramp from SB I-95 to WB MD 43 relocated further east of Honeygo Blvd intersection • Improves tangent lengths between curves	• Partial cloverleaf configuration eliminates weaving sections along I-95 • Two high volume (>1,000 vph), low speed (<35 mph) loop ramps • Two partial traffic signals required on MD 43 • Ramp from SB I-95 to WB MD 43 relocated further east of Honeygo Blvd intersection • Improves tangent lengths between curves	• Fully direction interchange eliminates weaving sections along I-95 • Two high volume (>1,000 vph), low speed (<35 mph) loop ramps • Signal control of MD 43 through traffic • Managed lane intersects directly with MD 43 at a traffic signal	• MD 43 through lanes split around separate managed lane interchange • One high volume (>1,000 vph), low speed (<35 mph) loop ramp • Two left-side exits (EB MD 43 to NB I-95, WB MD 43 to SB I-95) and one left side entrance (SB I-95 to EB MD 43) • Weaving section created on EB MD 43 • All managed lane traffic enters/exits MD 43 on the left • Vertical constraints limit design speed on MD 43
Environmental Impacts	• Within existing footprint, except the NE quadrant (rubble landfill)	• Less impacts to rubble landfill	• Minor impacts to rubble landfill	• Major impacts to rubble landfill
Displacements	• More impacts to adjacent development • 3 Displacements	• Less impacts to adjacent development • 2 Displacements	• Minor impacts to adjacent development • 2 Displacements	• None • 5 Displacements
Major Utilities	• No impacts to existing power lines/substation • No impact to 108” water main	• No impacts to existing power lines/substation • No impact to 108” water main	• No impacts to existing power lines/substation • No impact to 108” water main	• Potential relocation of overhead electric transmission towers/lines • No impact to 108” water main
Maintenance of Traffic	• Construction of four separate structures over I-95	• Construction of two separate structures over I-95 (two less than Option 2A)	• Requires reconstruction of interchange then construction of managed lanes • Construction of two separate structures over I-95	• Construction of three separate structures over I-95
Construction Costs	• **$98 million**	• **$91 million**	• **$166 million**	• **$188 million**
Maintenance Considerations	• Re-decking of two single lane bridges	• None	• Access to managed lanes at interchanges only • Re-decking of two single lane bridges	• Access to managed lanes at interchanges only
RECOMMENDED FOR DETAILED STUDY?	**NO**	**YES –** This option provides an acceptable LOS in the Design Year with a cost significantly lower than the remaining options.	**YES –** This option provides acceptable LOS for a significant reduction in cost over 3B and 3B Modified.	**NO**

** Levels of service are based on the latest available managed lane traffic volume projections. The managed lane strategy to be implemented is still under investigation, and thus the LOS results are subject to change. It is anticipated that the options could be modified slightly as necessary to accommodate any changes in projected managed lane traffic volumes.

*** Options recommended for detailed study

1. Alternate 1 - No-Build

The No-Build Alternate would be restricted to normal maintenance and safety improvements. There would be no increase in roadway capacity, and I-95 would remain four lanes in each direction from the I-895(N) split to approximately the New Forge Road overpass. As a result, LOS would continue to degrade, and there would be no reduction in the accident rate. This alternate was carried as a baseline for comparison.

2. Alternate 2 - General Purpose Lanes

The General Purpose Lanes Alternate (***Appendix A, Plates 1-26***) would operate at peak hour/peak direction LOS E, and would consist of:

- Four lanes in each direction on I-95 from approximately ¼ mile south of the I-895 Interchange to the point where I-95 merges with I-895,
- Six lanes in each direction between the I-895(N) split and MD 43,
- North of MD 43, the roadway would transition from six lanes in each direction to the existing four lanes in each direction,
- Incorporation of the I-95/I-895(N) Interchange Option 2B (as described in Section II-D1a and ***Figure II-4***),
- Incorporation of the I-95/I-695 Interchange Option 2A (as described in Section II-D1b and ***Figure II-5***), and
- Incorporation of the I-95/MD 43 Interchange Option 2B (as described in Section II-D1fc and ***Figure II-8***).

Additional details regarding Alternate 2 and the proposed interchange options can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43, ARDS Report* prepared for this project. A typical section is provided in ***Figure II-1*** (without C-D Roadways).

3. Alternate 3 - Managed Lanes

The Managed Lanes Alternate would include two managed lanes in each direction from I-895 to north of MD 43, plus additional general purpose lanes. This alternate would generally operate in the peak hour/peak direction at LOS E in the general purpose lanes and at LOS D or better in the managed lanes, and would require the following (***Appendix B, Plates 27-52***):

- Four general purpose lanes in each direction of I-95 from approximately ¼ mile south of the I-895 Interchange to the point where I-95 merges with I-895,
- Two managed lanes and four general purpose lanes in each direction between the I-895(N) split and I-695,
- Two managed lanes and four general purpose lanes in each direction between I-695 and MD 43,
- North of MD 43, the roadway would transition from the six-lane section (two-lane managed and four-lane general purpose) in each direction into the existing four lanes in each direction),

- Incorporation of the I-95/I-895(N) Interchange Option 3B (as described in Section II-D2a and ***Figure II-10***),
- Incorporation of the I-95/I-695 Interchange Option 3A Modified (as described in Section II-D2b and ***Figure II-12***), and
- Incorporation of the I-95/MD 43 Interchange Option 3A (as described in Section II-D2c and ***Figure II-14***).

The managed lanes could operate under a single management strategy 24-hours per day, or on a "time-share basis" with different restrictions at different times of day. Management strategies could include restrictions at access locations (ramps), by time of day (peak/off-peak), by vehicle-type (trucks/buses), by type of use (commercial/HOV), or by price (variable or fixed). Managed lanes would be designed for flexibility so that management strategies could be modified over time to maximize person-moving capacity, optimize vehicle carrying capacity, and achieve transportation and community goals.

Additional details regarding Alternate 3 and the proposed interchange options can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43, ARDS Report* prepared for this project. A typical section is provided in ***Figure II-2***.

F. Comparison of Alternates

The following discussion is a comparison of the General Purpose Lanes and Managed Lanes Alternates, based on five categories of evaluation criteria including ability to meet purpose and need, environmental impacts, operational efficiency, fiscal responsibility, and regulatory compliance.

[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]

1. Ability to Meet Purpose and Need

a. *Congestion*

[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]

Table II-4 provides a summary of the future LOS for the alternates considered. Overall, the Managed Lanes Alternate would better accommodate traffic and minimize congestion. Managed lane strategies preserve a portion of the highway capacity for priority needs by providing opportunities for eligible vehicles to maintain generally free flow speeds on the designated lanes. Managed lanes could establish stable travel speeds and vehicle spacing, thus maximizing vehicle throughput on the highway.

On I-95 Section 100, the Managed Lanes Alternate would be better at providing superior service for motorists that utilize the managed lanes (separated from the general purpose lanes) which are anticipated to be operated at or above LOS D during weekday peak periods. The LOS for the managed lanes would vary depending upon the strategy that was utilized. The operation of the managed lanes would affect the LOS for the general purpose lanes depending on the number of trips that are not taken, are made during a non-peak period of travel and/or change travel modes. The managed lane strategies could range from forms of pricing to vehicle type or use to access control to time of day. Each strategy would present unique characteristics causing trade-offs between the associated LOS. These management strategies may be combined and modified to achieve changing regional transportation goals. Maximum flexibility of a managed lane system will best meet changing needs for the safe and efficient movement of people and goods across all transportation modes. One of the keys to the success of the managed lanes concept is the ability to alter the operation of the lanes in ways that keep traffic flowing and provides flexibility for the lanes to be open to more or different user groups, during day-to-day operations of the lanes or in situations where isolated incidents such as major accidents or other events block the movement of traffic.

One of the potential benefits of managed lanes is the ability to manage peak demand and satisfy mobility needs by encouraging shifts in travel time from the peak demand period to periods of lower demand. Highways could be priced to encourage travel during off-peak periods of demand while offering travel choices during peak periods of demand.

The Managed Lane Alternate is designed to maintain management strategy options. This flexibility will allow for adjustments over time to provide for predictable and dependable travel times and speeds. Predictable travel times promote transit by providing reliable service due to a known consistent level of service along the roadway.

Table II-4. Project Weekday 2025 LOS Summary

Alternate	Roadway Section		AM Peak Period		PM Peak Period	
			NB	SB	NB	SB
No-Build	I-895 to I-695		D	F	F	D
	I-695 to MD 43		D	F	F	E
General Purpose Lanes	I-895 to I-695		B	E	E	C
	I-695 to MD 43		C	E	E	C
Managed Lanes(1)	I-895 to I-695	ML	A	A-D	A-D	A
	I-895 to I-695	GP	C	E-F	E-F	C
	I-695 to MD 43	ML	A	A-C	A-D	A
	I-695 to MD 43	GP	C	E-F	E-F	D
(1) Varying management strategies for the Managed Lanes Alternate will influence the anticipated level of service.						

b. Safety

[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]

Roadway safety is often influenced by the number of lanes in each direction. For example, if there are too few lanes, it may be difficult for vehicles behind a slower moving vehicle to transfer out of that lane, as the other lanes may already be operating at high capacity. On the other hand, the operator of a disabled vehicle can find it difficult to maneuver onto the shoulder if there are too many lanes to cross.

The General Purpose Lanes Alternate would consist of six contiguous lanes in each direction; this could generate difficulty for disabled vehicles trying to access the shoulder, and would increase the number of lanes that a driver must traverse to exit the highway.

The Managed Lanes Alternate would consist of two contiguous managed lanes and four contiguous general purpose lanes in each direction, with a concrete traffic barrier separating the two roadway types. The managed lanes are expected to be operated at LOS D or better, thereby allowing for gaps in traffic where vehicles can switch lanes to pass other drivers. By separating the general purpose and managed lanes and providing a maximum of four contiguous lanes, safety would be enhanced through a reduction of lanes to be traversed when entering or exiting, and allowing disabled vehicles to more easily access the shoulder.

The provision of managed lanes could reduce congestion, improve emergency response times, separate vehicles by size, and/or reduce the number of conflict points between vehicles, thereby providing opportunities for improved public safety. In addition, the

managed lanes alternate could improve work zone safety by allowing for off-peak closures of the managed or general purpose system thus reducing conflict points between motorists and maintenance or construction activities.

c. Intermodal Access

[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]

Section 100 provides access to the Port of Baltimore, Baltimore Washington International (BWI), and Martin State Airports, Amtrak rail service, and the local transit system. In order to provide dependable intermodal connectivity, it is important that highway travel times remain fairly consistent, and that those times be perceived as reasonable by users.

The General Purpose Lanes Alternate would involve the addition of lanes as necessary to accommodate the projected traffic volumes. This alternate would have a moderate effect on bus transit in the Section 100 corridor. Although the capacity of I-95 would increase in Section 100, all travelers including transit services would experience decreasing benefits as traffic volumes grow over time.

The Managed Lanes Alternate would involve the addition of two managed lanes per direction between I-895 and north of MD 43. This alternate would also include four general purpose lanes to accommodate projected traffic volumes. Bus transit could benefit from the implementation of managed lanes. Managed lane strategies preserve a portion of the highway capacity for priority needs by providing opportunities for eligible vehicles, such as buses, to maintain generally free-flow travel speeds on designated lanes. By utilizing the managed lanes buses could benefit from the higher level of service that could be provided in these managed lanes. Managed lanes could improve the attractiveness of transit services by providing reliable and predictable transit service times. Therefore by implementing managed lanes, bus ridership would likely increase. Access to and from the managed lanes at interchanges where transit services are planned would be considered in the design of the Managed Lanes Alternate.

The success of a managed lane system hinges on a user's ability to consistently experience a predictable travel time and a facility operator's ability to consistently manage traffic volumes to provide the expected travel speed and travel time with a high degree of certainty. Predictable travel times create advantages for transport fleets with schedules to meet such as those engaged in transit services or commercial "just in time" freight delivery services.

Based on this assessment, the Managed Lanes Alternate would best provide for intermodal access, because it is anticipated that the managed lanes would operate at LOS D or better, thereby providing faster, more consistent travel conditions as compared to the General Purpose Lanes Alternate, which would operate at LOS E during weekday peak periods.

2. Environmental Impacts

a. Natural and Human Environment

[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]

Managed lanes could provide long term environmental benefits by reducing the need for future highway widening and the associated environmental impacts. Managed lanes could also provide short-term environmental benefits such as reduced vehicle emissions by establishing a stable travel speed.

A detailed comparison of the natural and human environmental impacts are included in Chapter IV: *Environmental Consequences.*

b. Land Use Impacts

[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]

A detailed comparison of the land use impacts is included in Chapter IV: *Environmental Consequences.*

3. Operational Efficiency

a. Incident Management

[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]

It is essential that police, fire, rescue, and maintenance personnel be able to respond quickly to an incident by accessing the site, assessing the nature of the incident, and taking appropriate measures. To that end, both of the Build Alternates have been designed with 14-foot shoulders. This would not only provide additional clearance for emergency vehicles using the shoulders, but would also give the emergency responders additional room to establish their work perimeter and the necessary traffic control measures.

Of the two Build Alternates, the Managed Lanes Alternate would offer the most benefit for incident management. First, physical separation of the general purpose and managed lanes would provide adjacent detour routing and/or access for emergency services during traffic related and other incidents. In addition, the managed lanes would provide emergency responders with unimpeded access throughout Section 100, since the managed lanes would operate at LOS D or better. Furthermore, by having a maximum of four contiguous lanes (general purpose) and additional shoulders associated with the managed lanes, additional areas would be available for crews to work and safely access the site.

b. Facility Maintenance

[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]

Heavily traveled Interstate facilities require substantial levels of routine maintenance such as the replacement of pavement markings and overhead lights, cleaning of drainage systems, replacement/repair of guardrail and energy absorption systems, repaving/resurfacing, and upkeep of stormwater management (SWM) facilities. High traffic volumes make almost any maintenance activity a major undertaking. As a result, most maintenance is performed off-peak, quite often at night.

Of the two Build Alternates, the Managed Lanes Alternate would offer the least obstacles to facility maintenance. Most work could be done off-peak by diverting traffic to either the managed lane roadway or to the general purpose roadway. There would be minimal effort and materials required to redirect the traffic, and worker safety would be enhanced by the concrete barrier that would separate them from the traffic.

c. Enforcement

[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]

4. Fiscal Responsibility

a. Operational Cost

The term No-Build is often misleading. It does not mean that there would be no cost associated with this alternate. Rather, it means that no funds would be expended to increase the capacity of the roadway. There would still remain significant costs associated with maintaining the facility. This would include activities such as roadway resurfacing, bridge replacement, signing, lighting, pavement markings, etc. However, these costs were not calculated for the purposes of this comparison.

The General Purpose Lanes Alternate preliminary cost estimate is approximately $452,026,668, while the Managed Lanes Alternate preliminary cost estimate is approximately $821,635,146. These preliminary costs do not include right-of-way, mitigation and aesthetic enhancement costs. *[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]*

5. Regulatory Compliance

[This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.]

The Section 100 Alternates have been developed in compliance with the National Environmental Policy Act (NEPA) as well as several other applicable state and federal regulations including, but not limited to, the Endangered Species Act (ESA) Section 7, Section 4(f), Section 404, Executive Order 12898 Environmental Justice, Conformity/Planning, and Section 106.

III. AFFECTED ENVIRONMENT

A. Social Environment

A socio-economic inventory was conducted as part of the Section 100 study. This inventory involved the identification of communities, community facilities, and commercial and industrial facilities within the study area.

In addition, data regarding population, ethnicity, economics, and other demographics, which were available through the United States Census Bureau's *Census 2000*, were compiled and evaluated. Data were collected at the Census Tract level. The Census Tracts that encompass the study area are depicted on ***Figure III-1***.

1. Population and Housing

Population statistics for the State of Maryland, Baltimore County, Baltimore City, and the Section 100 study area are shown in ***Table III-1***. The population of the study area has characteristics most similar to those of Baltimore County. The number of males and females in the study area, as well as the State, Baltimore County, and Baltimore City, is relatively evenly distributed. Approximately 13 percent of the population in the study area is over age 65. Like the County and the State, the study area's population is comprised mostly of persons classified as White (73 percent) or African American (22 percent). Additional details regarding population and housing can be found in the *Section 100: I-95, I-895(N) Split North of MD 43 Socioeconomic Technical Report* (Authority, 2004) prepared for this project.

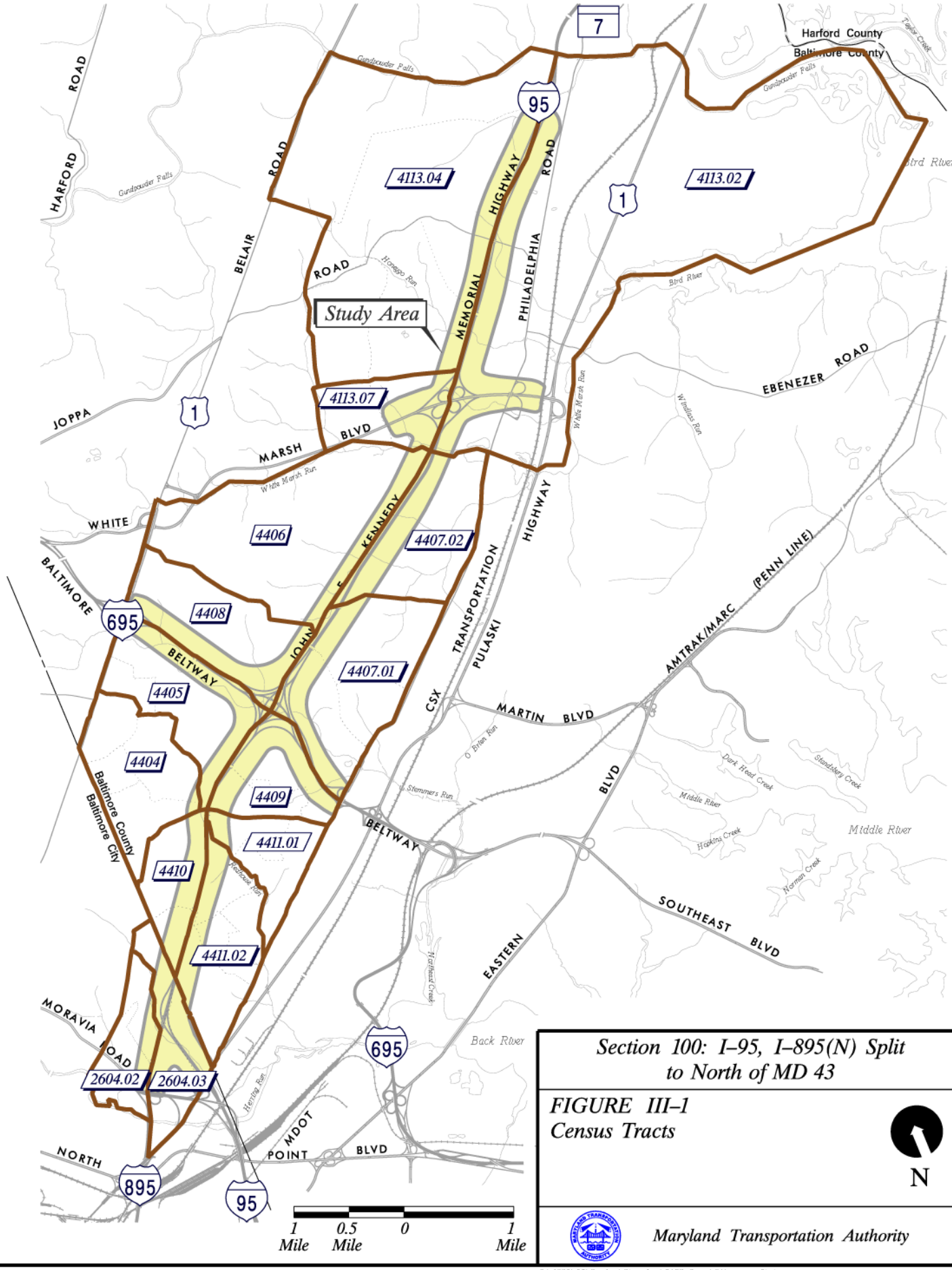
Table III-1. Population Characteristics

Characteristic		Maryland	Baltimore County	Baltimore City	Study Area
Total Population		5,296,486	754,292	651,154	51,166
Projected Population for the Year 2020[1]		6,122,925	795,200	661,100	N/A
% Male/% Female		48%/52%	47%/53%	45%/55%	48%/52%
% Population 65 Years and Older		11%	14.6%	13.2%	13.1%
Racial Distribution	White	64%	74%	31%	73%
	African-American	28%	19%	64%	22%
	American Indian/Alaskan Native	<1%	<1%	<1%	<1%
	Asian/Pacific Islander	4%	3%	2%	3%
	Other	2%	<1%	1%	1%
	Two or More Races	2%	1%	1%	1%
% Population of Hispanic Origin[2]		4%	2%	2%	2%

Source: Census 2000

[1] Population projections provided by the Maryland Department of Planning State Data Center, October 2002

[2] Population of Hispanic Origin can be of any race.



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

FIGURE III–1
Census Tracts

Maryland Transportation Authority

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2. Communities Within the Study Area

Communities located in the vicinity of the Section 100 study area were identified during the field investigations conducted for this project (***Table III-2***). A total of 47 communities are distributed throughout the Section 100 study area. These communities consist of various types of residences including apartments, condominiums, townhomes, and single-family homes. The locations of the communities and their counterparts are depicted on ***Figure III-2***. The number of existing units within the townhome, apartment, and condominium communities was obtained through coordination with property managers and community associations. However, this information was not readily available for all of the communities.

3. Environmental Justice and Title VI of the Civil Rights Act

Executive Order (EO) No. 12898 of 1994: *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, requires that federal agencies be responsible for reviewing their programs and other activities to identify and address any disproportionately high and adverse effects on the human environments in low-income or minority communities. EO 12898 is implemented through several different regulations including the environmental justice orders of the United States Department of Transportation (USDOT) and the Federal Highway Administration (FHWA). The USDOT strategy ensures that the provisions of EO 12898 are integrated into the relevant existing guidelines used in the project planning and public participation processes. FHWA's order requires that specific research and related data collection be conducted to provide information on environmental justice concerns.

Title VI of the Civil Rights Act of 1964 was developed to protect persons from being discriminated against based on their race, color, or national origin by a federally financed program or activity. Title VI extends to prohibiting a federally financed project or program from use of land that intentionally or non-intentionally discriminates against a person based on race, color, or national origin.

To comply with EO 12898 and related Federal statutes, regulations and guidelines, any readily identifiable group of low-income or minority persons living within the geographic vicinity of the project alternates was inventoried. Identification of low-income and minority populations was based on existing census demographics, field research, and written correspondence with local planning officials (***Appendix C***).

Table III-2. Residential Communities in the Vicinity of the Study Area

Community	Address	Housing Type	# of Units[1]
Amberly of Kings Court	King Avenue	Townhomes	Not Available
Batter Brook[2]	Rossville Boulevard	Single Family	Not Applicable
Bayhill	Burnham Woods Court	Townhomes	Not Available
Berry Hill	Featherhill Road	Townhomes	Not Available
Bluegrass Heights	Bluegrass Road	Single Family	Not Applicable
Brantwood at White Marsh	*Stillwood Circle*	Townhomes	Not Available
Cambridge Court	Franklin Square Drive	Apartments	544
Castle Creek	Franklin Square Drive	Townhomes	Not Available
Castle Stone	Spotswood Road	Single Family	Not Applicable
Cedar Lane Farms	Rossville Boulevard	Single Family	Not Applicable
Chesaco Heights	Hamilton Avenue	Single Family	Not Applicable
Darryl Gardens	Carrington Drive	Single Family	Not Applicable
Daybreak Estates	Twilight Court	Townhomes	Not Available
Devonshire	Franklin Square Drive	Condominiums	Not Available
Equestrian Acres	Philadelphia Road	Single Family	Not Applicable
Fields of White Marsh[2]	Cowenton Avenue	Single Family	Not Applicable
Fontana Village	Orion Court	Townhomes	356
Forge Acres	Winkler Street	Single Family	Not Applicable
Forge Heights	Bangert Drive	Single Family	Not Applicable
Forge Landing	East Joppa Road	Single Family	147
Garden Village	St. Regis Road	Townhomes	764 – Apts.; 641 - Townhomes
Glenside Farms	New Gerst Road	Single Family	Not Applicable
Hamiltowne	Hamiltowne Court	Single Family	Not Applicable
Highpoint Addition	Weyburn Court	Single Family	Not Applicable
Hazlewood Village	Wintergreen Place	Townhomes	Not Available
Hillbrook	Neighbors Avenue	Single Family	Not Applicable
Holland Hills	Lelden Road	Townhomes	Not Available
Honeygo Falls[2]	East Joppa Road	Single Family	13
Honeygo Ridge	Philadelphia Road	Single Family	Not Applicable
Honeygo Village Center[2]	Honeygo Boulevard	Townhomes	Not Available
Lawrence Hill	Silver Spring Road	Single Family	Not Applicable
Lennings Crossing[2]	Lennings Lane	Single Family	Not Applicable
Lincoln Woods	Lincolnwood Way	Apartments	204
Moore's Meadow[2]	East Joppa Road	Single Family	62
Moore's Orchard[2]	Joppa Road	Single Family	Not Applicable
Park East	Kelbourne Avenue	Apartments	220
Perry Hall Farms	Forge Road	Single Family	Not Applicable

Table III-2. Residential Communities in the Vicinity of the Study Area

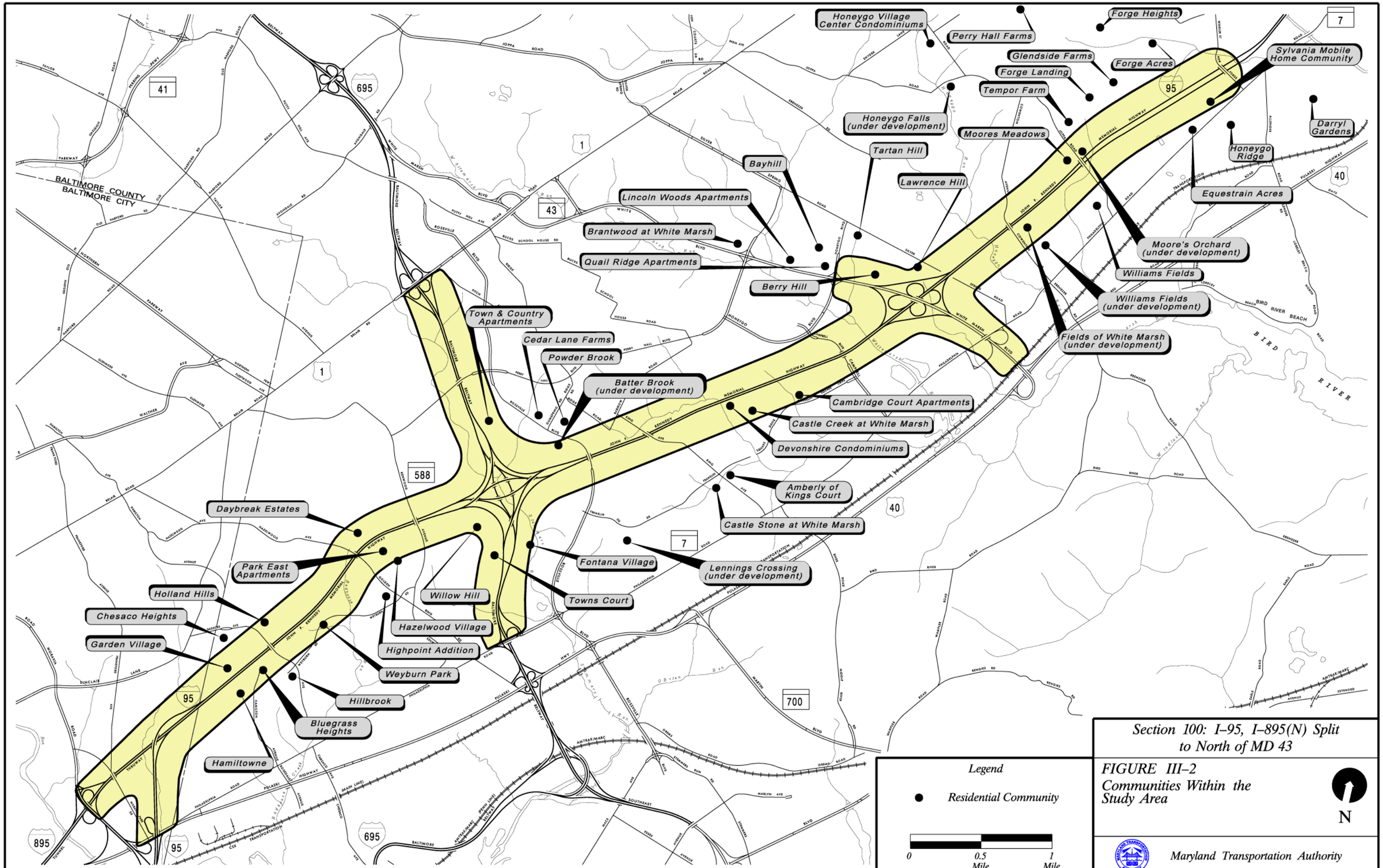
Community	Address	Housing Type	# of Units[1]
Powder Brook	Rossville Boulevard	Single Family	Not Applicable
Quail Ridge	Titagel Court	Apartments	192
Sylvania Mobile Home	Philadelphia Road	Mobile Homes	Not Available
Tartan Hill	Silver Spring Road	Single Family	Not Applicable
Tempor Farm	Forge Haven Drive	Single Family	Not Applicable
Towns Court	Towns Court	Townhomes	Not Available
Town and Country	Gum Spring Road	Apartments	600 +
Weyburn Park	Weyburn Road	Single Family	Not Applicable
Williams Fields[2]	Cowenton Avenue	Single Family	Not Applicable
Willow Hill	Tarpley's Circle	Single Family	Not Applicable

[1] Information is provided only if it was available and applicable.
[2] Residential communities currently being developed

a. Low-Income Populations

Information obtained from the Baltimore County government's website (2003) indicated that *Fontana Village* and *Garden Village* are two low-moderate income communities within the study area. As referenced in ***Table III-2***, Fontana Village has 356 townhome units and Garden Village has 764 apartment units and 641 townhome units. The Public Health and Welfare, 42 U.S.C., (Chapter 69 §5302), provides definitions of low and moderate income persons. A person of low income has a household income that does not exceed 50 percent of the median income of the area involved. Moderate income refers to those persons whose household incomes do not exceed 80 percent of the median income of the area involved.

The Department of Health and Human Services (DHHS) categorizes low-income as a household having an income at or below the DHHS poverty guidelines. DHHS poverty guidelines vary from year to year based on results of the United States Census Bureau poverty thresholds. The DHHS poverty threshold for 2000 is $14,150 for a three-person family unit. Census 2000 data reports that the median household income for the study area is $49,109, which is well over the DHHS poverty threshold. Baltimore County and City, in comparison, have median household incomes of $50,667 and $30,078, respectively. The study area median household income is slightly below the county median, but well above the DHHS poverty thresholds. In addition, all Census Tracts within the study area have a median household income that is well above the DHHS poverty threshold.



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

FIGURE III–2
Communities Within the Study Area

N

Legend

● *Residential Community*

0 0.5 Mile 1 Mile

Maryland Transportation Authority

Source: ADC Mapping (2002) – Supplemental Field Inventory

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b. Minority Populations

The Executive Order 12898 defines minority persons as:

- Black (a person having origins in any of the black racial groups of Africa);
- Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture origin, regardless of race);
- Asian American (a person having origins in any of the original peoples of the Far East, South East Asia, the Indian subcontinent, or the Pacific Islands);
- American Indian and Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition).

The racial distribution in 2000, as identified in ***Table III-1***, reveals that 73 percent of the population in the study area is classified as White, and that approximately 27 percent of the population within the study area is classified as minority.

According to Census 2000 and correspondence with the Department of Planning for Baltimore City (***Appendix C***), four Census Tracts within the study area show a substantially higher presence of minority populations. Among these four Census Tracts, approximately 95 percent of the population for combined Census Tracts 2604.02 and 2604.03 is minority. Census 2000 data revealed that the population of census tract 4410, bordered by Philadelphia Road, I-95 and Redhouse Run, is 63 percent minority. Similarly, tract 4407.01, which encompasses sections of the I-95/I-695 Interchange and King Avenue, has a 44 percent minority population. (***Figure III-1***).

As evidenced by the correspondence in ***Appendix C***, the Baltimore County Office of Planning also identified two specific populations within the study area that have a presence of low-income/minority communities. The first area identified is located along Gilley Terrace, between Gum Spring Road and Rossville Boulevard. The other low-income/minority population identified by the Baltimore County Office of Planning is located along Lloyd Avenue. Lloyd Avenue is located just south of New Forge Road, which is the northeastern-most point of the study area. Based on readily available existing census data, both of these communities have been identified as minority communities. Impacts to these communities will be evaluated in compliance with the environmental justice executive order to ensure that impacts are not disproportionately high and adverse.

4. Community Facilities and Services

Community facilities and services located within or serving the study area include: schools; places of worship; cemeteries; parks and recreational areas; healthcare facilities; post offices; libraries; police, fire, and rescue services; and transportation facilities. ***Figure III-3*** shows the locations of the community facilities within and near the study area.

a. Schools

Ten schools are located within or near the Section 100 study area. Seven of these are elementary schools, one is a middle school, one is a high school, and one is a community college. Public schools within the study area include:

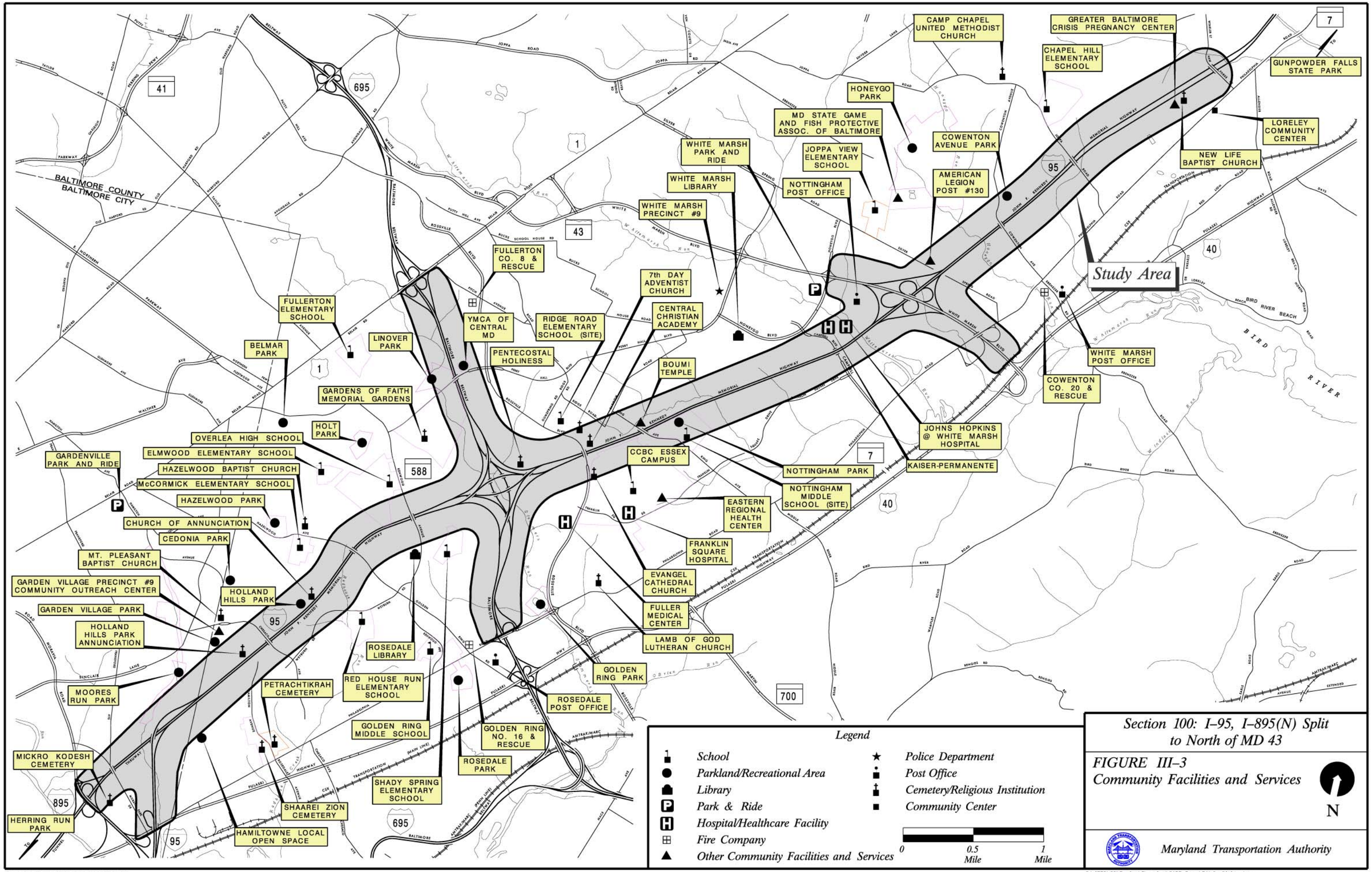
- Red House Run Elementary School
- McCormick Elementary School
- Elmwood Elementary School
- Shady Spring Elementary School
- Chapel Hill Elementary School
- Joppa View Elementary School
- Fullerton Elementary School
- Golden Ring Middle School
- Overlea High School
- Community College of Baltimore County Essex Campus

Two future school sites are also located in the vicinity of the Section 100 study area, including the Ridge Road Elementary School site and the Nottingham Middle School site (***Figure III-3***).

b. Places of Worship

The following places of worship are located within or near the study area:

- Camp Chapel United Methodist Church
- New Life Baptist Church
- Hazelwood Baptist Church
- 7th Day Adventist Church
- Central Christian Academy
- Lamb of God Lutheran Church
- Mount Pleasant Baptist Church
- Church of Annunciation
- Pentecostal Holiness Church
- Holland Hills Park Annunciation



Legend

- School
- Parkland/Recreational Area
- Library
- Park & Ride
- Hospital/Healthcare Facility
- Fire Company
- Other Community Facilities and Services
- Police Department
- Post Office
- Cemetery/Religious Institution
- Community Center

0 0.5 Mile 1 Mile

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

FIGURE III–3
Community Facilities and Services

N

Maryland Transportation Authority

Source: ADC Mapping (2002) – Supplemental Field Inventory

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c. Cemeteries

The following cemeteries are located to the south of I-695, in the vicinity of the Section 100 study area:

- Gardens of Faith Memorial Garden
- Mickro Kodesh Cemetery
- Petrachtikvah Cemetery
- Shaarei Zion Cemetery

d. Parks and Recreational Facilities

Sixteen public parks and recreational facilities are located within or near the study area. Many of these facilities are local playgrounds. However, there are several large parks also serving the study area. The largest park in the vicinity of the study area is Gunpowder Falls State Park, a facility located north and northeast of the northern study area limit and serving the entire region. This park is approximately 18,000 acres in size and provides a multitude of recreational opportunities including bicycling, boating, cross-country skiing, fishing, hiking, hunting, picnicking, and swimming. Honeygo Park is another large facility serving the study area. This park is approximately 206 acres in size and provides ball fields, playground equipment, a sand volleyball court, picnic areas, pavilions, and walking paths. ***Table III-3*** describes the amenities, size, and jurisdiction of each park or recreational facility.

e. Healthcare Facilities

Franklin Square Hospital/Eastern Regional Health Center is the closest hospital to the study area. Other medical facilities within (or near) the study area include Kaiser Permanente, Johns Hopkins at White Marsh, and the Fuller Medical Center.

f. Post Offices

Three post offices serve the study area. The White Marsh Post Office is located in the northern end of the study area, east of I-95. The Nottingham Post Office is also located in the northern half of the study area, west of I-95. The Rosedale Post Office is located in the southern portion of the study area, east of I-95.

g. Libraries

Two public libraries are located in the vicinity of the study area. The White Marsh Library is located in the central portion of the Section 100 study area, on Honeygo Boulevard. The Rosedale Library is located in the southern portion of the study area, on Kenwood Avenue. Both of these facilities are branches of the Baltimore County Public Library system.

Table III-3. Public Parks/Recreational Areas Within the Study Area

Name of Park	Amenities	Size (Acres)	Jurisdiction
Gunpowder Falls State Park	Biking trails, boat launch, boat rentals, cross-country skiing, interpretive programs, food and beverages, fishing, flatwater canoeing, hiking trails, historic interest, hunting, picnicking, playgrounds, equestrian trails, picnic shelters, swimming, whitewater canoeing, boardsailing lessons and equipment rental	18,000	State of Maryland
Cowenton Avenue Park	Undeveloped	25.0	Baltimore County
Honeygo Park	Ball fields, playground, sand volleyball court, picnic area, pavilion, walking path	206.0	Baltimore County
Nottingham Park	Ball fields, athletic fields	35.3	Baltimore County
Golden Ring Park	Playground, fishing, restrooms, trails	13.5	Baltimore County
Linover Park	Picnic area, playground, restrooms, athletic fields	13.8	Baltimore County
Rosedale Park	Pavilions, picnic area, playground, ball fields, restrooms	19.8	Baltimore County
Holt Park	Parkland area, nature trails	13.2	Baltimore County
Holland Hills Park	Playground	6.5	Baltimore County
Belmar Park	Playground, ball field, restrooms	7.1	Baltimore County
Hazelwood Park	Undeveloped	7.0	Baltimore County
Cedonia Park	Parkland area	2.5	Baltimore County
Hamiltowne Local Open Space	Picnic pavilion, picnic tables, playground equipment/tot lot equipment	1.7	Baltimore County
Garden Village Park	Pavilion, picnic areas, playground, multi-purpose court	5.5	Baltimore County
Moores Run Park	Informal paths	35.0	Baltimore City
Herring Run Park	Recreational center, playground, ball fields, trails, tennis courts, picnic area, fishing, basketball courts	72.0	Baltimore City
Source: Maryland Department of Planning Baltimore County Department of Planning			

h. Police, Fire, and Rescue Services

The White Marsh Precinct #9 is located in the central portion of the study area, on Perry Hall Boulevard. Three fire and rescue companies are also located in the vicinity of the study area. Golden Ring Company 16 is located in the southeastern portion of the study area, on Golden Ring Road. Fullerton Company 8 is located in the central portion of the study area, to the west of I-95 on Rossville Boulevard. Cowenton Company 20 is located in the northern portion of the study area, on Ebenezer Road.

i. Transportation Facilities

The White Marsh Park-and-Ride and the Gardenville Park-and-Ride are located near the Section 100 study area. The White Marsh Park-and-Ride is a 409-space lot owned by the Maryland Transit Administration (MTA). It is located on Honeygo Boulevard, near the White Marsh Mall. The Gardenville Park-and-Ride is also owned by the MTA and has 88 spaces available. This facility is located in the southern portion of the study area, on US 1 (Belair Road).

j. Other Community Facilities and Services

Several other miscellaneous community facilities exist within the vicinity of the Section 100 study area, including:

- Maryland State Game and Fish Protective Association of Baltimore
- YMCA of Central Maryland
- Greater Baltimore Crisis Pregnancy Center
- Garden Village Precinct - Community Outreach Center
- Boumi Temple
- American Legion Post #130
- Eastern Regional Health Center
- Loreley Community Center

5. Visual Quality

The aesthetics along I-95 Section 100 vary greatly between remnant forested areas, residential areas, and commercial areas. Visual characteristics vary because of the different land use and development types along this section of I-95, which range from urban to undeveloped. (Additional details regarding land use are provided in Section III-C.)

The land use at the southern end of the study area, from the I-95/I-895(N) split to the Hazelwood Avenue overpass, is primarily residential. The roadsides in these areas are lined with sound barriers, which help attenuate highway noise for nearby residents, and help to visually buffer nearby residents from views of the highway.

The I-95 highway roadsides north of Hazelwood Avenue become more naturalized, lacking sound barriers that would limit views. The area from the I-695 Interchange to the King Avenue underpass consists of remnant forests within an urban/suburban setting. Larger remnant forest tracts are preserved inside the interchange gores and along the highway roadsides. Several buildings can be seen from the highway through gaps in the forest; however, these buildings are not highly visible.

The I-95 study area becomes more urban between King Avenue and the MD 43 Interchange. There are no sound barriers and very limited vegetation, so the views are wide and open to the surrounding development. Several major shopping centers and multi-story buildings abut the highway, and are highly visible by the highway users. The highway is also visible from the surrounding developments.

The highway roadsides through the MD 43 Interchange and north to the study limit at the Baltimore County Urban-Rural Demarcation Line (URDL) consists of remnant forest areas, interspersed with a several new suburban developments. This portion of Section 100 does not have sound barriers, so the viewshed is mostly open to the remnant forest areas and suburban development. Most of the adjacent development is medium or low density, and is not highly visible along the roadsides.

B. Economic Environment

1. Income

Table III-4 shows Census 2000 income data for the State of Maryland, Baltimore County, Baltimore City, and the Section 100 study area. Baltimore City showed the lowest median household and median family income levels. Within the study area, the median household and median family income ($49,102 and $55,737, respectively) were slightly less than in Baltimore County, but still higher than in Baltimore City.

Per capita income, which describes the average income per person, for the study area falls below that of the State and the County, but at $22,379, is still higher than that of Baltimore City ($16,978). Additional details can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Socioeconomic Technical Report* prepared for this project.

Table III-4. Income Characteristics

Characteristic	Maryland	Baltimore County	Baltimore City	Study Area
Median Household Income (1999)[1]	$52,868	$50,667	$30,078	$49,109[2]
Median Family Income (1999)[1]	$61,876	$59,998	$35,438	$55,737[2]
Per Capita Income	$25,614	$26,167	$16,978	$22,379

Source: Census 2000

[1] A household is defined by the U.S. Census Bureau as a place (structure) where one or more persons reside on a regular basis. A family is defined as two or more persons related by birth, marriage, or legal adoption that occupy a place (structure) on a regular basis.

[2] Figures shown were determined by calculating the average of the Median Household Income or Median Family Income values for each Census Tract in the study area.

2. Employment

a. Employment Characteristics

The top industries in Baltimore City and Baltimore County include:

- Educational, health, and social services
- Professional, scientific, management, administrative, and waste management services
- Retail trade
- Public administration
- Finance, insurance, real estate, and rental and leasing.

As shown in ***Table III-5***, the majority of employed County, City, and study area residents have occupations that fall into the Management, Sales/Office, or Government categories. ***Table III-5*** also shows that Baltimore City's unemployment rate of 10.7 percent is more than twice that of both Baltimore County (4.2 percent) and the study area (3.8 percent).

Table III-5. Occupational Characteristics

Characteristic	Baltimore County	Baltimore City	Study Area
Primary Occupations of Residents	Management – 40% Sales/Office – 29% Government – 18%	Management – 32% Sales/Office – 27% Government – 22%	Sales/Office - 31% Management - 29% Government - 18%
Percent of Labor Force Unemployed	4.2%	10.7%	3.8%

Source: Census 2000

The Section 100 study area traverses the Rosedale, Rossville, Overlea, and White Marsh Census Designated Places (CDPs) (***Figure III-4***). A CDP is defined by the U.S. Census Bureau as "a geographic entity that serves as the statistical counterpart of an incorporated place for the purpose of presenting Census data for an area with a concentration of population, housing, and commercial structures that is identifiable by name, but is not within an incorporated place."

Approximately 60 and 65 percent of the population 16 years and older in Rosedale and Overlea, respectively, are employed, while 73 percent of the residents in both Rossville and White Marsh are employed. The mean travel time to work for residents within the CDPs is approximately 25 to 30 minutes, which is similar to that of Baltimore County (28 minutes) and Baltimore City (31 minutes). The majority of workers within the CDPs drive to work alone (74 to 88 percent), while a much smaller percentage (8 to 12 percent) carpool. Public transportation and walking are not common, representing only about four percent (maximum) and one percent of the working population, respectively. A comparison of the employment characteristics for Baltimore County, Baltimore City, and the study area is provided in ***Table III-6***. Additional information regarding employment characteristics can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Socioeconomic Technical Report* prepared for this project.

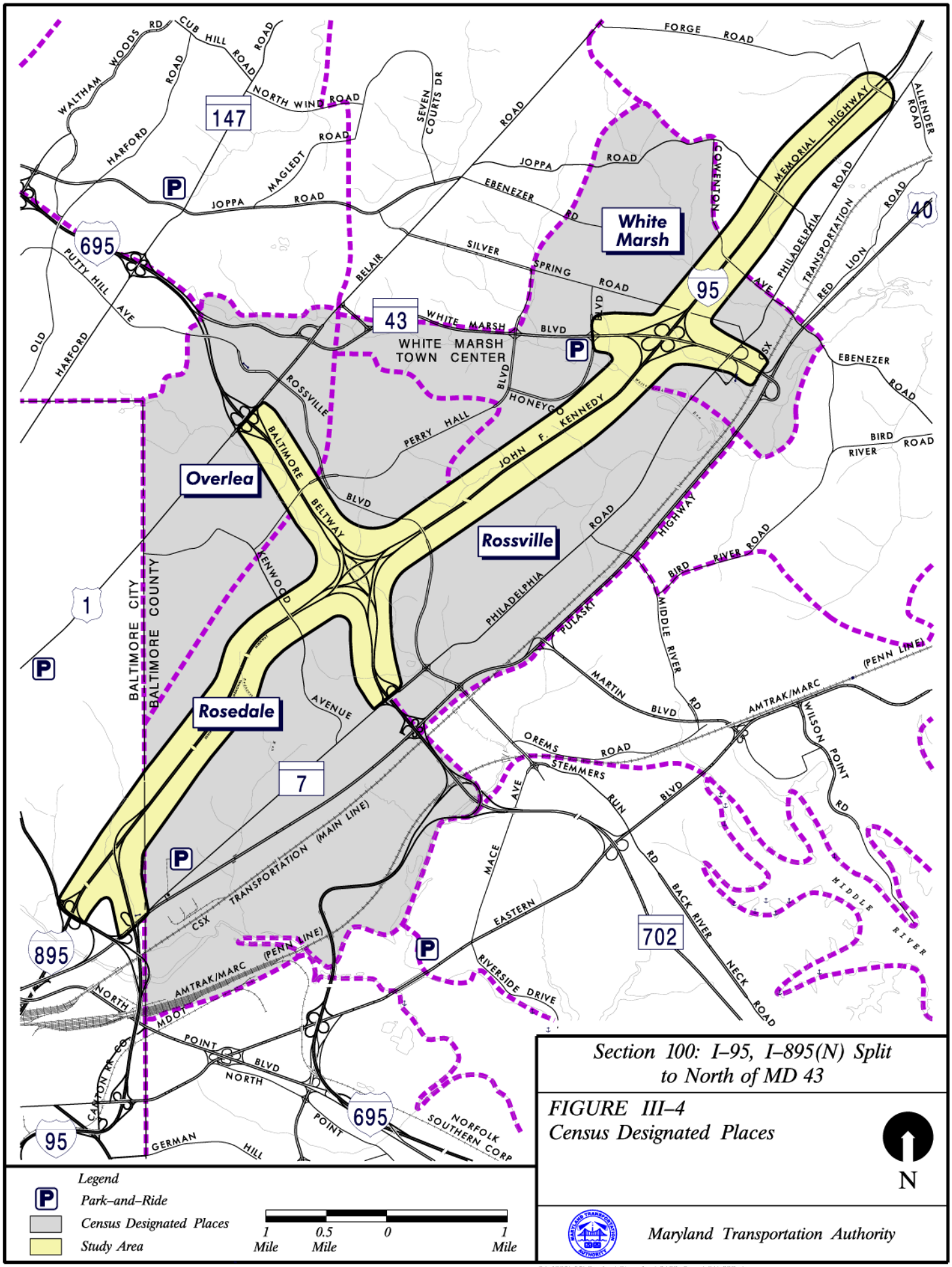
b. Commercial and Industrial Facilities

Major employers and business areas within the study area are identified on ***Figure III-5***. Primary industrial centers include the Rosedale Industrial Park, Rossville Industrial Park, Pulaski Industrial Park, and East Business Industrial Park. Large business areas include healthcare facilities such as Franklin Square Hospital, Johns Hopkins at White Marsh Hospital, and Kaiser-Permanente Hospital, and business centers such as the White Marsh Business Community. In addition, there are a large number of schools and retail areas that support the business economy of the area.

C. Land Use in the Study Area

1. Existing Land Use

The Section 100 study area is dominated by residential land use 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 land use, with some sparsely scattered areas of open space and industrial land use. The following is a summary of the land use types and their general locations, as depicted on ***Figure III-6***. Additional details regarding land use can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Socioeconomic Technical Report* prepared for this project.



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

FIGURE III–4
Census Designated Places

Maryland Transportation Authority

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Table III-6. Summary of Employment Characteristics

	Baltimore County	Baltimore City	Study Area*
Population 16 years and Older Employed	67 %	50%	60-73%
Mean Travel Time To Work	28 min.	31 min.	25-30 min.
% Population Drives Alone to Work	80%	55%	74-88%
% Population Takes Public Transportation to Work	4%	20%	4%
% Population Carpools To Work	11%	15%	8-12%
% Population Walks To Work	2%	7%	1%
* Range depicts differences in CDPs within the study area			

2. Future Land Use

The Section 100 study area begins in Baltimore City and heads north into Baltimore County. According to the *Baltimore City Economic Growth Strategy*, future development in the study area within Baltimore City consists mainly of re-urbanization and renewal of blighted neighborhoods. Therefore, future land use would remain similar to existing land use.

The Baltimore County's *Master Plan 2010* (Baltimore County Council, 2000) incorporates the designation of two land management areas – the urban area and the rural area. The boundary separating these two land management areas is called the Urban Rural Demarcation Line (URDL) (***Figure I-2***). The urban areas have public water and sewer infrastructure, thereby accommodating development such as employment, retail, and residential uses. The rural areas rely on private wells and septic systems, which limit development and encourage maintenance of the agricultural and low-density residential uses. Growth management, land use policies, and proposed roadway improvements within the *Master Plan 2010* are designed to focus growth within the URDL.

BALTIMORE COUNTY
BALTIMORE CITY

WHITE MARSH MALL
SHOPPING CENTER
THE AVENUE
WHITE MARSH BUSINESS COMMUNITY
METRIS COMPANIES
NOTTINGHAM SQUARE
CCBC ESSEX CAMPUS
EASTERN REGIONAL HEALTH CENTER
WHITE MARSH BUSINESS COMMUNITY
FRANKLIN SQUARE HOSPITAL
EAST BUSINESS INDUSTRIAL PARK
ROSSVILLE INDUSTRIAL PARK
PULASKI INDUSTRIAL PARK
CEDONIA SHOPPING CENTER
KENWOOD SHOPPING CENTER
ROSEDALE SHOPPING CENTER
FRANKFORD PLAZA
GOLDEN RING PLAZA
ROSEDALE INDUSTRIAL PARK

BIRD RIVER BEACH
BIRD RIVER

Legend

H *Hospital*

0 0.5 Mile 1 Mile

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

FIGURE III–5
Business Areas and Major Employers

N

Maryland Transportation Authority

Source: ADC Mapping (2002) – Supplemental Field Inventory

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Legend

- Residential
- Commercial
- Industrial
- Recreational Land
- Open Space
- Forested
- Cemetery
- Institutional
- Agricultural
- Transportation

Study Area

BELAIR ROAD
BALTIMORE BELTWAY
HAZELWOOD AVE
KENWOOD AVENUE
BALTIMORE CITY
BALTIMORE COUNTY
SINCLAIR LANE
MORAVIA ROAD
CHESACO AVE
JOHN F. KENNEDY MEMORIAL HIGHWAY
WEYBURN RD
HAMILTON AVENUE
Redhouse Run
GOLDEN RING RD
KENWOOD AVE
ROSSVILLE BLVD
FERRY HALL BLVD
GUMSPRING RD
RIDGE ROAD
BABIKOW RD
RING RD
FRANKLIN SQ DR
Stemmers Run
PHILADELPHIA ROAD
PULASKI HIGHWAY
ROSEDALE AVENUE
Redhouse Creek
CSX TRANSPORTATION (MAIN LINE)
MORAVIA PARK DR
895
95
695
7
40
1

Match Line See Sheet 2 of 2

0 0.25 Mile 0.5 Mile

N

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

FIGURE III–6
Existing Land Use

Sheet 1 of 2

Maryland Transportation Authority

Source: Anderson Land Use (1986)
Supplemented by Field Inventory

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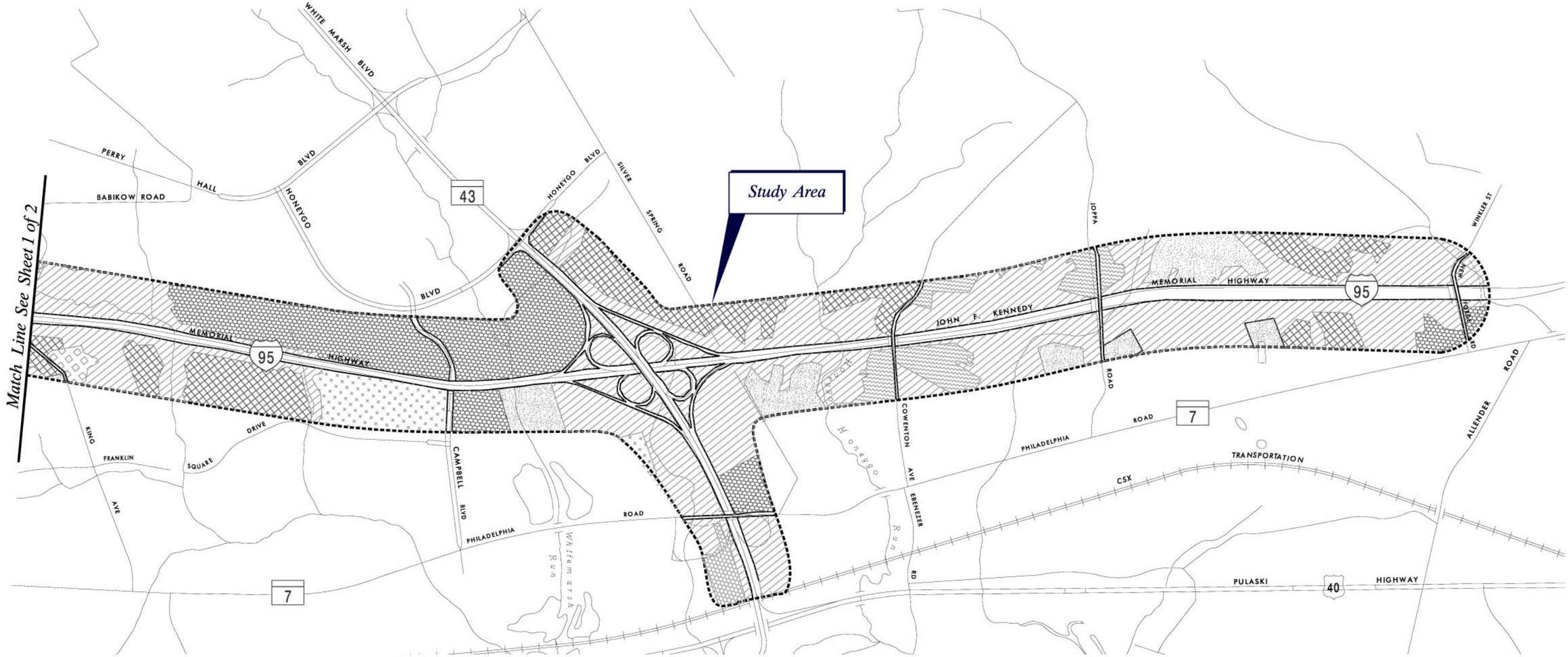
Legend

- *Residential*
- *Commercial*
- *Industrial*
- *Recreational Land*
- *Open Space*
- *Forested*
- *Cemetery*
- *Institutional*
- *Agricultural*
- *Transportation*



0 0.25 Mile 0.5 Mile

N

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

FIGURE III–6
Existing Land Use

Sheet 2 of 2

Maryland Transportation Authority

Source: Anderson Land Use (1986)
Supplemented by Field Inventory

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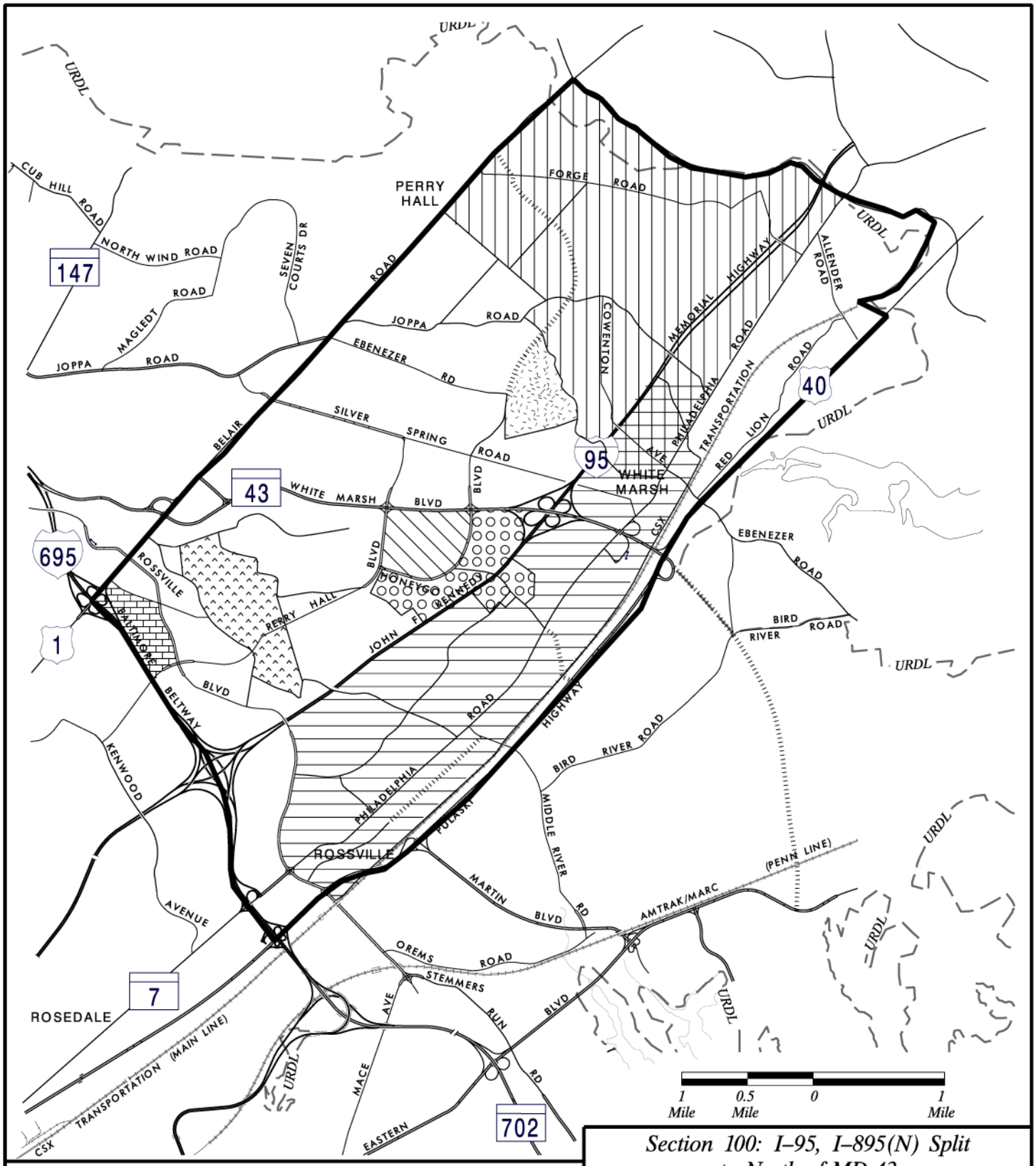
The URDL also serves as the boundary of the Baltimore County-designated and State-certified Priority Funding Area (PFA). PFAs are existing communities and other locally designated areas as determined by local jurisdictions in accordance with Maryland's Smart Growth Priority Funding Areas Act of 1997. Baltimore County's PFA was established in accordance with the guidelines set forth in this legislation, whose initiatives formally took effect on October 1, 1998. The intent of the Smart Growth Priority Funding Areas Act is to direct State funding for growth-related projects to PFAs. The Section 100 study area is located entirely within the State-certified PFA and is, therefore, consistent with the Smart Growth initiatives.

Another feature of the *Master Plan 2010* is the designation of "growth areas" within Baltimore County. One of these designated growth areas is the Perry Hall – White Marsh Growth Area. This growth area is designed to provide a self-sustaining, planned community, including housing, employment, and full commercial and public service.

The Perry Hall – White Marsh Growth Area encompasses approximately half of the study area, and is about 18.8 square miles in size (***Figure III-7***). The center of the growth area is located at White Marsh Mall. Three primary sections within the growth area are designated for business development, including the White Marsh Business Community, the Philadelphia Road Corridor, and the proposed Fitch Avenue Industrial Area. Based on existing plans, the White Marsh Business Community, which is currently a commercial area, would maintain its current use by providing mixed office and light industrial development. The Philadelphia Road Corridor would provide industrial and other types of development, transforming an area of primarily residential use to industrial use.

The Fitch Avenue Industrial Area provides an industrial district within the Growth Area. This area currently consists of a mix of industrial, commercial, and residential uses. By designating the area as an Industrial Area, additional development will be focused on expanding the industrial and commercial land use that currently exist there. Finally, an area known as Honeygo, located just north of the White Marsh Business Community, is planned for residential land use associated with the growth area businesses. New development is rapidly occurring in this area. ***Figure III-7*** provides a summary of the proposed land use subdivisions within the Perry Hall – White Marsh Growth Area. Overall, the Perry Hall – White Marsh Growth Area would focus commercial and industrial growth in areas that already contain such uses, expanding them slightly in more urban areas.



Legend

- *Road Network*
- *Proposed Road Project*
- *URDL*
- *Perry Hall/White Marsh Growth Area*
- *Fitch Ave. Industrial Area*
- *Honeygo Park*
- *Fullerton Reservoir Site*
- *White Marsh Town Center*
- *Philadelphia Road Corridor*
- *White Marsh Business Community*
- *Honeygo*

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

FIGURE III–7
Perry Hall – White Marsh Growth Area

N

Maryland Transportation Authority

Data Sources:
URDL, Land Management Areas:
Baltimore County Office of Planning (1:24000)
Roads: Baltimore Metropolitan Council (1:24000)

Data Sources:
Baltimore County Office of Planning
OIT – GIS Services Unit

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To assist in the development of the Perry Hall – White Marsh Growth Area, several roadways are proposed for improvements, including:

- Realigning Ebenezer Road to Cowenton Avenue,
- Widening the Baltimore Beltway from I-83 to I-95,
- Constructing Honeygo Boulevard from Ebenezer Road to Belair Road,
- Constructing Campbell Boulevard from Philadelphia Road to Pulaski Highway,
- Widening Philadelphia Road from Campbell Boulevard to Cowenton Avenue,
- Upgrading White Marsh Road from Bucks School House Road easterly, and
- Widening Perry Hall Boulevard from Rossville Boulevard to Honeygo Boulevard.

Baltimore County has also planned several additional park sites in the Honeygo area. In addition, to further accommodate the development in this area, Baltimore County has acquired land to allow for the construction of several new schools, should it become warranted. These sites include the Nottingham Middle School site and the Ridge Road Elementary School site.

With the advanced planning provided in *Master Plan 2010*, future land uses outside of the Perry Hall – White Marsh Growth Area (as well as growth areas elsewhere in the County) are anticipated to remain relatively unchanged, as development is focused.

D. Cultural Resources

Cultural resources include historic and archaeological properties protected under Section 106 of the National Historic Preservation Act, as amended. Section 106 requires that, prior to approval of a project by a federal agency, the agency involved must consider the project's effects on any district, site, building, structure or object that is included or eligible for inclusion in the National Register of Historic Places (NRHP), and give the Advisory Council on Historic Properties an opportunity to comment with regard to the project. Properties of national, state, or local significance may be determined eligible for the NRHP. Archaeological sites that meet certain criteria may also be included on the NRHP.

Pursuant to Section 106, resources listed or potentially eligible for the NRHP that are within the Area of Potential Effect (APE) of a project must be evaluated for potential effects due to the project. Measures to minimize or mitigate adverse effects must be developed in consultation with the State Historic Preservation Officer (SHPO) and other interested parties and may be memorialized in a Memorandum of Agreement (MOA).

Cultural resource surveys were conducted in accordance with relevant State and Federal regulations, including: the USDOT Act of 1966, as amended; the National Historic Preservation Act of 1966, as amended; 36 Code of Federal Regulations (CFR) Part 800 – Protection of Historic Properties; EO 11593; and the Maryland Historical Trust (MHT) Act of 1985 (Article 83B, §§ 5-607, 5-617 to 5-619, and 5-623 of the Annotated Code of Maryland). All work was conducted in accordance with relevant guidelines from the MHT (viz. Maryland Historical Trust 2000; Shaffer and Cole 1994), as well as relevant Federal guidelines (viz. National Park Service, 1983).

The cultural resource surveys included background research and field surveys to identify historic properties. Background research included a review of previous planning and research studies, a review of existing inventories of historic properties, and an analysis of historic maps and documents. Data repositories consulted included the library of the MHT, the Baltimore County Historical Society, and the Baltimore City Commission for Historical and Architectural Preservation. Field identification efforts included a survey of all standing structures within the APE and various forms of archaeological sub-surface testing.

1. Historic Structures

The historic architectural survey included the identification of all resources more than 50 years of age in the APE, the assessment of the significance of these resources, the completion of appropriate survey forms for these resources, and the evaluation of impacts that the project may have on significant historic resources. Archival and cartographic research was conducted to help determine the age and significance of identified resources.

The historic architecture APE for this project, as concurred upon by the SHPO (***Appendix C, November 26, 2003***), consists of a broad corridor along Section 100, approximately 1,000 feet in width (500 feet on either side of the existing centerline of I-95). The APE expands in the interchange areas to accommodate proposed interchange improvements.

A total of 90 resources more than 50 years old were identified within the APE. Of these, 75 resources were documented on Short Forms for Ineligible Properties and 15 were documented on Determination of Eligibility (DOE) forms (including two neighborhood groupings). Prior to the Section 100 survey, no determinations of eligibility had been conducted for any of the properties within the APE.

The resources evaluated were primarily single-family houses dating from the first half of the twentieth century. Common building types within the study area include modified I-houses, American Foursquares, and bungalows. Minimal-Traditional and Cape-Cod cottages dating from the World-War-II era comprise the majority of resources and are generally grouped together in unplanned suburban neighborhoods. Almost all of these

residences have undergone various degrees of alteration, most commonly the application of siding and the replacement of original windows.

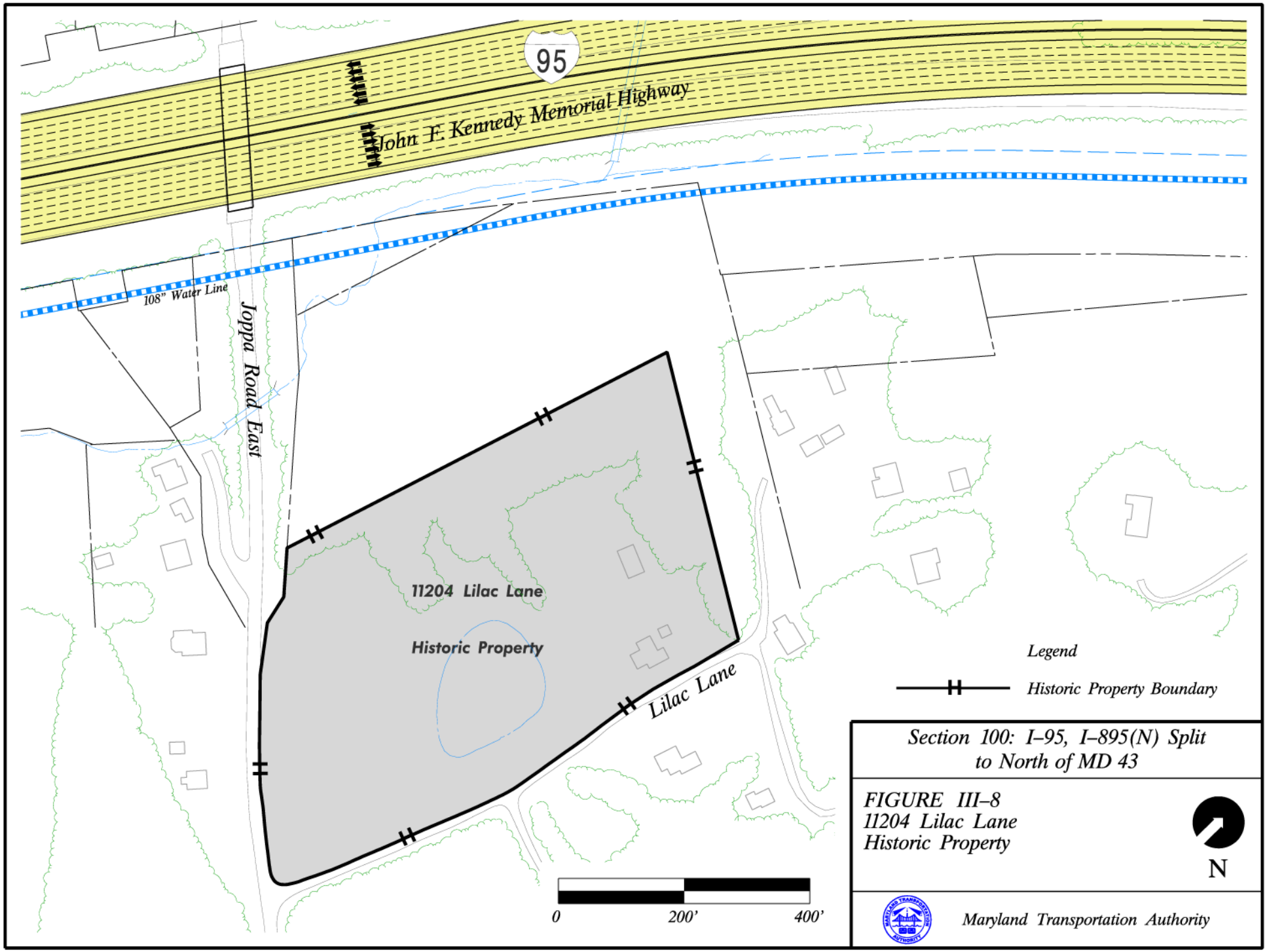
Within the historic structures APE, one property, located at 11204 Lilac Lane (BA-3141), was determined eligible for listing in the NRHP. This property is located in the northeastern quadrant of the Joppa Road/I-95 overpass (***Figure III-8***). Constructed of uncoursed, uncut fieldstone laid with irregular mortar courses, the architecture of 11204 Lilac Lane has its roots in some of the earliest building traditions in northeastern Baltimore County. Although the exact date of construction has not been determined, a review of historic maps indicates a construction date prior to 1850.

The residence at 11204 Lilac Lane is eligible for the NRHP under Criterion C as an example of an early fieldstone house in Baltimore County. Residences such as these were constructed during the late-eighteenth and early-nineteenth centuries. Although the house has two small additions, the property still retains a high degree of integrity. The additions are small in size and do not compromise or obscure the original features of the house. Furthermore, 11204 Lilac Lane still retains much of its site integrity. Although other houses have been constructed in the vicinity, a substantial amount of open space surrounds the residence. Although I-95 has been constructed in reasonably close proximity to the residence, a substantial buffer zone of deciduous trees exists and visually shields the residence from the intrusion.

This resource was identified and documented in the *Section 100: I-95, I-895(N) Split to North of MD 43 Historic Context and Determination of Eligibility and Effects Report* (Authority, 2004) prepared for this project. The SHPO's formal eligibility determination is documented in **Appendix C**. The remaining surveyed resources within the APE were determined not eligible for the NRHP because these buildings fail to meet NRHP criteria due to a lack of historical and architectural significance and a lack of integrity, particularly relating to setting, feeling, and materials. The two neighborhood groupings—35th Street and Kenwood Avenue—lack a cohesive design or plan and developed gradually and arbitrarily over a relatively long period of time.

2. Archaeological Resources

The archaeological APE for this project consists of a narrow corridor of variable width along I-95, which follows the maximum proposed right-of-way for the Build Alternates. An archaeological survey of the APE was completed in January 2004, with the exception of stormwater management (SWM) areas and areas of planned temporary easements such as staging areas. Completion of archaeological testing of these areas will be done during later stages of the project development process, in accordance with the MOA prepared for this project.



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

FIGURE III–8
11204 Lilac Lane
Historic Property

Maryland Transportation Authority

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The MOA was signed by the SHPO and other signatory agencies on XXX, 2004. A copy of the MOA is included in ***Appendix D*** *(MOA has been submitted. Text written as intended for circulation. The MOA must be signed prior to circulation, and a copy will be included in Appendix D when available)*.

One potentially significant archaeological property has been identified within the APE. This property, known as the Smith Site (18BA516), is located in the southwest quadrant of the I-695 Interchange. The site is a precontact era site of unknown age and function, approximately 0.47 acre in size. This resource was identified and documented in the *Section 100: I-95, I-895(N) Split to North of MD 43 Phase I Archaeological Survey* (Authority, 2004) prepared for this project. The SHPO's formal eligibility determination is included in ***Appendix C***. Phase II survey plans for the site, as well as possible mitigation of the site, have been documented in the MOA (***Appendix D***).

Three ineligible archaeological resources were identified in the Section 100 APE, including the Fountain Pen Site (18BC160), Martins Refuse Bottle Dump (18BA514), and the Martin's Farm Site (18BA515). The Fountain Pen Site is an early twentieth-century site containing brick, other architectural debris, and fountain pen fragments. The site does not appear to possess substantial research potential and is not considered a significant resource.

Similarly, Martins Refuse Bottle Dump Site is a bottle dump. The bottles at this site were sampled during the survey and found to date principally to the early-to-mid-twentieth century. This resource type is relatively common in the region and the site is not considered significant.

The Martin's Farm Site is an early-twentieth century site, related to a two-story residence that was demolished as part of the original construction of I-95 in 1963. Historic map analysis of the area suggests that the residence was constructed at some point after 1877. Two possible precontact artifacts were recovered from the Martin's Farm Site. Given that the residence associated with the Martin's Farm Site was demolished as part of the original construction of this portion of I-95, the research potential of the site is limited, and the site is not considered a significant resource.

The Phase I survey further established that previously identified resources within the APE no longer exist, or do not exist where indicated in the site files (MHT/Maryland Archaeological Site Survey). Eight sites (18BA44-51) were recorded in the Section 100 APE, all of which were identified in a survey of I-95 conducted in the early 1960s (Hunt et al. 1964). Recent testing of these site areas yielded no cultural materials related to the sites (some modern roadside debris was recovered). Apparently the sites identified in the earlier survey did not survive the original construction of I-95 in 1963, and/or the subsequent residential and commercial development of the study area.

E. Natural Environment

1. Physiography/Topography and Geology

The study area lies along the fall zone between the Piedmont Plateau Province and the Coastal Plain Province, and consists primarily of nearly level to gently rolling topography. Topography within the study area ranges from 15 feet (at Moores Run under I-95), to approximately 150 feet (at the intersection of Cowenton Avenue and I-95).

Based on the *Geologic Map of Baltimore County, Maryland* (Crowley et al., 1976), geology in the vicinity of the study area originated from the Early Paleozoic – Late Precambrian and Cretaceous periods. Baltimore Gabbro Complex (Early Paleozoic – Late Precambrian period) consists of hypersthene gabbro with subordinate amounts of olivine gabbro, norite, anorthositic gabbro, and pyroxenite. The Baltimore Gabbro Complex deposit exists in the areas at the crossing of Rossville Boulevard and I-95, I-95 and I-695, and New Forge Road and I-95. In all other parts of the study area, geology is from the Cretaceous period, and consists of the Potomac Group, which is interbedded quartzose gravels; protoquartzitic to orthoquartzitic argillaceous sands; and white, dark gray and multicolored silts and clays (Maryland Geologic Survey, 1968).

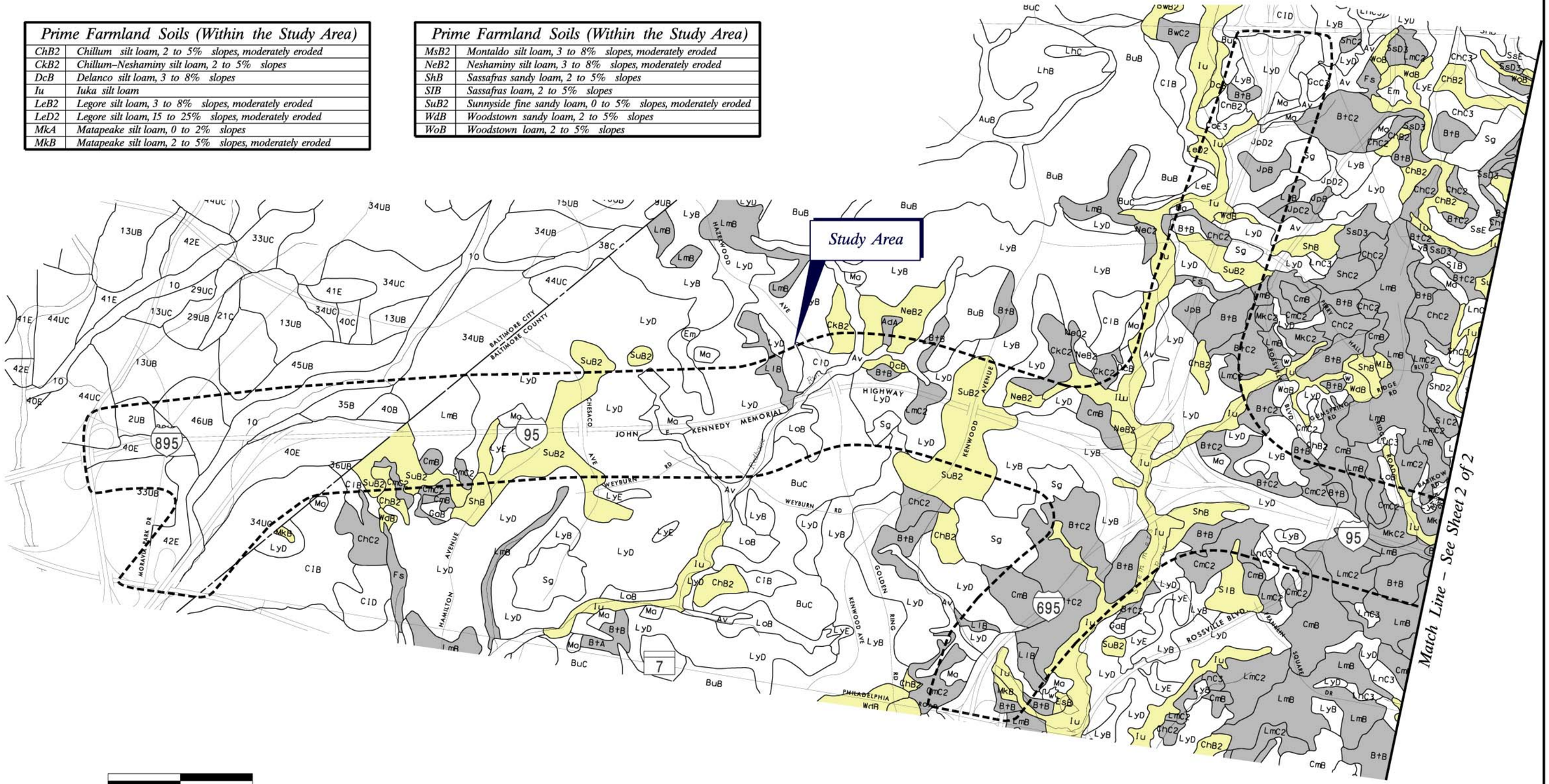
2. Soils

According to the *Soil Survey of Baltimore County, Maryland* (Natural Resources Conservation Service (NRCS), Soil Conservation Service (SCS), 1976), there are 30 soil series and 82 soil mapping units located within the study area. Soil series and other mapping units located within the study area are depicted on ***Figure III-9,*** as are their Prime Farmland Soils/Soils of Statewide Importance designations. Actual soil types throughout the study area may differ from what is shown on the soil survey, as the study area has undergone extensive development/disturbance. Much of the original soils in the area (primarily north of I-695 to MD 43) have been graded, filled, paved, or removed since publication of the soil survey in 1976.

Three soil series (Fallsington, Lenoir, and Leonardtown) are listed on the *Hydric Soils of the United States* (US Department of Agriculture (USDA), NRCS, 1995). Alluvial Land and Fluvents are secondary hydric soils found within the study area (USDA, NRCS, 1995). Secondary hydric soils are specific to localized and/or man-induced conditions which differ from traditional soil taxonomy. The soil units Alluvial Land, Fallsington, and Leonardtown are listed on the *Hydric Soils List of Baltimore County* (USDA NRCS, 2002).

Prime Farmland Soils (Within the Study Area)	
ChB2	Chillum silt loam, 2 to 5% slopes, moderately eroded
CkB2	Chillum–Neshaminy silt loam, 2 to 5% slopes
DcB	Delanco silt loam, 3 to 8% slopes
Iu	Iuka silt loam
LeB2	Legore silt loam, 3 to 8% slopes, moderately eroded
LeD2	Legore silt loam, 15 to 25% slopes, moderately eroded
MkA	Matapeake silt loam, 0 to 2% slopes
MkB	Matapeake silt loam, 2 to 5% slopes, moderately eroded

Prime Farmland Soils (Within the Study Area)	
MsB2	Montaldo silt loam, 3 to 8% slopes, moderately eroded
NeB2	Neshaminy silt loam, 3 to 8% slopes, moderately eroded
ShB	Sassafras sandy loam, 2 to 5% slopes
SlB	Sassafras loam, 2 to 5% slopes
SuB2	Sunnyside fine sandy loam, 0 to 5% slopes, moderately eroded
WdB	Woodstown sandy loam, 2 to 5% slopes
WoB	Woodstown loam, 2 to 5% slopes



0 0.25 Mile 0.5 Mile

Soils of Statewide Importance (Within the Study Area)	
AdA	Aldino silt loam, 0 to 3% slopes
AdB2	Aldino silt loam, 3 to 8% slopes, moderately eroded
Br	Barclay silt loam
BtA	Beltsville silt loam, 0 to 2% slopes
BtB	Beltsville silt loam, 2 to 5% slopes
BtC2	Beltsville silt loam, 5 to 10% slopes, moderately eroded
ChC2	Chillum silt loam, 5 to 10% slopes, moderately eroded
CkC2	Chillum–Neshaminy silt loams, 5 to 10% slopes, moderately eroded
CmB	Christiana loam, 2 to 5% slopes
CmC2	Christiana loam, 5 to 10% slopes, moderately eroded

Soils of Statewide Importance (Within the Study Area)	
Fs	Fallsington loam
JpB	Joppa gravelly sandy loam, 2 to 5% slopes
JpC2	Joppa gravelly sandy loam, 5 to 10% slopes, moderately eroded
LeC2	Legore silt loam, 8 to 15% slopes, moderately eroded
LIB	Lenoir loam, 0 to 5% slopes
LmB	Lenoir silt loam, 0 to 5% slopes
LmC2	Lenoir silt loam, 5 to 12% slopes, moderately eroded
MkC2	Matapeake silt loam, 5 to 12% slopes, moderately eroded
NeC2	Neshaminy silt loam, 8 to 15% slopes, moderately eroded
ShC2	Sassafras sandy loam, 5 to 10% slopes, moderately eroded

Legend *

Soils of Statewide Importance

Prime Farmland Soils

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

FIGURE III–9
Soils Within the Study Area

Sheet 1 of 2

N

Maryland Transportation Authority

* *There are no listed Soils of Statewide Importance or Prime Farmland Soils located within Baltimore City Limits*

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Match Line – See Sheet 1 of 2

Study Area

Prime Farmland Soils (Within the Study Area)	
ChB2	Chillum silt loam, 2 to 5% slopes, moderately eroded
CkB2	Chillum–Neshaminy silt loam, 2 to 5% slopes
DcB	Delanco silt loam, 3 to 8% slopes
Iu	Iuka silt loam
LeB2	Legore silt loam, 3 to 8% slopes, moderately eroded
LeD2	Legore silt loam, 15 to 25% slopes, moderately eroded
MkA	Matapeake silt loam, 0 to 2% slopes
MkB	Matapeake silt loam, 2 to 5% slopes, moderately eroded

Prime Farmland Soils (Within the Study Area)	
MsB2	Montaldo silt loam, 3 to 8% slopes, moderately eroded
NeB2	Neshaminy silt loam, 3 to 8% slopes, moderately eroded
ShB	Sassafras sandy loam, 2 to 5% slopes
SIB	Sassafras loam, 2 to 5% slopes
SuB2	Sunnyside fine sandy loam, 0 to 5% slopes, moderately eroded
WdB	Woodstown sandy loam, 2 to 5% slopes
WoB	Woodstown loam, 2 to 5% slopes

0 0.25 Mile 0.5 Mile

Legend *

Soils of Statewide Importance

Prime Farmland Soils

Soils of Statewide Importance (Within the Study Area)	
AdA	Aldino silt loam, 0 to 3% slopes
AdB2	Aldino silt loam, 3 to 8% slopes, moderately eroded
Br	Barclay silt loam
BtA	Beltsville silt loam, 0 to 2% slopes
BtB	Beltsville silt loam, 2 to 5% slopes
BtC2	Beltsville silt loam, 5 to 10% slopes, moderately eroded
ChC2	Chillum silt loam, 5 to 10% slopes, moderately eroded
CkC2	Chillum–Neshaminy silt loams, 5 to 10% slopes, moderately eroded
CmB	Christiana loam, 2 to 5% slopes
CmC2	Christiana loam, 5 to 10% slopes, moderately eroded

Soils of Statewide Importance (Within the Study Area)	
Fs	Fallsington loam
JpB	Joppa gravelly sandy loam, 2 to 5% slopes
JpC2	Joppa gravelly sandy loam, 5 to 10% slopes, moderately eroded
LeC2	Legore silt loam, 8 to 15% slopes, moderately eroded
LIB	Lenoir loam, 0 to 5% slopes
LmB	Lenoir silt loam, 0 to 5% slopes
LmC2	Lenoir silt loam, 5 to 12% slopes, moderately eroded
MkC2	Matapeake silt loam, 5 to 12% slopes, moderately eroded
NeC2	Neshaminy silt loam, 8 to 15% slopes, moderately eroded
ShC2	Sassafras sandy loam, 5 to 10% slopes, moderately eroded

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

FIGURE III–9
Soils Within the Study Area

Sheet 2 of 2

N

Maryland Transportation Authority

* There are no listed Soils of Statewide Importance or Prime Farmland Soils located within Baltimore City Limits

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The entire study area is within the State-certified PFA (as discussed previously). Since PFAs are designed for growth, thereby discouraging urban sprawl in other less developed areas, they would be considered areas committed to urban development. Prime Farmland Soils and Soils of Statewide Importance located within the study area would therefore be exempt from Farmland Protection Policy Act of 1981 (FPPA) coordination. Detailed descriptions of the characteristics of the soil associations in the study area can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Natural Environment Technical Report* (Authority, 2004) prepared for this project.

3. Water Resources

a. Surface Water

There are two watersheds located within the study area; the Patapsco River Watershed and the Gunpowder River Watershed (***Figure III-10***). The only sub-watershed of the Patapsco River Watershed within the study area is the Back River, of which Redhouse Creek and Stemmers Run 3rd Order Watersheds are included (***Table III-7***). Two sub-watersheds within the Gunpowder River Watershed include the Bird River and the Gunpowder River Sub-Watersheds. The Bird River Sub-Watershed is made up of two 3rd order watersheds within the study area, including the Bird River and the White Marsh Run Watershed. The Lower Gunpowder 3rd Order Watershed is within the Gunpowder River Sub-Watershed (within the study area).

Water quality criteria specific to Designated Use is defined by Code of Maryland Regulations (COMAR) 26.08.02.03. The Designated Use for all waters within the study area and their watershed hierarchy is shown in ***Table III-7***.

Criteria for Use I Waters include maintaining water contact recreation and protection of aquatic life. In-stream work is prohibited during the period between March 1st and June 15th during any year for Use I Waters. Criteria for Use IV Waters include maintaining recreational (stocked) trout waters, water contact recreation, and protection of aquatic life. In-stream work is prohibited in Use IV Waters during the period between March 1st and May 31st during any year.

b. Water Quality

Water quality standards are provisions of the State or Federal law, which consist of a Designated Use or Use for the Waters of the United States, and water quality criteria for such waters are based upon such uses. Water quality standards have been established to protect public health or welfare and enhance the quality of the water (40 CFR 131.3).

Watershed	Sub–Watershed	3rd Order Watershed
Patapsco River	Back River	Herring Run Redhouse Creek Stemmers Run
Gunpowder River	Bird River	White Marsh Bird River
	Gundpowder River	Lower Gunpowder

Legend

- Floodplain Boundary
- Watershed Boundary
- SWSB — Subwatershed Boundary
- 3WSB — 3rd Order Watershed Boundary
- Gunpowder Watershed
- Patapsco Watershed

BALTIMORE COUNTY
BALTIMORE CITY

100 Year Floodplain
Back River Sub–Watershed
Study Area
Redhouse Creek 3rd Order Watershed
Herring Run 3rd Order Watershed
Patapsco Watershed
Moores Run
Herring Run
Redhouse Creek
100 Year Floodplain
Bird River Sub–Watershed
White Marsh Run
White Marsh 3rd Order Watershed
100 Year Floodplain
Stemmers Run 3rd Order Watershed
Stemmers Run
100 Year Floodplain
Middle River – Browns Sub–Watershed
Lower Gunpowder 3rd Order Watershed
Gunpowder Sub–Watershed
Gunpowder Falls
100 Year Floodplain
Honeygo Run
100 Year Floodplain
Bird River 3rd Order Watershed
100 Year Floodplain
Gunpowder Watershed
100 Year Floodplain
Gunpowder River Sub–Watershed

0 0.25 Mile 0.5 Mile

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FIGURE III–10
100 Year Floodplain & Watershed Boundaries

N

Maryland Transportation Authority

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Table III-7. Water Resources Within the Study Area

Watershed	Sub-Watershed	3rd Order Watershed	Water Body	Designated Use Within Study Area
Patapsco River	Back River	Redhouse Creek	Moores Run	Use I
			Redhouse Creek	Use I
		Stemmers Run	Stemmers Run	Use I and Use IV (Use IV north of I-95)
Gunpowder River	Bird River	White Marsh	South Fork (White Marsh Run)	Use IV
			White Marsh Run	
			Honeygo Run	
		Bird River	Bird River	Use I
	Gunpowder River	Lower Gunpowder	Gunpowder tributary	Use I

Sampling sites have been selected using best professional judgment, in combination with existing data acquired from Baltimore County and the Maryland Biological Stream Survey. Water quality samples will be tested for pollutants, nutrients, and biological parameters. The testing will include checking for the 13 metals identified in the Clean Water Act as Priority Pollutants. These will be analyzed using the Environmental Protection Agency's (EPA) *Recommended Fresh Water Quality Criteria* (EPA 822-Z-99-001) and EPA Nutrient Guidance: Rivers and Streams (EPA, 2000). (*Test results will be included here upon receipt*)

c. Waters of the United States (WUS)

The study area lies in a fall zone between the Coastal Plain and Piedmont Physiographic Provinces, and as a result, the geomorphology of fluvial systems is varied. The study area encompasses the headwater region of the Bird River and Gunpowder River tributaries. These areas exhibit typically Coastal Plain characteristics, as the streams start in gently rolling or nearly level topography. The substrate is mostly fine-grained gravel, sand, and finer particles. Redhouse Creek and Stemmers Run exhibit characteristics of upper perennial Piedmont streams with a steeper grade, and meander within a narrow floodplain. The substrate contains primarily cobble and low coarse gravel.

Moores Run, White Marsh Run, and the South Fork of White Marsh Run are also within a characteristically Coastal Plain area. Stream gradients are low and typically meander within wide floodplains. Within the study area, Honeygo Run exhibits more characteristics of the Piedmont; its flow is constricted within a valley. ***Appendices A and B*** illustrate the location of streams/waters of the US within the study area.

d. Wild and Scenic Rivers

Based on a review of Natural Resources Article of the Maryland Code -designated Wild and Scenic Rivers list, and email correspondence with Maryland Department of Natural Resources (DNR) (***Appendix C***, January 28, 2004), there are no Wild or Scenic Rivers (or their tributaries) located within the study area.

e. Water Supply/Groundwater

According to the *Baltimore County Water Supply and Sewerage Plan (1990-2000)* (Baltimore County Office of Planning, 1997), the entire study area is located within the Metropolitan Water System, which is a public water supply secured from three surface water bodies, including the Gunpowder River, the North Branch of the Patapsco River, and the Susquehanna River. The Susquehanna River is used only on an emergency basis.

Groundwater in the study area is obtained from the Piedmont and Coastal Plain provinces in Baltimore County. The Piedmont wells supply domestic and commercial demands due to small individual well yields (1 to 100 gallons per minute (GPM)). Crystalline rocks, including schist, gneiss, gabbro, granite, and marble are the chief aquifers. The Coastal Plain sub-area contains large quantities of groundwater in artesian (or semi-artesian) or water table conditions. Well yields vary from a few GPM to as much as 1,000 GPM. Sand and gravel are the major aquifers, which are separated by impervious confining clay layers.

f. Floodplains

The Federal Emergency Management Agency (FEMA)-designated 100-year floodplains within the study area occur along Moores Run, Redhouse Creek, Stemmers Run, White Marsh Run, Honeygo Run, and Gunpowder Falls (***Table III-8*).** The locations of floodplains within the study area are depicted on ***Figure III-10***.

4. Ecological Conditions

a. Terrestrial Habitat

***Woodlands*:** The majority of wooded acres within the study area include patches of remnant forests within urban or industrial land, abandoned land that is returning to forest, and hedgerows disturbed by human interference. These areas are characteristically disjunct, non-contiguous narrow stands of trees comprised of early successional and/or introduced species. These stands occur in narrow strips between I-95, residential communities, and commercial or industrial properties.

Table III-8. Floodplains Within the Study Area

Floodplain	Length/Crossing and Description
Moores Run	This floodplain is 400 feet wide where I-95 crosses the stream (***Appendix A Plate 1 and Appendix B Plate 27***), and extends east and west outside of the study area. The land within this floodplain is forested.
Redhouse Creek	This floodplain is 200 feet wide where I-95 crosses the stream (***Appendix A Plate 6 and Appendix B Plate 32***), and extends east and west outside of the study area. The land within this floodplain is forested.
Stemmers Run	This floodplain is approximately 700 feet wide. Both I-95 and I-695 cross the floodplain (***Appendix A Plate 11 and Appendix B Plate 37***), which extends east and west outside of the study area. The land within this floodplain is forested.
White Marsh Run	This floodplain is 600 feet wide where I-95 crosses the stream (***Appendix A Plate 18 and Appendix B Plate 44***), and extends east and west outside of the study area. The land within this floodplain is forested.
Honeygo Run	This floodplain is 150 feet wide where I-95 crosses the stream (***Appendix A Plate 22 and Appendix B Plate 48***), and extends east and west outside of the study area. The land within this floodplain is forested.
Unnamed tributary to Gunpowder Falls, just north of New Forge Road	This floodplain is 200 feet wide where I-95 crosses the stream (***Appendix A Plate 26 and Appendix B Plate 52***), and extends east and west outside of the study area. The land within this floodplain is forested.

Forest associations were mapped based on species composition, and boundaries were drawn around forested areas of homogeneous species composition (Brush, Lenk and Smith, 1980). All forests within the study area have been disturbed through mankind either directly by logging or agriculture, or indirectly through reduced water quality and severity of flow in riparian areas.

Two forest associations are located within the study area (***Figure III-11***):

- A disturbed form of the sycamore, green ash, box elder, silver maple association is found along the bottomlands of Moores Run, Redhouse Creek, and Stemmers Run.

- A disturbed form of the tulip poplar association is found in the forests around the headwaters of an unnamed tributary to Bird River and an unnamed tributary to Gunpowder River.

Legend

- *Sycamore, Green Ash, Box Elder, Silver Maple Forest Association*
- *Tulip Poplar Forest Association*
- *Forest Interior Dwelling Species (FIDS) Corridors & Large Tree Stands*
- *Large Tree*
- *Significant Tree*

Study Area

Match Line See Sheet 2 of 2

Note: For tree sizes and species, see plates in Appendix A & B.

0 0.25 Mile 0.5 Mile

N

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

FIGURE III–11
Forest Interior Dwelling Species (FIDS)

Sheet 1 of 2

Maryland Transportation Authority

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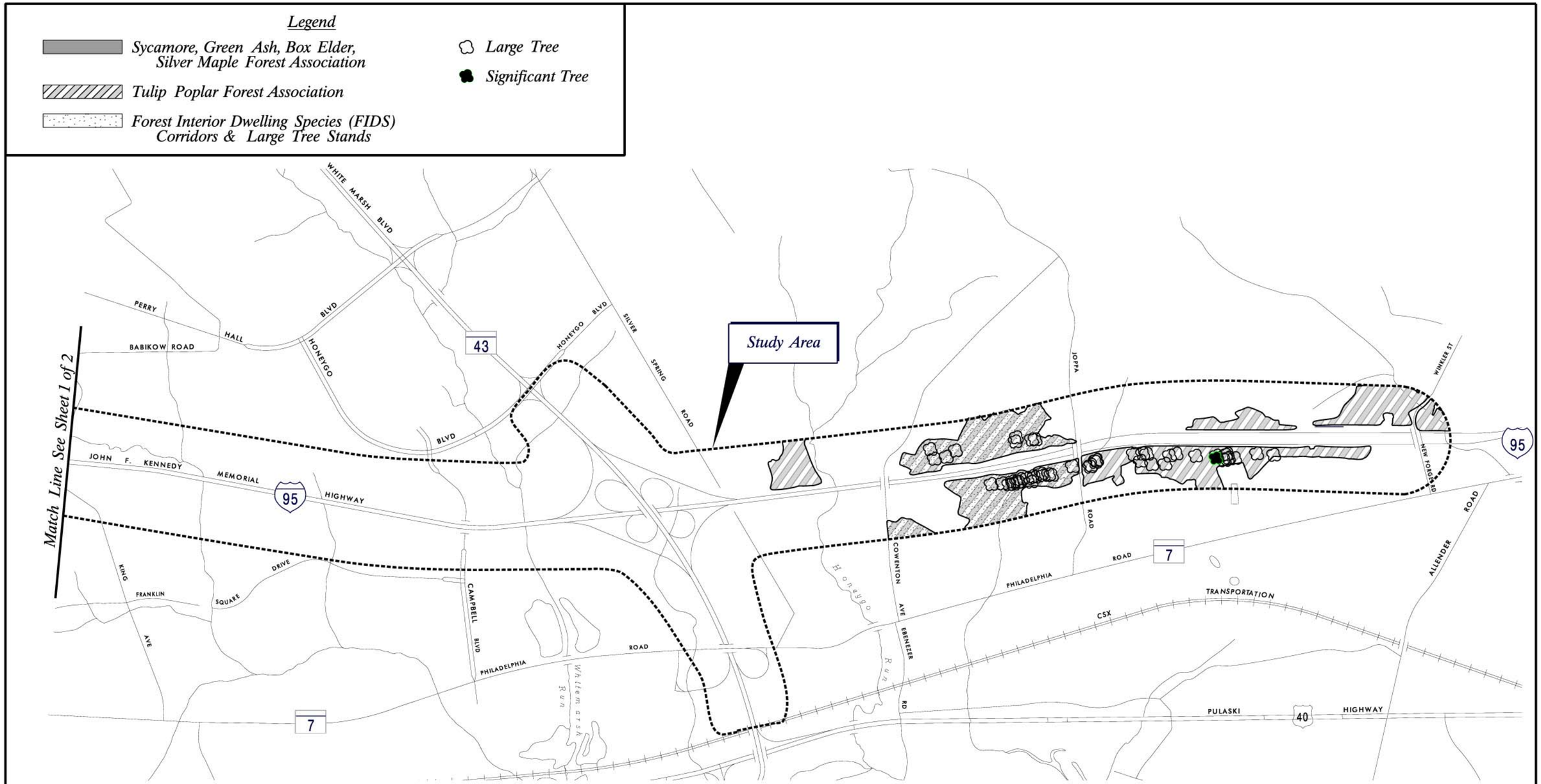

Note: For tree sizes and species, see plates in Appendix A & B.

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

FIGURE III–11
Forest Interior Dwelling Species (FIDS)

Sheet 2 of 2

Maryland Transportation Authority

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Forest Interior Dwelling Species (FIDS): Under the Maryland Nongame and Endangered Species Conservation Act (Md. Code Ann., Nat. Res. II § 10-2A-02) it is the policy of the State to conserve species of wildlife for human enjoyment, for scientific purposes, and to ensure their perpetuation as viable components of their ecosystems. Forest Interior Dwelling Species (FIDS) are an important part of Maryland's natural heritage and their habitat is monitored by DNR Heritage and Wildlife Service. FIDS act as an "umbrella species" which are used to indicate the quality and benefits from functions and values of forests ecosystems.

Based on initial correspondence with DNR, no FIDS areas were identified within the study area. However, additional field investigations revealed two forested areas within the study area that meet FIDS habitat requirements (***Figure III-11***), which, according to *A Guide to the Conversation of Forest Interior Dwelling Birds in Chesapeake Bay Critical Area*, include: 1) contiguous upland forests of 50 acres or greater; 2) riparian forests greater than 300 feet in width that border a stream for at least 600 feet; 3) riparian forests at least 150 feet wide and connected to one of the above; or 4) forest patches 10 acres or larger and within 300 feet of the first two definitions. (Please refer to ***Appendix C*** for copies of the DNR coordination letters.) These forests buffer the headwaters of an unnamed tributary to the Bird River (BRBR-WUS1 and tributaries) and are mixed with tulip poplar, red maple, and oaks as dominant canopy species. Coordination will continue throughout the project planning process to identify/confirm FIDS habitat within the study area.

Large/Significant Trees*:** A large and significant tree survey was conducted within the study area during July-September 2003. Only one significant tree (red maple) was found within the study area. This tree is located on the east side of I-95, and has a diameter at breast height (DBH) of 55 inches, and is in the 80th percentile of the State champion tree. Additionally, 83 large individual trees were found throughout the study area. Locations of large and significant trees within the study area can be found in ***Appendix A and Appendix B.

b. Aquatic Habitat

Aquatic habitat in the study area will be assessed by evaluating water quality parameters indicative of the health of aquatic systems. These parameters will include potential of hydrogen (pH), dissolved oxygen (DO), conductivity, temperature, turbidity, and Fish and Benthic Indices of Biotic Integrity (IBI). COMAR has specific standards for each stream use classification. ***Table III-9*** provides the COMAR regulations/parameters.

Table III-9. Water Quality Parameters for Aquatic Habitat

Parameter	Description	
	Use I	**Use IV**
pH	Not less than 6.5 or greater than 8.5	Not less than 6.5 or greater than 8.5
Dissolved Oxygen (DO)	May not be less than 5 mg/l	May not be less than 5 mg/l
Temperature	May not exceed 90F or 32C	May not exceed 75F or 23.9C
Turbidity	Not greater than 150 turbidity units	Not greater than 150 turbidity units
Source: COMAR 26.08.02.04		

Sampling sites have been selected using best professional judgment, in combination with information from Baltimore County and the Maryland Biological Stream Survey (MBSS). Water quality samples were tested for the parameters listed in ***Table III-9*** in March 2004. Analyses results are provided in Chapter IV: *Environmental Consequences*.

c. Wetlands

Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the United States without a permit. Under the Clean Water Act, "waters of the United States" include, among other things, wetlands that are connected to navigable rivers and streams. The agency with permitting authority under Section 404 is the U.S. Army Corps of Engineers (USACE). In making permit decisions, the USACE must follow guidelines issued by the EPA under Section 404(b)(1) of the Clean Water Act. The Section 404(b)(1) guidelines establish several requirements that must be met in order for a Section 404 permit to be issued. One key element of the Section 404(b)(1) guidelines is the requirement that a Section 404 permit can be granted only for the practicable alternate that has the least impact to the aquatic ecosystem, unless that alternate has other significant adverse environmental impacts. This requirement is commonly known as the requirement to select the 'least environmentally damaging practicable alternate' (LEDPA).

Wetlands within the study area can be classified as either isolated, headwater, or floodplain wetlands. The isolated wetlands are typically less than one quarter-acre in size, occurring in areas of human disturbance throughout the study area. The source of these wetlands can include the underground water table or ephemeral channels.

Floodplain wetlands occur along the streams within the study area, and are hydrologically connected through locally high groundwater (in relation to the various streams in the study area) and large tracts of fine-grained and organic soils.

Wetland identification and delineation efforts were conducted from May to October 2003 in accordance with the *Army Corps of Engineers Wetland Delineation Manual*, Technical Report Y-87-1 (USACE Waterways Experiment Station, 1987). Wetland functions/values were assessed following *The Highway Workbook Supplement: Wetland Functions and Values – A Descriptive Approach* (USACE, New England Division, 1993). The *Wetland Delineation Report for Section 100: 1-95, I-895(N) Split to North of MD 43* (Authority, 2004) details the findings of the wetland delineation and wetlands functional assessment. ***Appendix A and B*** illustrate the locations of wetlands within the study area.

Wetland Jurisdictional Determinations (JDs) were held on the following dates: November 18, 19, and 21, 2003; January 14, 2004; and XXX, 2004. Detailed meeting minutes from the JDs are included in ***Appendix E*** of the Environmental Assessment (EA) (*2004 JDs have not occurred yet. Text was prepared as it will appear prior to circulation)*.

Wetlands within the Moores Run 3rd Order Watershed fall into two main hydrologic groups; slope/depression wetlands and riverine wetlands. Slope/depression wetlands function by discharging water due to vertical fluctuation of the water table, and are located at or near the headwaters of streams.

Wetlands within the Redhouse Creek 3rd Order Watershed include headwater wetlands and floodplain wetlands. The headwater wetlands have been degraded due to development (including the original construction of I-95 in 1963). The majority of floodplain wetlands in this watershed have been altered or filled due to development.

Wetlands within Stemmers Run 3rd Order Watershed are headwater and floodplain wetlands that have historically been degraded. Most of the headwater wetlands have been filled, shifted, relocated, or otherwise altered by the construction of I-695, I-95, and surrounding developments. These wetlands are presently connected by ephemeral or concrete channels. The floodplain wetlands within the Stemmers Run watershed have been filled or altered (primarily by drainage channels) in the area of the I-95/I-695 Interchange. Floodplain wetlands south and east of this interchange have sporadic hydroperiods because of the flashy flows of Stemmers Run and the entrenchment of the stream itself. A flashy flow occurs when urbanized watersheds change the flow regime of a stream to include a higher frequency of faster, increased volume, low duration flows.

Wetlands within the White Marsh Run 3rd Order Watershed consist mostly of headwater wetlands and a few floodplain wetlands. The Bird River and Gunpowder River 3rd Order Watershed wetlands are headwater wetlands. Some disturbed wetlands within the existing right-of-way of I-95 have been cut off from a hydrological source, but the majority are inter-connected through storm water pipes or ephemeral streams.

d. Terrestrial Wildlife

A field investigation including observation by sight, song, call, and sign indicated that there are numerous bird species inhabiting various landscapes of the study area. These landscapes include residential, industrial, agricultural, commercial, marshland, forested, and open space. ***Table III-10*** summarizes the bird species and the habitat(s) where they were observed.

Evidence of terrestrial wildlife, both mammals and herpetiles, was found throughout the study area, primarily within forested areas, waterways, and wetlands. Observed signs of mammals and herpetiles include observed tracks and scat, roadkill, sightings, dwellings, and breeding calls. The following provides a list of the wildlife observed during the studies:

- White tail deer (*Odocoileus virginianus)*
- Eastern chipmunk (*Tamias striatus*)
- Gray squirrel (*Sciurus carolinensis*)
- Little brown myotis (*Myotis lucifugus*)
- Deer mouse (*Peromyscus maniculatus*)
- Eastern cottontail (*Sylvilagus floridanus*)
- Spring peeper (*Psuedacris crucifer*)
- American toad (*Bufo americanus*)
- Black racer (*Coluber constrictor*)
- Snapping turtle (*Chelydra serpentina*)
- Raccoon (*Pyrocon lotor)*
- Opossum (*Didelphis marsupialis*)
- Woodchuck (*Marmota monax*)
- Red fox (*Vulpes fulva*)
- Green frog (*Rana clamitanc*)
- Gray tree frog (*Hyla versicolor*)
- Garter snake (*Thamnophis sirtalis*)
- Wood frog (*Rana sylvatica*)
- Black ratsnake (*Elaphe obsolete*)

e. Endangered and Threatened Species

Section 7 of the Endangered Species Act requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) regarding the potential impacts of a federal action on federally listed threatened and endangered species (16 U.S.C. §§ 1531-1544). The first step in the Section 7 consultation process is a request to the USFWS for a list of the federally listed threatened and endangered species that may be present in the action area for the project. If the USFWS identifies species that may be present, additional informal or formal consultation is needed. Such consultation may involve preparation of a Biological Assessment and issuance of a Biological Opinion. However, if the USFWS determines that there are no federally listed threatened or endangered species in the action area, no further consultation under Section 7 is required.

In addition to the federal requirements established under the Endangered Species Act, actions within Maryland also are protected under state law. Species that are not protected under the federal law may still be protected under the state law. The Maryland Nongame and Endangered Species Conservation Act (Md. Natural Resources Code Ann. § 10-2A-01 et. seq.) requires the protection of listed State threatened and endangered species. The same measures of protection as the Federal Endangered Species Act are required.

Table III-10. Bird Species Observed in the Study Area

Bird Species Observed in the Study Area		Industrial	Commercial	Residential	Agricultural	Forested	Marshland	Open Space
Common Name	**Scientific Name**							
House sparrow	*Passer domesticus*	X	X	X				
Black capped chicadee	*Parus atricapillus*			X		X		
Hairy woodpecker*	*Picoides villosus*			X		X		
American robin	*Turdus migratorius*			X	X	X		
European starling	*Sturnus vulgaris*	X	X	X				
European rock dove or pigeon	*Columba livia*	X	X	X				
Northern mockingbird	*Mimus polyglottos*			X	X			X
Blue jay	*Cyanocitta cristata*			X		X		
Slate colored junco	*Junco hyemalis*			X		X		
Northern cardinal	*Cardinalis cardinalis*			X		X		
Morning dove	*Zenaida macroura*			X	X		X	X
Northern flicker	*Colaptes auratus*				X	X		X
American crow	*Corvus brachyrhynchos*		X	X	X	X		
Sharp-shinned hawk	*Accipiter striatus*					X		
Rufous-sided towhee	*Pipilo erythropthalamus*				X			X
Killdeer	*Charadrius vociferus*		X					X
Red winged blackbird	*Agelaius phoenceus*			X	X		X	
Common grackle	*Quiscalus quiscula*			X	X		X	
Red-tailed hawk	*Buteo jamacensis*				X	X		
Turkey vulture	*Cathartes aura*			X	X	X		
Chimney swift	*Chaetura pelagica*			X				
Eastern kingbird	*Tyrannus tyrannus*			X	X			X
Mallard	*Anas platyrhyncos*		X				X	
Phoebe	*Sayornis phoebe*				X	X		
Belted kingfisher	*Ceryle alcyon*						X	
Eastern wood-pewee	*Conotopus virens*					X		
American gold finch	*Carduelis tristis*			X	X	X		
Song sparrow	*Melospiza melodia*				X		X	
Blue-winged warbler	*Vermivora pinus*				X			
Brown-headed cowbird	*Molothrus ater*				X	X		
Tufted titmouse	*Parus bicolor*			X		X		
Tree swallow	*Tachycineta bicolor*						X	X

***** *Forest Interior Dwelling Species (FIDS)*

According to the USFWS (***Appendix C***, September 25, 2003), "except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the study area."

Correspondence with the DNR Wildlife and Heritage Division (***Appendix C***, January 6, 2004) identified the known presence and location of a Least Tern *(Sterna antillarum)* colony and the potential presence of four plant species of concern within the study area. ***Table III-11*** provides a summary of the species identified by DNR, their general habitat, and the appropriate survey period in which to conduct species surveys.

Table III-11. Threatened and Endangered Species Recorded Within/Near the Study Area

Species	State Status	Habitat Requirements	Field Survey Period
Least Tern (*Sterna antillarum*)	Threatened (breeding)	Known to occur on the gravel rooftop of an industrial park within the study area.	Breeding season – 15 April through 31 July (field survey will verify the presence of this species at the identified location)
Dwarf Iris (*Iris prismatica*)	Endangered	Bogs, marshes, shores, swamps, and moist meadows	Flowering period – May through July
Canada Burnet (*Sanguisorba Canadensis*)	Threatened	Bogs, wet meadows, spring-fed herbaceous marshes, and streamside fields	Flowering period – June through October
Velvety Sedge (*Carex vestita*)	Endangered	Sandy woods and swamps; low woods; usually dry, sandy soil of woods and shaded edges; glades; and borders of streams	Flowering and fruiting periods – flowering is March through April, fruiting is May through June (fruiting is the best period for identification)
Ostrich Fern (*Matteucia struthiopteris*)	Rare	Rich or bottomland-thickets or woods in alluvium, and calcareous soil	Spring to late summer - Fruiting period is in late summer; fronds are well developed from spring to late summer.

Additional habitat requirements for these species are being identified through the review of taxonomic keys, scientific journals, and websites, in addition to ongoing coordination with DNR. Field surveys of known species locations will be performed (during the appropriate survey period) for use as a reference habitat. These habitat surveys will be performed during the breeding season for the Least Tern, and during the fruiting and flowering periods for the plant species (late spring and fall). Habitat information will then be compared with potentially suitable habitats within existing and proposed right-of-way limits for the proposed project. If suitable habitat(s) are identified within the study area, additional coordination with DNR will be undertaken to determine the need for a species survey(s). The Authority will continue to coordinate with DNR throughout the project planning process regarding the presence and habitat requirements of these species.

f. Unique and Sensitive Areas

Unique, sensitive, and aesthetic areas generally include resources that have unique ecological or geological characteristics which are sensitive to adverse environmental impacts, or which provide unique aesthetic value to the public. Unique, sensitive, and aesthetic areas include, but are not limited to: wildlife refuges; natural parks and preserves; waterways protected under the Maryland Scenic and Wild Rivers program; Maryland Environmental Trust Lanes; Chesapeake Bay Critical Area Lanes; scenic waterfalls or bridges; and unique geologic formations.

Based on correspondence with resource and regulatory agencies (***Appendix C***) as well as detailed environmental studies, no areas within the study area were identified as unique or sensitive.

5. Existing Noise Conditions

a. Noise Sensitive Area Description

Twenty-three Noise Sensitive Areas (NSAs) were identified in the study area. Individual noise receptor locations were selected to represent each of the noise sensitive communities potentially affected by project improvements. A total of 72 receptors were identified to represent noise sensitive land uses within the 23 NSAs. Individual noise receptor locations are shown on ***Figure III-12.*** ***Table III-12*** describes each NSA. Additional details regarding the NSAs can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Noise Quality Technical Report* (Authority, 2004) prepared for this project.

BALTIMORE CITY
BALTIMORE COUNTY

Hazelwood Avenue

Chesaco Avenue

Kenwood Avenue

Perry Hall Boulevard

Hamilton Avenue

Golden Ring Road

Philadelphia Road

NSA 1
NSA 2
NSA 3
NSA 4
NSA 5
NSA 6
NSA 7
NSA 8
NSA 9
NSA 10

SR–1
SR–2
SR–3
SR–4
SR–5
SR–6
SR–7
SR–8
SR–9
SR–10
SR–11
SR–12
SR–13
SR–14
SR–15
SR–16
SR–19
SR–20
SR–21
SR–22
SR–23

EXISTING BARRIER
EXISTING BARRIER

1–1
2–1
3–1 3–2 3–3 3–4 3–5 3–6 3–7 3–8
4–1 4–2 4–3
5–1 5–2 5–3 5–4 5–5
6–1 6–2 6–3 6–4 6–5
7–1 7–2 7–3 7–4 7–5 7–6 7–7 7–8
8–1 8–2 8–3
9–2 9–3
10–1

895
95
695

Match Line – See Sheet 2 of 3

7

Legend

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

0 600' 1200'

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

FIGURE III–12
Noise and Air Quality Sensitive Receptor Locations

Sheet 1 of 3

N

Maryland Transportation Authority

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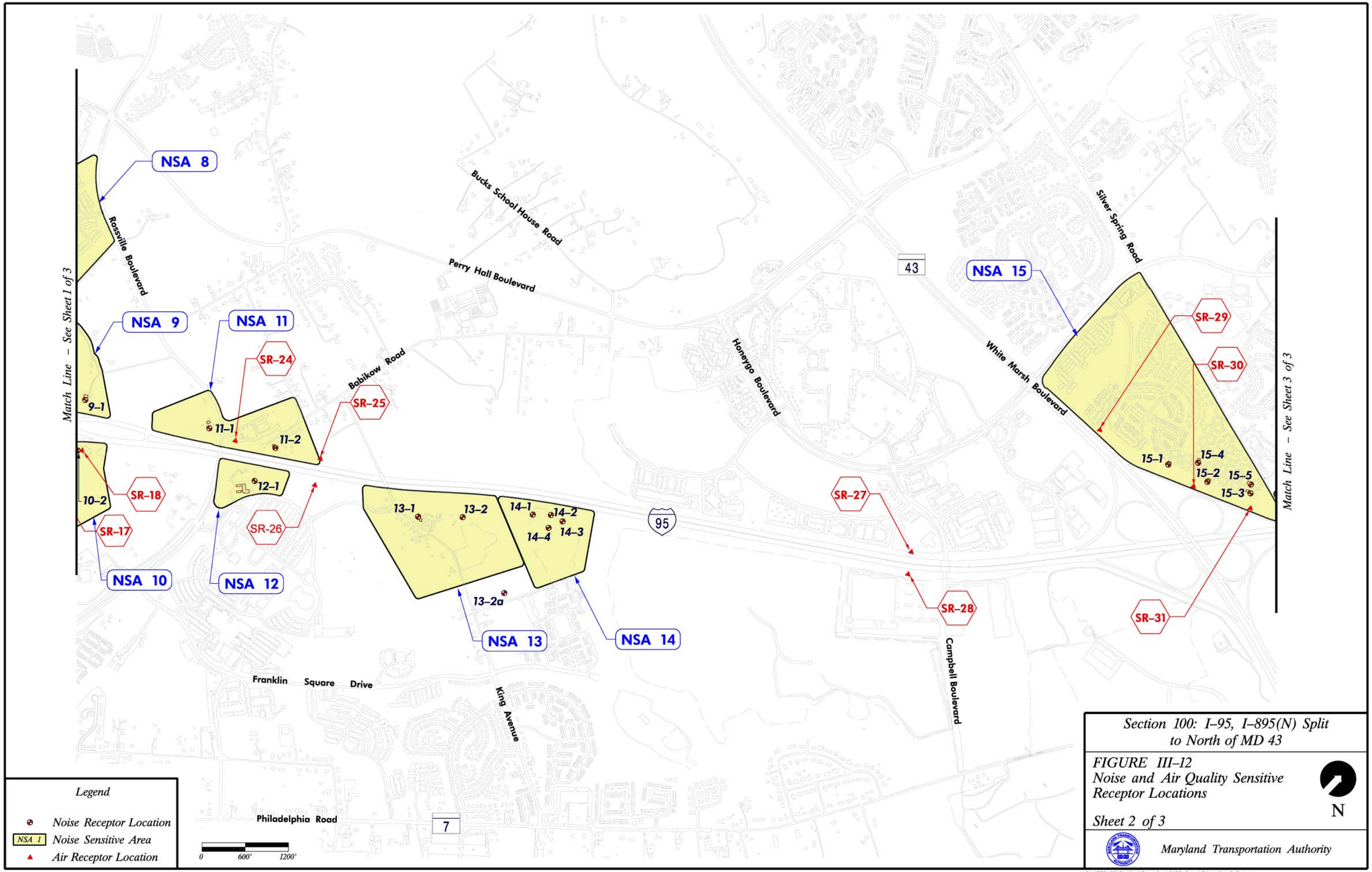

Section 100: I–95, I–895(N) Split to North of MD 43

FIGURE III–12
Noise and Air Quality Sensitive Receptor Locations

Sheet 2 of 3

Maryland Transportation Authority

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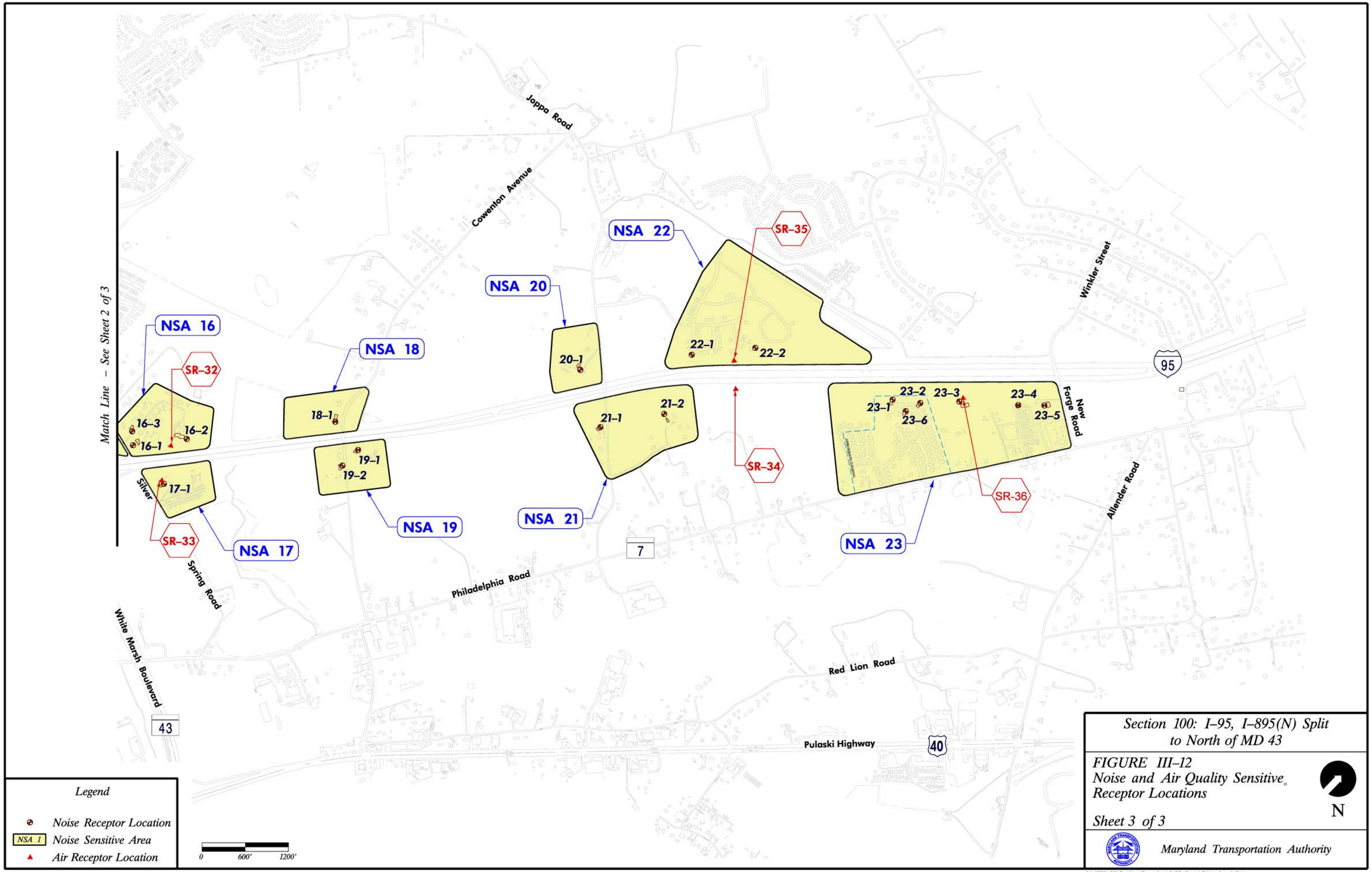
Match Line – See Sheet 2 of 3
Joppa Road
Cowenton Avenue
Winkler Street
NSA 16
SR–32
16–3
16–2
16–1
NSA 18
18–1
19–1
19–2
NSA 20
20–1
NSA 22
SR–35
22–1
22–2
21–1
21–2
SR–34
23–1
23–2
23–3
23–4
23–5
23–6
New Forge Road
SR–36
Allender Road
95
Silver
17–1
SR–33
NSA 17
NSA 19
NSA 21
NSA 23
Spring Road
7
Philadelphia Road
White Marsh Boulevard
43
Red Lion Road
Pulaski Highway
40
Legend
Noise Receptor Location
NSA 1 Noise Sensitive Area
Air Receptor Location
0
600'
1200'
Section 100: I–95, I–895(N) Split to North of MD 43
FIGURE III–12
Noise and Air Quality Sensitive Receptor Locations
Sheet 3 of 3
N
Maryland Transportation Authority
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Table III-12. Summary of Noise Sensitive Areas and Represented Resources

NSA	Receptors Located Within the NSA	Represented Resources	Distance From Roadway
1	Receptor 1-1	80 single-family residences, 38 single-family townhomes	125 ft.
2	Receptor 2-1	5 single-family residences (two story)	290 ft.
3	Receptors 3-1 to 3-7	150+ single-family residences	200 to 400 ft.
4	Receptors 4-1 to 4-3	50+ single-family residences	200 to 350 ft.
5	Receptors 5-1 to 5-5	50 single-family residences	190 to 425 ft.
6	Receptors 6-1 to 6-5	75 single-family residences	180 to 500 ft.
7	Receptors 7-1 to 7-8	100+ single-family residences	150 to 500 ft.
8	Receptors 8-1 to 8-3	20+ apartment buildings	125 to 450 ft.
9	Receptors 9-1 to 9-3	3 single-family residences, 1 church	100 to 400 ft.
10	Receptors 10-1 and 10-2	14 single-family residences	100 to 125 ft.
11	Receptors 11-1 and 11-2	6 single-family residences	200 to 120 ft.
12	Receptor 12-1	Part of Essex Community College Campus	210 ft.
13	Receptors 13-1 and 13-2	14 single-family residences, community park	325 to 350 ft.
14	Receptors 14-1 to 14-4	100+ single-family townhomes	150 to 340 ft.
15	Receptors 15-1 to 15-5	130+ single-family residences, 150 single-family townhomes, 10 apartment buildings	160 to 360 ft.
16	Receptors 16-1 to 16-3	19 single-family residences, 1 daycare	150 to 350 ft.
17	Receptor 17	2 single-family residences	240 ft.
18	Receptor 18-1	2 single-family residences	160 ft.
19	Receptors 19-1 and 19-2	3 single-family residences	105 to 300 ft.
20	Receptors 20-1	3 single-family residences	240 ft.
21	Receptors 21-1 and 21-2	9 single-family residences	440 to 460 ft.
22	Receptors 22-1 and 22-2	130+ single-family residences	160 to 220 ft.
23	Receptors 23-1 to 23-6	90+ single-family residences, 1 church	290 to 470 ft.

b. Existing Noise Conditions

Background: Noise monitoring for this study was conducted on Tuesdays, Wednesdays, and Thursdays to ensure that peak periods were accurately evaluated. Field measurements of ambient noise levels were performed to determine existing (2003) noise levels and to calibrate FHWA's Traffic Noise Model (TNM) Version 2.1. Noise measurements were performed during worst-case noise hours using Metrosonics dB 3080 Noise Monitors.

Four twenty-four hour noise-monitoring sessions were conducted from 2:00 PM on July 29, 2003 to 2:00 PM July 30, 2003 at the following locations:

- 1020 Flintshire Road (Between Receptor 6-5 and 7-1)
- 11 Glendower Court (Receptor 8-2)
- Essex Community College (Receptor 12-1)
- 5501 Loyd Avenue (Receptor 23-3)

The purpose of the twenty-four hour measurements was to determine the diurnal characteristics of the traffic noise in the study area, and to identify peak noise hours. Based on the twenty-four hour analysis, it was determined that short term measurements taken between the hours of 6:00 AM and 6:00 PM would best represent the peak noise conditions for Section 100.

Short-term measurements of 15 minutes were conducted at each NSA on Tuesdays through Thursdays between July 31 and August 19, 2003 to measure the current noise conditions. Traffic classification counts, along with vehicle speeds, were also recorded during monitoring periods.

Existing Noise Levels: Short-term monitoring results are shown in ***Table III-13***. Short-term noise levels were adjusted by determining the difference between the 24-hour peak hour noise level and the 24-hour short-term measurement period noise level, and adding this value to the measured short-term noise level to approximate peak hour noise levels. The resultant adjusted peak hour noise levels are presented in column seven of ***Table III-13.*** Measured noise levels ranged from 51 decibels (dBA) (Receptor 15-1) to 73 dBA (Receptor 11-2). Variations in noise levels are attributable to three factors:

- Traffic flow conditions (volume, speed, and percentage of trucks) during the measurement period,
- Distance from receptor to noise source, and
- Shielding effects from intervening terrain, structures, and vegetation.

Table III-13. Short Term Monitoring Noise Levels

NSA	Receptor No.	Receptor Location	Time	Measured Noise Level Leq (dBA)	Peak Hour Adjustment Factor [1]	Adjusted Peak Hour Noise Level Leq (dBA) [2]
1	1-1	5701 Hamilton Avenue	10:00 AM	64	0	64
2	2-1	5200 McCormick Avenue	10:00 AM	63	0	63
3	3-1	5533 Lanham Way	9:00 AM	61	0	61
	3-2	5306 Dew Garth	9:00 AM	63	0	63
	3-3	5633 Daybreak Terrace	12:00 PM	60	1	61
	3-4	5305 Zangs Lane	9:00 AM	65	0	65
	3-5	519 Lanham Way	11:00 AM	64	1	65
	3-6	5536 Lanham Way	11:00 AM	58	1	59
	3-7	5626 Daybreak Terrace	12:00 PM	57	1	58
	3-8	5703 Daybreak Terrace	9:00AM	58	0	58
4	4-1	5203 Horst Avenue	10:00AM	58	0	58
	4-2	8111 Callo Lane	10:00AM	61	0	61
	4-3	8120 Callo Court	10:00AM	53	0	53
5	5-1	1608 Weyburn Road	11:00AM	61	1	62
	5-2	7 Weyhill Court	11:00AM	60	1	61
	5-3	20 Weyfield Court	11:00AM	62	1	63
	5-4	9 Weyburn Court	11:00AM	54	1	55
	5-5	17 Wyfield Court	10:00AM	58	0	58
6	6-1	1701 Commons Court	12:00PM	60	1	61
	6-2	6201 Commons Road	12:00PM	60	1	61
	6-3	1828 William Court	12:00PM	57	1	58
	6-4	6205 Commons Road	12:00PM	53	1	54
	6-5	1821 William Road	12:00PM	58	1	59
7	7-1	5902 Kenwood Avenue	10:00AM	66	0	66
	7-2	8 Clayfield Court	1:00PM	66	1	67
	7-3	10 Chriswell Court	1:00PM	60	1	61
	7-4	22 Chriswell Court	1:00PM	60	1	61
	7-5	5903 Sandy Spring Road	1:00PM	65	1	66
	7-6	9025 Tarpleys Circle	1:00PM	57	1	58
	7-7	15 Chriswell Court	1:00PM	51	1	52
	7-8	5 Travis Court	1:00PM	53	1	54
8	8-1	7400 Meadow Branch Court	11:30AM	67	0	67
	8-2	11 Glendower Court	11:30AM	65	0	65
	8-3	7421 Kimbark Court	11:30AM	54	0	54
9	9-1	7501 Gilley Terrace	11:15AM	63	1	64
	9-2	7401 Gum Spring Road	11:15AM	65	1	66
	9-3	7403 Gum Spring Road	11:15AM	58	1	59
10	10-1	8601 Trumps Mill Road	11:15AM	64	1	65

Table III-13. Short Term Monitoring Noise Levels

NSA	Receptor No.	Receptor Location	Time	Measured Noise Level Leq (dBA)	Peak Hour Adjustment Factor [1]	Adjusted Peak Hour Noise Level Leq (dBA) [2]
	10-2	8600 Trumps Mill Road	11:15AM	67	1	68
11	11-1	7410 Rossville Boulevard	1:15PM	65	1	66
	11-2	4934 Babikow Road	1:15PM	72	1	73
12	12-1	Essex Community College	1:15PM	65	1	66
13	13-1	5116 King Avenue	2:00PM	60	1	61
	13-2	13-2 Nottingham Park	10:45AM	57	1	58
14	14-1	5010 Castlestone Drive	2:45PM	65	1	66
	14-2	5010 Bridgeford Circle	2:45PM	67	1	68
	14-3	5013 Bridgeford Circle	2:45PM	68	1	69
	14-4	5003 Bridgeford Circle	2:45PM	64	1	65
15	15-1	5035 Clifford Road	2:00PM	51	0	51
	15-2	5105 Clifford Road	2:00PM	59	0	59
	15-3	5129 Clifford Court	2:00PM	57	0	57
	15-4	8600 Lawrence Hill Road	10:00AM	53	0	53
	15-5	5130 Clifford Way	2:00PM	55	0	55
16	16-1	8615 Winding Way	11:45AM	66	0	66
	16-2	8650 Winding Way	11:45AM	64	0	64
	16-3	8610 Winding Way	11:45AM	59	0	59
17	17-1	5206 Silver Spring Road	3:00PM	67	0	67
18	18-1	8900 Cowenton Road	2:00PM	69	0	69
19	19-1	8836 Cowenton Avenue	10:00AM	67	0	67
	19-2	8939 Cowenton Avenue	12:00PM	67	0	67
20	20-1	5323 Joppa Road	11:00AM	63	0	63
21	21-1	5423 Joppa Road	11:00AM	61	0	61
	21-2	11229 Lilac Lane	11:00AM	62	0	62
22	22-1	5501 Kathryns Court	3:00PM	66	0	66
	22-2	5212 Cobbler Court	3:00PM	68	0	68
23	23-1	5502 Madge Court	3:45PM	66	0	66
	23-2	5512 Madge Court	3:45PM	65	0	65
	23-3	5501 Lloyd Avenue	3:45PM	64	0	64
	23-4	18 Sylvania Mobile Park	11:00AM	60	0	60
	23-5	5501 New Forde Road	3:45PM	59	0	59
	23-6	5507 Madge Court	3:45PM	58	0	58

Noise levels approach or exceed impact criteria.

1. The peak hour adjustment factor was determined by the difference in noise levels between the peak hour and the actual measurement hour as identified by the 24-hour measurement.

2. Noise levels and adjustments were calculated to 0.1 decibel and then rounded to the nearest whole integer. Some minor differences in adjusted peak hour noise levels are due to rounding.

Noise Abatement Criteria: Noise Abatement Criteria (NAC) for various land uses have been established by the FHWA in Title 23 of the Code of Federal Regulations, Part 772 (23 CFR, Part 772) *Procedures for Abatement of Highway Traffic Noise and Construction Noise* and the Maryland State Highway Administration (SHA) *Sound Barrier Policy* (SHA, 1998). These categories and criteria are presented in ***Table III-14.*** The noise abatement criterion for most land uses occurring in the project study area (Category B) is 67 dBA Leq. However, Receptor 12-1 falls under Category C, which has a criterion of 75 dBA Leq.

According to the procedures described in 23 CFR, Part 772, noise impacts occur when predicted traffic noise levels for the design year approach or exceed the NAC prescribed for a particular land use category, or when the predicted noise levels are substantially higher than the existing ambient noise levels. The SHA *Sound Barrier Policy* defines the term "approaches" as 66 dBA for Category B and as 74 dBA for Category C, and defines a 10 dBA increase above existing noise levels as a substantial increase.

Existing Noise Impacts*:** As identified in ***Table III-13, existing noise levels at 13 NSAs (NSAs 7, 8, 9, 10, 11, 12, 14, 16, 17, 18, 19, 22 and 23) approach or exceed the Leq impact criterion (***Figure III-12***).

Table III-14. Noise Abatement Criteria (NAC), 23 CFR, Part 772: Hourly A-Weighted Sound Level in Decibels (dBA) *

Activity Category	L_{eq} (h)	L_{10}(h)	Description of Activity Category
A	57 (Exterior)	60 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	70 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	75 (Exterior)	Developed lands, properties or activities not included in Categories A or B above
D	--	--	Undeveloped lands
E	52 (Interior)	55 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

* Either L_{eq}(h) or L_{10}(h) (but not both) may be used on a project.

Note: These sound levels are only to be used to determine impact. These are the absolute levels where abatement must be considered. Noise abatement should be designed to achieve a substantial noise reduction - not the noise abatement criteria.

6. Existing Air Quality

The Clean Air Act regulates emissions of six criteria pollutants that pose a danger to human health and the environment. The six criteria pollutants are: lead, carbon dioxide, particulate matter, sulfur dioxide, nitrogen dioxide, and ozone. Under the Act, a system of health-based national ambient air quality standards, called "NAAQS" is established. Each NAAQS represents the amount of a particular pollutant that can be emitted into the ambient air, i.e., the air we breathe, without causing adverse health effects. Air quality control regions across the country are each given one of three designations: attainment, nonattainment, or maintenance.

The Section 100 study area is located within the Metropolitan Baltimore Intrastate Air Quality Control Region. The region is designated a maintenance area for carbon monoxide (CO) and an attainment area for the following pollutants: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter (PM_{10}). It is, however, designated as a severe non-attainment area for ozone (O_3). 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).

In addition, projects in maintenance and non-attainment areas are subject to the transportation conformity provisions of the Clean Air Act. Transportation conformity is the link between transportation planning and decision-making and the emissions budget. Conformity requires that transportation plans, programs, and projects in nonattainment and maintenance areas be demonstrated to "conform" to the mobile source emissions budgets in the SIP. Conformity is demonstrated based on the metropolitan constrained long-range plan (CLRP) and Transportation Improvement Program (TIP). In addition, projects located in CO maintenance or non-attainment areas are subject to micro-scale or "hot-spot" air quality analyses. FHWA cannot grant approvals or award funding for a project that has not been found to conform.

The Authority is currently coordinating with the Baltimore Metropolitan Council (BMC) regarding inclusion of the Section 100 project into the new cycle for the Baltimore Region TIP 2005-2009. Conformity determination for the 2005-2009 TIP is scheduled for July 2004. Section 100 is currently included in the 2001 Baltimore Regional Transportation Plan for illustrative purposes. It is anticipated that the Section 100 project will be included in the new long-range plan, Transportation 2030, which is scheduled for federal approvals in February 2005. The conformity status of the long range plan will be determined concurrently with the conformity for the TIP in July 2004. Upon inclusion in the regional TIP, the project will also be incorporated into the statewide State Implementation Plan (SIP).

A detailed micro-scale air quality analysis has been performed to determine the impact of each of the proposed Section 100 alternates on CO levels. The location of air quality sensitive receptors and the intersection analysis receptors (hot spots) used to assess each of the Build Alternates is shown on ***Figure III-12***, and summarized in ***Table III-15***.

Table III-15. Air Quality Receptor Locations

Receptor	Location	Description	Receptor	Location	Description
D-1	WB MD 43 @ Ramp G	Open Space	E-1	EB MD 43 @ Ramp C	Open Space
D-2	WB MD 43 @ Ramp G	Open Space	E-2	EB MD 43 @ Ramp C	Open Space
D-3	WB MD 43 @ Ramp G	Open Space	E-3	EB MD 43 @ Ramp C	Open Space
D-4	EB MD 43 @ Ramp G	Open Space	E-4	WB MD 43 @ Ramp C	Open Space
D-5	EB MD 43 @ Ramp G	Open Space	E-5	WB MD 43 @ Ramp C	Open Space
D-6	EB MD 43 @ Ramp G	Open Space	E-6	WB MD 43 @ Ramp C	Open Space
D-7	SB Ramp G @ MD 43	Open Space	E-7	NB Ramp C @ MD 43	Open Space
D-8	SB Ramp G @ MD 43	Open Space	E-8	NB Ramp C @ MD 43	Open Space
D-9	SB Ramp G @ MD 43	Open Space	E-9	NB Ramp C @ MD 43	Open Space
SR-1	62nd Street	Residential	SR-19	Pentecostal Holiness Church	Church
SR-2	62nd Street	Residential	SR-20	Meadow Branch Court	Residential
SR-3	62nd Street	Athletic Field	SR-21	Brushfield Road	Residential
SR-4	Hamilton Avenue	Residential	SR-22	Town & Country Apartments	Residential
SR-5	Langdon Lane	Church	SR-23	YMCA	Commercial
SR-6	Daybreak Estates	Residential	SR-24	Central Christian Academy	School
SR-7	Overlea High School	Athletic Field	SR-25	North of Rossville Boulevard	Open Space
SR-8	Kenwood Avenue	Residential	SR-26	North of Rossville Boulevard	Open Space
SR-9	East Avenue	Residential	SR-27	Campbell Boulevard	Open Space
SR-10	Trumps Mill Road	Residential	SR-28	Campbell Boulevard	Open Space
SR-11	Trumps Mill Road	Residential	SR-29	Quail Ridge Apartments	Residential
SR-12	Park East Apartments	Residential	SR-30	Lawrence Hill	Residential
SR-13	Kenwood Avenue	Residential	SR-31	Lawrence Hill	Residential
SR-14	Shandy Springs ES	Athletic Field	SR-32	White Marsh Childcare	Commercial
SR-15	Willow Hill	Residential	SR-33	Spring Road	Residential
SR-16	Willow Hill	Residential	SR-34	North of Joppa Road	Open Space
SR-17	Trumps Mill Road	Residential	SR-35	North of Joppa Road	Open Space
SR-18	Trumps Mill Road	Residential	SR-36	New Life Baptist Church	Church
SR = Sensitive Receptor		D and E = Hot Spot Location			

The analyses included predictions of CO concentrations at 36 sensitive receptor locations in the No-Build Alternate and the Managed Lanes Alternate. Eighteen additional receptor locations related to the proposed signals at the I-95/MD 43 Interchange were added to the General Purpose Lanes Alternate, for a total of 54 receptor locations for that Alternate.

The results of the air quality analysis are summarized in Chapter IV: *Environmental Consequences*. Additional details on air analyses can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Air Quality Technical Report* (Authority, 2004) prepared for this project.

F. Hazardous Materials

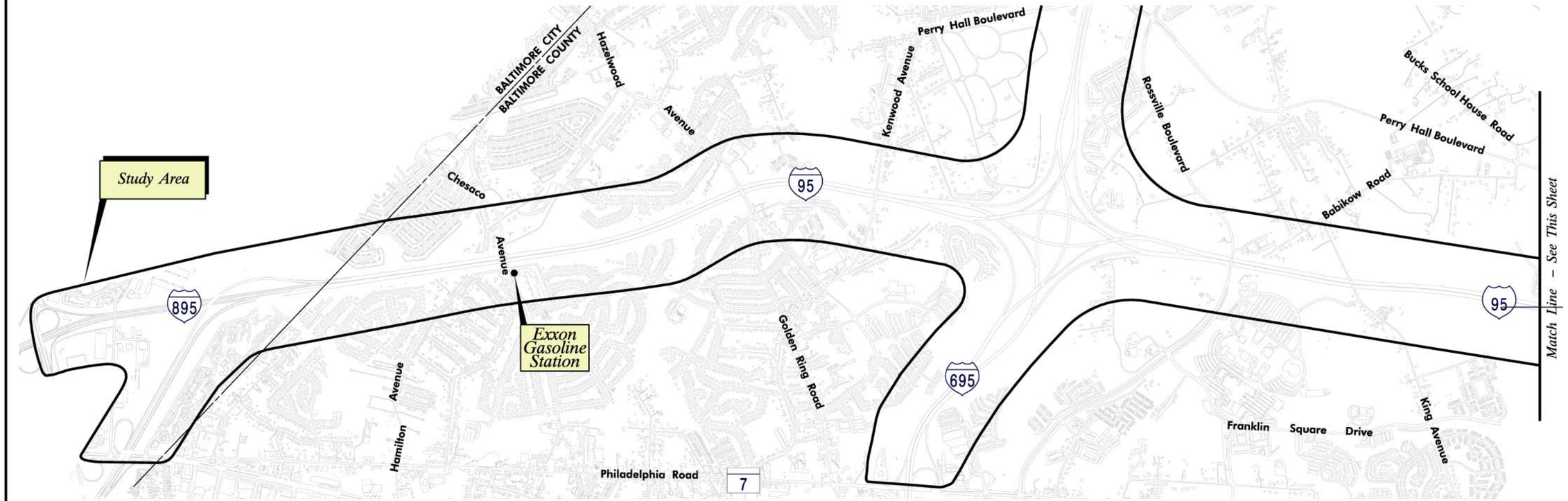
An *Initial Site Assessment* (ISA) Report (Authority, 2004) was prepared for the Section 100 Project. This report identified a total of 72 potential waste sites within and/or adjacent to the study area. Background research, including a database search of State and/or Federal waste site inventories, a file review at the Maryland Department of the Environment (MDE) and the Baltimore County Department of Environmental Protection and Resource Management (DEPRM), and a search of the EPA ENVIROFACTS website, was conducted for the study area.

Based on an environmental database search (InfoMap Technologies Inc/Environmental First), no Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) sites, CERCLIS No Further Remedial Action Planned (NFRAP), or Maryland Priorities List (SPL) sites were identified within the study area. Resource Conservation and Recovery Act Generator (RCRA-GEN), Emergency Response Notification System (ERNS), Solid Waste Landfill (SWL), Registered Underground Storage Tank/Aboveground Storage Tank (UST/AST) facilities, and Leaking Underground Storage Tank (LUST) facilities occur at various locations throughout the study area. A field reconnaissance was also conducted, which identified evidence of hazardous materials including fuel dispensers, 55-gallon drums, hydraulic equipment that could potentially contain polychlorinated biphenyls (PCBs), service garages, solid waste debris piles, ASTs, and USTs. Detailed results of the background research and field reconnaissance can be found in the ISA Report prepared for this project.

Of the 72 existing sites identified during the ISA, on-property or telephone interviews were conducted for several sites of concern in an attempt to gather additional information about the property. Each site in the ISA was assigned a potential contaminant value of high, medium, or low based on property operations, presence of USTs, and/or listing on the environmental database. Five sites within the study area are classified as having a high potential contaminant value: McCormick Place/Ayres Property (5200 McCormick

Avenue), Exxon gasoline station (1771 Chesaco Avenue), BP Express (5250 Campbell Boulevard), Honeygo Run Reclamation Center (10710 Philadelphia Road), and Trailer Park/Honeygo Run Reclamation Center (Polecat Lane/Silver Spring Road). Thirty-five sites with a medium potential contaminant value and 32 sites with a low potential contaminant value were also identified.

Depending on the project impacts to the five sites identified as high potential contaminate value, additional investigations on these properties may be necessary. ***Figure III-13*** illustrates the location of these five sites in relation to the study area. Chapter IV: *Environmental Consequences* details the results of the investigations and addresses recommendations for additional studies.



*McCormick Place /Ayres Property is discussed in the text but not shown on the map

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

FIGURE III–13
Potential Hazardous Waste Sites

Maryland Transportation Authority

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IV. ENVIRONMENTAL CONSEQUENCES

A. Social Impacts

This Section describes the impacts Section 100 improvements would have to the Social environment. This includes impacts to the population, communities, and community facilities and services. A summary of impacts is shown in ***Table IV-1.***

Table IV-1. Summary of Impacts

Resource	No-Build	General Purpose Lanes Alternate	Managed Lanes Alternate
Total Right-of-Way	0	60.2	90.1
Displacements			
Residential	0	2	5
Commercial	0	0	3
Outbuildings	0	5	5
Communities Affected	0	6	8
Community Facilities Affected	0	5	8
Local Businesses Affected	0	5	6

1. Property Displacements and Acquisitions

The purpose of this section is to describe impacts to properties that would result from the project alternates. These impacts include the acquisition of new right-of-way (ROW) for highway use and the displacement of structures. ***Table IV-2*** summarizes the property impacts for each alternate.

Table IV-2. Property Impacts

	No-Build Alternate	General Purpose Lanes Alternate *Appendix A*	Managed Lanes Alternate *Appendix B*
Total ROW (acres)	0	60.2	90.1
Displacements	0	2 residential (***Plate 7 and 11***) 5 outbuilding (***Plate 7 and 11***)	5 residential (***Plates 33, 36, and 37***) 3 commercial (***Plate 40***) 5 outbuildings (***Plates 33 and 37***)

a. No-Build Alternate

The No-Build Alternate would retain the existing I-95 highway and associated interchanges in their present configuration while allowing for routine maintenance and safety improvements. This alternate would not require the acquisition of additional ROW, resulting in no impacts to residential, commercial, or other structures.

b. General Purpose Lanes Alternate

The majority of the improvements associated with the General Purpose Lanes Alternate would be located within the Authority's existing ROW; however, this alternate would require the acquisition of approximately 60.2 acres of new ROW from multiple areas along the Section 100 corridor. In addition to right-of-way acquisition, this alternate would require the displacement of two residences and five residential outbuildings. One residential structure and one residential outbuilding would be displaced on the west side of I-95, just south of the I-695 Interchange along East Avenue (***Appendix A, Plate 7***). In addition, a residence and four associated residential outbuildings would be displaced in the northeast quadrant adjacent to the proposed ramp from westbound I-695 to northbound I-95 (***Appendix A, Plate 11***). All proposed ROW acquisitions and displacements are depicted on the detailed alternates mapping included in ***Appendix A (Plates 1 through 26)***.

In general, the areas where ROW would be acquired would be linear sections of land located adjacent to the Authority's existing ROW, with larger linear or polygonal sections for stormwater management (SWM) (***Appendix A, Plates 6 through 13, 16, 18, 20, and 22***). Most individual locations would be small slivers of either open space or woodlands. The largest of these areas are located in the vicinity of the I-695 and MD 43 Interchanges. ***Table IV-3*** provides a summary of the amount of land acquisition required from various land use types.

Table IV-3. Summary of Land Acquisition Required By Land Use Type

Land Use Type	Land Acquisition Required (acres)	
	General Purpose Lanes Alternate	Managed Lanes Alternate
Residential	15.47	26.41
Commercial	6.53	14.13
Other	38.2	49.58

c. Managed Lanes Alternate

While the majority of the improvements associated with the Managed Lanes Alternate would be located within the Authority's existing ROW; with approximately 90.1 acres of new ROW being acquired. In addition, five residences, three commercial structures, and five residential outbuildings would be displaced.

Two of the displaced residences and one associated residential outbuilding are located on the west side of I-95, just south of the I-695 Interchange along East Avenue (***Appendix B, Plate 33***). Two additional residential displacements would occur along eastbound I-695 just west of the I-95/I-695 Interchange (***Appendix B, Plate 36***). The fifth residential displacement, and four associated residential outbuildings would be displaced in the northeast quadrant of the I-95/I-695 Interchange (***Appendix B, Plate 37***). The three commercial structures that would be displaced are located on the Community College of Baltimore County – Essex Campus (***Appendix B, Plate 40***). Two of these buildings are trailers that appear to be used for storage associated with the maintenance facility. The third building is a house-like structure that does not appear to be in use. All three of these buildings are enclosed by fencing on the periphery of the campus.

Like the General Purpose Lanes Alternate, most ROW acquisitions would be linear sections of land adjacent to the Authority's existing ROW, with larger linear or polygonal sections for SWM (***Appendix B, Plates 32, 33, 35, 40, 41, and 44***). The largest areas of affected land would be in the vicinity of the I-695 and MD 43 Interchanges. ***Table IV-3*** provides a summary of the amount of land acquisition required from various land use types.

d. Mitigation

Fair market value would be provided to all property owners as compensation for land acquisition. In addition, landscaping opportunities could be considered to lessen the visual intrusion where appropriate. Relocation of any individuals, families, or businesses displaced by this project would be accomplished in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended by the Surface Transportation and Uniform Relocation Assistance Act of 1987. In the event that comparable replacement housing is not available for displaced persons or that available replacement housing is beyond their financial means, replacement housing as a last resort will be utilized to accomplish the rehousing.

2. Effects on Communities

This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.

Impacts to communities generally result from ROW acquisition, residential displacements, community bisection, altered access, increased noise levels, and/or decreased visual quality. The following discussion addresses potential impacts to communities within the study area.

a. No-Build Alternate

The No-Build Alternate would not directly affect any communities within the study area. There would be no acquisition of ROW, no displacement of residences, no community bisection, and no change in access. In addition, there would be no effect on noise levels or visual quality. However, as traffic volumes increase in the future, local communities could experience indirect impacts resulting from increases in traffic flow due to motorists seeking to avoid congestion and delays on I-95 by diverting to local roadways.

b. General Purpose Lanes Alternate

No substantial community impacts are expected to occur as a result of the General Purpose Lanes Alternate. However, small amounts of ROW would be acquired for this alternate, resulting in impacts to several residential communities including Daybreak Estates, Willow Hill, Towns Court Townhomes, Castle Stone at White Marsh, High Point Addition, and Castle Creek at White Marsh. ***Table IV-4*** provides a summary of the impacts to each of these communities. Additional information regarding community impacts is provided in the *Section 100: I-95, I-895(N) Split to North of MD 43 Socio-economic Technical Report* prepared for this project.

c. Managed Lanes Alternate

No substantial community impacts are anticipated to occur as a result of the Managed Lanes Alternate. This alternate would include ROW acquisition as well as noise and visual impacts within eight communities including Hamiltowne, Daybreak Estates, Kenwood Park, Willow Hill, and Castle Creek at White Marsh (***Appendix B, Plates 30, 32, 33, and 37***). ***Table IV-4*** provides a summary of the impacts to each of these communities.

3. Environmental Justice

This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.

Information gathered from Census 2000 data, the Baltimore County and City Offices of Planning, and the Baltimore County government website identified four potential environmental justice communities. These include: Fontana Village Townhomes, Garden Village Townhomes and Apartments, residences along Gilley Terrace, and residences adjacent to Lloyd Avenue. The following discussion addresses potential impacts of the proposed alternates on these communities.

Table IV-4. Summary of Affected Communities

		Community *							
Affect		**Daybreak Estates** [1] *(Appendix. A Plate 6 & Appendix B Plate 32)*	**Kenwood Park** [2] *(Appendix A Plate 7 &Appendix B Plate 33)*	**Towns Court Townhomes** [3] *(Appendix A Plate 13 & Appendix B Plate 39)*	**Castle Stone at White Marsh** *(Appendix A Plate 16 & Appendix B Plate 42)*	**Castle Creek at White Marsh** *(Appendix A Plate 16 & Appendix B Plate 42)*	**Hamiltowne** [4] *(Appendix B Plate 30)*	**Willow Hill**[5] *(Appendix B Plates 33/37)*	**Highpoint Addition**[6] *(Appendix A Plate 5 & Appendix B Plate 31)*
General Purpose Lanes Alternate	**ROW (acres)**	0.08	1.7	0.42	0.49	0.50	N/A	N/A	0.87
	Displacement	N	1 residential 1 outbuilding	N	N	N	N/A	N/A	N
	Access	N	N	N	N	N	N/A	N/A	N
	Noise Levels	Y	N	Y	Y	Y	N/A	N/A	N
	Visual Quality	Y	N	Y	Y	Y	N/A	N/A	N
Managed Lanes Alternate	**ROW (acres)**	0.15	2.3	0.42	1.0	1.9	0.12	0.31	0.87
	Displacement	N	2 residential 1 outbuilding	N	N	N	N	N	N
	Access	N	N	N	N	N	N	N	N
	Noise Levels	Y	Y	Y	Y	Y	Y	Y	N
	Visual Quality	Y	Y	Y	Y	Y	Y	Y	N

1. Homes affected are located at the northern end of Twilight Court.
2. Homes affected are located in the vicinity of East Avenue.
3. Homes affected are located at the northeastern end of Towns Court Lane.
4. Homes affected are located along Hamiltowne Circle.
5. Homes affected are located on the western side of Chriswell Court and Tarpleys Circle.
6. Homes affected are located on the northern end of Callo Lane.

* This table provides impacts for designated communities. Additional impacts to residences not located within a designated community are discussed in Chapter IV, Section A1.

a. No-Build Alternate

The No-Build Alternate would not result in disproportionately high impacts to any of the minority and/or low-income communities identified within the study area.

b. General Purpose Lanes Alternate

The General Purpose Lanes Alternate would not directly impact any of the communities identified as either minority or low-income. Two of these communities, *Fontana Village Townhomes* and the residences along *Gilley Terrace*, are located in close proximity to the I-95/I-695 Interchange but are not directly impacted (***Appendix A, Plates 10 and 13***). These communities would experience slight decreases in visual quality due to the proposed roadway improvements at this interchange. However, impacts at these communities would not be disproportionately high in comparison to impacts that would occur in other communities in the general vicinity of the I-95/I-695 Interchange.

c. Managed Lanes Alternate

Of the four identified minority communities within the study area, none would be directly impacted by the Managed Lanes Alternate. However, *Fontana Village* and residences along *Gilley Terrace* would experience visual quality impacts as a result of this alternate (***Appendix B, Plates 36 and 39***). The viewshed at these communities would be modified by the introduction of a new five-level interchange at I-695.

A forested buffer currently exists between *Fontana Village* and I-695 westbound. Encroachment upon this forested buffer would occur as a result of the roadway improvements proposed under the Managed Lanes Alternate. Although the neighboring highway and its modified interchange would be more visible to the residents of *Fontana Village* (***Appendix B, Plate 39***), these visual impacts would be commensurate with visual impacts to other communities in the vicinity of the I-95/I-695 Interchange, and therefore would not be disproportionately high or adverse.

Similar visual impacts would be experience at the homes along *Gilley Terrace*. These residential properties, though located further from the I-695 Interchange than *Fontana Village*, would still be affected. Residences along *Gilley Terrace* are located northeast of the I-95/I-695 Interchange (***Appendix B, Plate 36***). Although no ROW would be acquired in this community, the view from these residences would be altered by the introduction of the five-level interchange. These visual impacts would not be disproportionately high in comparison to visual impacts to other communities in the vicinity of the I-95/I-695 Interchange.

4. Effects on Community Facilities and Services

This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.

Effects on local community facilities are measured by direct impacts (acquisition of ROW) and indirect impacts (changes in access). Coordination with local emergency services has been undertaken to determine effects on response times. Additional details regarding effects to community facilities and services can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Socioeconomic Technical Report* prepared for this project. ***Table IV-5*** provides a summary of the impacts to community facilities and services for each alternate considered.

Table IV-5. Affected Community Facilities

		Community Facility							
Effect		**Hazelwood Baptist Church** *(Appendix A Plate 6 and Appendix B Plate 32)*	**Overlea High School** *(Appendix A Plate 7 and Appendix B Plate 33)*	**Baltimore County Community College – Essex Campus** *(Appendix A Plate 15, Appendix B Plates 40 and 41)*	**John Hopkins at White Marsh Hospital** *(Appendix A Plate 18 and Appendix B Plate 44)*	**Parkville YMCA** *(Appendix B Plate 35)*	**Central Christian Academy** *(Appendix B Plate 40)*	**Bouni Temple** *(Appendix B Plate 41)*	**McCormick Place Condominium Elderly Housing** *(Appendix A Plate 5 and Appendix B Plate 31)*
General Purpose Lanes Alternate	**ROW (acres)**	1.1	0.1	2.1	0.1	N/A	N/A	N/A	1.0
	Access	N	N	N	N	N/A	N/A	N/A	N
	Services	N	N	N	N	N/A	N/A	N/A	N
	Current Use	forested	forested	forested	forested	N/A	N/A	N/A	forested
Managed Lanes Alternate	**ROW (acres)**	0.6	0.6	2.3	0.9	0.14	0.09	0.27	1.0
	Access	N	N	N	N	N	N	N	N
	Services	N	N	N	N	N	N	N	N
	Current Use	forested	forested	forested	forested	forested	open	forested	forested

a. No-Build Alternate

The No-Build Alternate would not result in direct impacts to any community facilities. No ROW would be acquired and no facilities would be displaced. Furthermore, no changes in access would occur as a result of this alternate. Indirect impacts to emergency services, such as police, fire, and ambulance services, could occur as a result of increased traffic congestion, which is expected to occur in the future. These indirect impacts would include increased response times due to increased congestion and delays on I-95.

b. General Purpose Lanes Alternate

The General Purpose Lanes Alternate would result in only minor impacts to community facilities within the study area. Small amounts of ROW would be acquired near five facilities, including: the McCormick Place Condominium Elderly Housing, Hazelwood Baptist Church, Overlea High School, Baltimore County Community College - Essex Campus, and the John Hopkins at White Marsh Hospital. No facilities are located within the areas being acquired at any of these properties, therefore no impacts to the facilities or their operations are anticipated. In addition, the General Purpose Lanes Alternate would reduce traffic congestion, thereby improving emergency response times and access to existing facilities.

c. Managed Lanes Alternate

The Managed Lanes Alternate would result in only minor impacts to community facilities within the study area. Small amounts of ROW would be acquired from several facilities, including: McCormick Place Condominium Elderly Housing, Hazelwood Baptist Church, Overlea High School, Parkville YMCA, Central Christian Academy, Boumi Temple, Johns Hopkins at White Marsh Hospital and the Community College of Baltimore County - Essex Campus.

Three structures associated with community facilities would be impacted by this alternate, all of which are located at the Baltimore County Community College – Essex Campus. Two of these buildings are trailers that appear to be used for storage associated with the maintenance facility. The third building is a house-like structure that does not appear to be in use. All four of these buildings have been classified as commercial and are enclosed by fencing on the periphery of the campus. Adequate spacing is available on the campus to replace these structures, with minimal disruption to the College.

Land acquired from the remaining facilities would be sliver takes, and would not affect the operation or use of the facilities. In addition, the Managed Lanes Alternate would reduce traffic congestion, thereby improving emergency response times and access to existing facilities.

5. Effect on Visual Quality

Visual quality in the study area would vary between each alternate being considered. Effects on visual quality for each alternate in the design year of 2025 are described below.

a. No-Build Alternate

Under the No-Build Alternate, the general aesthetic would appear similar to what is seen today. Currently, there are views from the highway towards forests, open space, residential communities, and commercial areas. Some areas, particularly south of I-695, are lined with sound barriers that limit the viewshed within the highway corridor.

It is expected that additional urban development would occur along the highway corridor because the area is part of the Perry Hall - White Marsh Growth Area. This additional development would alter the visual landscape around the highway corridor by reducing the number of undeveloped parcels and increasing the amount of urban development, such as residential communities and commercial areas. It is expected that fewer forested tracts and open space would remain, and development would become denser.

b. General Purpose Lanes Alternate

The General Purpose Lanes Alternate would affect visual quality by introducing additional pavement and hardscape elements along the highway corridor. This would include expanded travel lanes, reduced median width, and new structures such as retaining walls, sound barriers, and bridges. There would be less greenery along the highway in medians and along roadsides. However, the overall visual appearance would still be consistent with the visual character of the interstate highway system as it currently exists.

The roadway width would change from eight lanes to twelve lanes, making the proposed highway approximately 48 feet wider than the existing highway. The added lanes would remove all existing green space in the median and extend into the roadsides. Some existing trees and roadside landscaping would be removed and some existing sound barriers would be relocated.

New highway structures would be visible along the corridor. The new interchange configuration at I-695 would include four levels (the existing interchange contains two level), and would increase the overall structure height by approximately 47 feet. The uppermost ramps and light fixtures would be more visible at a distance by motorists approaching the interchange on both I-95 and I-695 and by the surrounding communities. Additional sound barriers and landscaping would help visually buffer the interchange from the communities.

The MD 43 Interchange would not be as large as the interchange at I-695 because it would only have two levels, much like the existing interchange. The interchange would be a partial cloverleaf configuration allowing for large gores. Additionally, three of the four interchange quadrants would be more compact than the existing interchange.

Other structures along the corridor would include sound barriers and retaining walls. Some existing sound barriers would be relocated to locations either next to the roadside or on top of cut slopes. New sound barriers would also be located along the corridor in areas where they are warranted. Retaining walls would be located along the median in the northern portions of the study area due to highway bifurcation. Retaining walls might also be added along bridge abutments or along roadsides where cut and fill slopes would need to be minimized.

c. Managed Lanes Alternate

The Managed Lanes Alternate would affect visual quality in many of the same ways that the General Purpose Lanes Alternate would, but to a slightly greater extent because more width and structures would be needed. This 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.

The roadway width would change from eight lanes to twelve lanes plus additional shoulders for the managed lanes, making the highway approximately 64 feet wider than the existing roadway. The added lanes and shoulders would remove all existing green space in the median and extend into the roadsides. Most existing trees and roadside landscaping inside the ROW would be removed and some existing sound barriers would be relocated. 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.

New highway structures would be highly visible along the corridor. The new interchange configuration at I-695 would contain five levels, and would increase the overall structure height by approximately 112 feet. The two upper-most ramp levels and light fixtures would be more visible at a distance by motorists approaching the interchange on both I-95 and I-695 and by the surrounding communities.

The MD 43 Interchange would add two additional bridges over I-95, for a total of three overpass crossings. Other structures along the corridor would include sound barriers and retaining walls, which could be treated in the same way as described in the General Purpose Lanes Alternate. Existing sound barriers would be relocated to locations either next to the roadside or on top of cut slopes. New sound barriers would also be located along the corridor in areas where they are warranted. Retaining walls would be located along the median in the northern portions of the study area due to highway bifurcation. Retaining walls might also be added along bridge abutments or along roadsides where cut and fill slopes would need to be minimized.

B. Economic Impacts

1. Effects on Regional Business Activity

This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.

a. No-Build Alternate

The No-Build Alternate would not result in any immediate impacts to regional business activity. However, increasing traffic congestion, which would result from the projected increases in traffic volumes in the Section 100 corridor, could negatively affect businesses in the region. Because I-95 is a critical component of the regional transportation system, congestion-related delays could inhibit the productivity of many businesses, especially those that are highly dependent on the transportation system.

b. General Purpose Lanes Alternate

By providing additional roadway capacity along Section 100 of I-95, the transportation system would be capable of accommodating projected increases in traffic that are expected to occur in the region. As previously discussed, the addition of general purpose lanes would result in very little direct impacts to businesses in the region; therefore, no major commercial areas would be substantially affected. This alternate does not propose the addition, removal, or relocation of any access points on I-95. Therefore, no commercial trip patterns would be affected. By improving travel conditions along Section 100, access to planned commercial areas, such as the Middle River Employment Center (MREC), would be facilitated.

c. Managed Lanes Alternate

The Managed Lanes Alternate is similar to the General Purpose Lanes Alternate in that it would provide additional roadway capacity along Section 100 capable of accommodating projected increases in traffic. This alternate would also result in very little direct impact to businesses in the region. Although access points along Section 100 would not be

changed, the addition of managed lanes would result in a reconfiguration of the existing access points. This could have a slight impact on travel associated with regional business activity.

The Managed Lanes Alternate would operate at Level of Service (LOS) D or better in the managed lanes and LOS E or better in the general purpose lanes, thereby allowing at least two lanes to flow with minimal, if any congestion. Predictable travel times create advantages for transport fleets with schedules to meet such as those engaged in transit services or commercial "just in time" freight delivery services.

The Build Alternates would not displace or affect access to any commercial facilities that are currently in use. Therefore, these alternates would not have direct impacts on employment in the study area. However, by maintaining an acceptable LOS on at least two lanes in each direction on Section 100, these alternates would support planned commercial and industrial development in the vicinity of Section 100, thereby supporting employment growth in this area.

The success of a managed lane system hinges on a user's ability to consistently experience a predictable travel time and a facility operator's ability to consistently manage traffic volumes to provide the expected travel speed and travel time with a high degree of certainty. Based on this assessment, the Managed Lanes Alternate would best provide for intermodal access and priority trips, because it is anticipated that the managed lanes would operate at LOS D or better, thereby providing faster, more consistent travel conditions as compared to the General Purpose Lanes Alternate, which would operate at LOS E during weekday peak periods.

2. Effects on Local Businesses

a. No-Build Alternate

The No-Build Alternate would not directly impact any of the businesses located within the Section 100 study area. However, increased traffic congestion and delays associated with anticipated increases in traffic volumes along I-95 could indirectly affect local businesses. Congested roadway conditions could inhibit access to local businesses as well as delay the delivery of goods to and from these businesses.

b. General Purpose Lanes Alternate

The General Purpose Lanes Alternate would result in minimal impacts to local businesses. In general, there would be minor commercial ROW acquired (approximately 6.3 acres) but no commercial displacements. Since this alternate would involve the widening of an existing access-controlled highway and would not add or remove any interchanges, access to local businesses would not be altered. In addition, by improving traffic operations along I-95 through this corridor and reducing traffic congestion, access to local businesses would be improved.

Small areas of land would be acquired from the Randy's Landscaping site (located north of I-695 and west of Lillian Holt Drive) (***Appendix A, Plate 8***), a distribution center along eastbound Campbell Boulevard in the White Marsh Business Community (***Appendix A, Plate 18***), and at the Nottingham Square Shopping Center (***Appendix A, Plate 18***). No facilities/structures would be impacted at Randy's Landscaping or at the Nottingham Square Shopping Center; therefore no impacts are anticipated for these two businesses. Although a small number of parking spaces would be lost at the distribution center, the acquisition would not adversely affect the operation of the business since replacement parking could be provided within the open space area along the northern side of the existing parking lot.

c. Managed Lanes Alternate

The Managed Lanes Alternate would result in minor impacts to local businesses. In general, there would be a small amount of commercial ROW acquired (approximately 6.7 acres) and three commercial displacements located on the Baltimore County Community College – Essex Campus property (***Appendix B, Plate 40***). Two of these buildings are trailers that appear to be used for storage associated with the maintenance facility. The third building is a house-like structure that does not appear to be in use. All three of these buildings are enclosed by fencing on the periphery of the campus. It appears that there is adequate spacing on the campus to replace these structures, with minimal disruption to the College.

Since this alternate would also involve 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. In addition, by improving traffic operation along I-95 through this corridor and, therefore, reducing traffic congestion, access to local businesses would be improved.

The remainder of the commercial impacts would involve strips of land acquisition at the White Marsh Business Community (***Appendix B, Plate 44***), Nottingham Square Shopping Center (***Appendix B, Plate 44***), Randy's Landscaping (***Appendix B, Plate 34***), the Hilton Garden Inn (***Appendix B, Plate 44***), and Johns Hopkins at White Marsh Hospital (***Appendix B, Plate 44***). No facilities would be impacted at any of these locations.

3. Effects on Tax Base and Property Values

a. No-Build Alternate

The No-Build Alternate would have a negligible effect on the local tax base and local property values. Since there would be no roadway improvements and no property acquisitions, the tax base and property values would not be directly affected. As congestion levels increase over time and the general quality of life in the corridor is affected, the No-Build Alternate could potentially result in decreased property values within the study area.

b. General Purpose Lanes and Managed Lanes Alternates

Both Build Alternates would involve the acquisition of minor amounts of ROW from numerous residential and commercial properties. The acquisition of this land would slightly decrease the value of the properties from which they would be acquired by reducing their size. In addition, decreased property values resulting from the conversion of privately-owned residential, commercial, and other land to transportation use would also slightly decrease the local tax base. Local property taxes are applied based on the assessed value of the property. Therefore, if property values decrease, the revenue from property taxes would also decrease. The total amount of ROW that would be acquired under the General Purpose Lanes Alternate and the Managed Lanes Alternate (35.10 acres and 55.02 acres, respectively) would be insignificant in comparison to the amount of taxable land in the County and City in general. Therefore, the tax revenues lost as a result of either of these alternates would also be insignificant in comparison to the total property tax revenues generated by the County and City.

C. Land Use Impacts

This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.

1. No-Build Alternate

The No-Build Alternate would have no effect on land use within the study area. This alternate would not involve the direct conversion of any of the various land use types identified in the study area to transportation use. It would also have no effect on local development patterns.

2. General Purpose Lanes and Managed Lanes Alternates

Both Build Alternates would result in the conversion of 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. As previously stated, the purpose of Section 100 is to address capacity and safety needs on Section 100 and thereby improve access, mobility, and safety for local, regional and inter-regional traffic, including passenger, freight, and transit vehicles. Although capacity and safety are identified as the project needs, the extent, pace, and location of development growth along I-95, including Section 100, will be influenced and controlled by State and County land development policies and plans. Section 100 will accommodate future planned growth within the study area; however, future growth is not dependent on proposed improvements to Section 100. Therefore, it is anticipated that the overall land use in the study area would not be substantially affected. In addition, these alternates would not substantially affect local development patterns because they would

not result in new or modified access within the corridor. Section 100 is currently, and would remain, a fully access-controlled highway under both Build Alternates.

The Section 100 study area is located entirely within the State-certified Priority Funding Area (PFA) and is, therefore, consistent with the Smart Growth initiatives. Section 100 improvements assist in the goal to "develop long-term solutions to the complicated issues of economic growth, community revitalization, and resource conservation to achieve the best "public return" on State investments" in accordance with Executive Order 01.01.2003.33, Maryland's Priority Places Strategy.

D. Cultural Resource Impacts

Cultural resource studies/surveys for historic architectural resources and archaeological resources were conducted in consultation with the Maryland Historical Trust (MHT) and the State Historic Preservation Officer (SHPO), and in accordance with relevant State guidelines (viz. MHT 2000; Shaffer and Cole, 1994).

1. Historic Resources

Consulting parties were identified in December 2003, and coordination with those parties to identify historic resource information is ongoing. Studies were performed to identify historic resources and the alternates' potential effects on these resources. Resources and their effects were documented in the *Section 100: I-95, I-895(N) Split to North of MD 43 Historic Context and Determination of Eligibility and Effects Report* prepared for this project, which was concurred upon by the SHPO on XXX, 2004 (***Appendix C***).

As a result of the Section 100 study area investigations, one historic resource, located at 11204 Lilac Lane (BA-3141), was determined eligible for listing in the *National Register of Historic Places* (NRHP) under Criterion C (***Appendix C***). The residence at 11204 Lilac Lane is an example of a stone residence likely dating to the early-to-mid-nineteenth century. An increasingly rare building type in Baltimore County, particularly in northeastern Baltimore County, the house is constructed of irregularly coursed fieldstone. It retains a high degree of integrity although it has two small, unobtrusive additions, which do not alter the original historic fabric of the building. Unlike the majority of properties surveyed for the present project, 11204 Lilac Lane retains its integrity of setting. Additional details regarding this property, and others examined, can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Historic Context and Determination of Eligibility and Effects Report* prepared for this project.

An effect to this historic property would occur if there were an alteration of the characteristics qualifying it for inclusion in the NRHP. The residence at 11204 Lilac Lane is separated both visually and physically from I-95 by a substantial stand of trees. The property's integrity of setting is critical to its eligibility for listing in the NRHP. The property, including the house and grounds, would be unchanged by either of the proposed

Build Alternates, and no property would be acquired in the area surrounding the eligible property (***Appendix A, Plate 24 and Appendix B, Plate 50***). In all cases, the proposed roadway improvements would have No Effect on the character or use of the residence at 11204 Lilac Lane.

Additional details regarding the Effect Determination can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Historic Context and Determination of Eligibility and Effects Report* which was concurred upon by the SHPO (***Appendix C***).

2. Archaeological Resources

Studies were performed to identify archaeological resources and the alternates' potential effects on these resources. The findings of these studies were documented in the *Section 100: I-95, I-895(N) Split to North of MD 43 Phase I Archaeological Survey* prepared for this project, which was concurred upon by the SHPO on XXX, 2004 (***Appendix C***).

Phase I testing within the Area of Potential Effect (APE) identified one potentially significant archeological resource – the Smith Site (18BA516). This site is located in the southwestern quadrant of the I-695 Interchange on an upland landform adjacent to Stemmers Run. This site yielded 55 artifacts from a plowzone deposit. No diagnostic materials were recovered from the site, and it is consequently of unknown age. The deposits appear to have substantial horizontal integrity in that they are relatively tightly clustered within the site boundaries. The artifacts are predominantly made of one material (quartz), suggesting a limited number of occupations of the site. The site is considered to be potentially significant, warranting further investigation. This site would be acquired by the Managed Lanes Alternate. The General Purpose Lanes Alternate would not impact the Smith Site.

A Memorandum of Agreement (MOA) regarding the Smith Site has been prepared and approved by the SHPO and the Federal Highway Administration (FHWA) (***Appendix D***). The MOA describes steps to be taken to further evaluate the Smith Site (Phase II studies), as well the possible mitigation of effects to the site. Additional studies will be conducted during final design in accordance with the MOA. Additional details regarding archaeological studies and findings can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Phase I Archaeological Survey* prepared for this project.

E. Natural Environment Impacts

1. Topography and Geology

No impacts to geology are anticipated to occur for any of the alternates considered. Since the project would primarily involve roadway widening, impacts to topography would be minimal and would be most pronounced at the interchanges with elevation adjustments for aerial ramps and lanes.

2. Soils

a. No-Build Alternate

The No-Build Alternate would not expose soils, therefore no impacts would occur.

b. General Purpose Lanes and Managed Lanes Alternates

The Build Alternates would expose soils during the construction phase, thereby potentially resulting in soil erosion and subsequent sedimentation. Erosion and sedimentation would primarily be caused by removal of existing vegetation and placement of fill, leading to increased exposure of soils to weather and runoff potential. Eroded soils could be washed into nearby streams and wetlands, resulting in sedimentation. The areas with the highest potential for erosion and sedimentation would be the I-95/I-695 Interchange and I-95/MD 43 Interchange. These two areas would require relatively large amounts of earthwork to accommodate the proposed interchange improvements, thereby exposing the greatest amount of soil. However, Erosion and Sedimentation (E&S) Control Plans would be developed, approved, and implemented for these alternates prior to construction to avoid and/or minimize erosion and sedimentation impacts.

The most highly erodible soils (including moderately erodible to severely erodible) are included in ***Table IV-6*** and are depicted on ***Figure III-9***.

Table IV-6. Highly Erodible Soil Types

Soil Type	% Slope	Erodibility Classification
Sunnyside (fine sandy loam)	8-15	Moderately
Udorthents, loamy, very deep	15-60	Moderately
Sunnyside (fine sandy loam)	0-5	Moderately
Neshaminy silt loam	3-8	Moderately
Beltsville silt loam	5-10	Moderately
Joppa gravely sand loam	5-10	Moderately
Matapeake silt loam	5-12	Moderately
Christiana silt loam	5-10	Moderately
Legore silt loam	8-15	Severely
Aldino silt loam	3-8	Moderately

c. Minimization Measures

Several methods would be used in combination during construction to decrease erosion effects, including structural, vegetative, and operational methods. These control measures could include:

- Seeding, sodding, and stabilizing slopes as soon as possible to minimize the exposed area,
- Stabilizing ditches at the tops of cuts and at the bottoms of fill slopes before excavation and formation of embankments,
- Proper use of sediment traps, silt fences, slope drains, water holding areas, and other control measures, and
- Use of diversion dikes, mulches, netting, energy dissipaters, and other physical erosion controls on slopes where vegetation cannot be supported.

A grading plan and Erosion and Sedimentation (E&S) plan would be prepared and implemented prior to (and during) construction, in accordance with Maryland Department of the Environment (MDE) regulations. The grading plan and E&S plan would minimize the potential for impacts to water quality from erosion during pre-construction and post-construction activities. Measures to prevent erosion in highly susceptible areas (i.e. steep slopes) would be included in the grading and E&S plans as necessary. 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 and will be employed to reduce erosion and sedimentation.

In addition, The *2000 Maryland Stormwater Design Guidelines* would be used to determine the amount of SWM facilities necessary to properly control and treat stormwater runoff. Study points have been established at all locations where runoff or concentrated flow would leave the project site. This increase in impervious area could impact the waterways through increased erosion and sedimentation from exposure during construction, and as increased runoff once stabilized. Potential erosion from the increased runoff would be offset by SWM requirements. Best Management Practices (BMPs), as found in the *2000 Maryland SWM Design Manual* would be used throughout the project to reduce the impacts of erosion and sedimentation on wetlands and waterways. The impervious area for each alternate is listed in ***Table IV-7.***

Table IV-7. Estimated Proposed Impervious Area

3rd Order Watershed	Impervious Area					
	No-Build Alternate		General Purpose Lanes Alternate		Managed Lanes Alternate	
	Proposed New Impervious Area (acres)	Percent Increase Over Existing	Proposed New Impervious Area (acres)	Percent Increase Over Existing	Proposed New Impervious Area (acres)	Percent Increase Over Existing
Moores Run	0	0	36	10	49	50
Redhouse Creek	0	0	37	15	41	33
Stemmers Run	0	0	83	28	114	80
White Marsh Run	0	0	120	31	156	69
Bird River	0	0	21	57	22	60
Gunpowder River	0	0	19	38	18	30
Total	0	0	316	179	400	322

d. Prime Farmland Soils/Soils of Statewide Importance

None of the Build Alternates would affect Prime Farmland Soils or Soils of Statewide Importance. As previously discussed in Chapter III.E.2, Prime Farmland Soils and Soils of Statewide Importance located within the study area are exempt from Farmland Protection Policy Act (FPPA) coordination.

3. Water Resources

a. Water Quality

Water quality samples were tested for pollutants, nutrients, and biological parameters. The pollutants included the 13 metals identified in the Clean Water Act as Priority Pollutants. These were analyzed using the Environmental Protection Agency's (EPA) *Recommended Fresh Water Quality Criteria* (EPA 822-Z-99-001) and EPA Nutrient Guidance: Rivers and Streams (EPA, 2000). The following is a summary of the analyses, and the anticipated impacts to water quality from the Build Alternates (*details will be added upon receipt of water quality results).*

b. Waters of the United States (WUS)

Stream impacts associated with each of the alternates and individual impacts per 3rd order watershed for the Build Alternates are shown in ***Table IV-8***, and described in greater detail in the *Section 100: I-95, I-895(N) Split to North of MD 43 Natural Environment Technical Report* prepared for this project. (The State of Maryland separates its hydrologic divisions by a Hydrologic Unit Code (HUC). The state is divided into successively smaller hydrologic units that correspond to a designated number. As the divisions get smaller, the number gets larger. Watersheds have a 6 digit number; a subwatershed (8 digit) will have the same first six digits as its parent watershed and two more of its own. Third order watersheds are the smallest recognized hydrologic unit and have 12 digit numbers.)

No-Build Alternate: The No-Build Alternate would not impact WUS.

General Purpose Lanes Alternate: This alternate would expand I-95 from eight to twelve lanes. Culvert extensions and/or channel relocations would occur within the I-95/I-695 Interchange and along the I-95 and I-695 mainlines over Redhouse Creek, White Marsh Run, South Fork of White Marsh Run, and Honeygo Run. Permanent impacts to smaller waters would include channel relocations, culvert extensions, filling of waters, and piping of waters between existing culverts. The General Purpose Lanes Alternate would impact approximately 11,114 linear feet of WUS. ***Table IV-8*** provides a summary of WUS impacts per watershed.

Managed Lanes Alternate: This alternate would expand I-95 from eight to twelve lanes, and would include additional shoulders and barriers associated with the managed lanes. The Managed Lanes Alternate would have similar impacts to the General Purpose Lanes Alternate, but due to the added overall roadway width, would have slightly larger footprint impacts than the General Purpose Lanes Alternate, as shown in ***Table IV-8***. In addition, the Managed Lanes Alternate would result in impacts to the Bird River and Lower Gunpowder River 3rd Order Watersheds, which would not be impacted by the General Purpose Lanes Alternate. The Managed Lanes Alternate would impact approximately 15,956 linear feet of WUS. ***Table IV-7*** provides a summary of WUS impacts per watershed.

Table IV-8. Waters of the US Impact Summary

WUS Number	Cowardin Classification	Waters of the United States (WUS) Impacts (Linear Feet)					
		No-Build Alternate	General Purpose Lanes Alternate	Apdx. A Plate No.	Managed Lanes Alternate	Apdx. B Plate No.	Impact Type
Back River Sub-Watershed							
Redhouse Creek 3rd Order Watershed							
HRMR-WUS1	R3UB1	0	141	2	141	27	Stream shading
HRMR-WUS2	R3UB1	0	0	3	33	29	Culvert extension
HRMR-WUS7	R4UB2	0	0	3	61	29	Culvert extension
HRMR-WUS20	R4UB1	0	890	2	61	29	Channel relocation
HRRC-WUS1	R3UB1	0	54	6	230	32	Culvert extension
HRRC-WUS13	R4UB3	0	73	6	64	32	Total Fill
HRRC-WUS8	R4UB2	0	74	6	77	32	Culvert extension
HRRC-WUS7	R4UB1	0	255	6	248	32	Culvert extension
HRRC-WUS9	R4UB1	0	213	7	234	33	Culvert extension
HRRC-WUS12	R3UB1	0	0	4	93	33	Culvert extension
HRRC-WUS3	R4UB1	0	0	5	150	31	Culvert extension
HRRC-WUS10	R3UB1	0	0	5	24	31	Culvert extension
Perennial Stream Impacts		**0**	**229**		**379**		
Intermittent Stream Impacts		**0**	**1505**		**1724**		
Redhouse Creek Total		**0**	**1734**		**2103**		
Stemmers Run 3rd Order Watershed							
SRSR-WUS1	R3UB1	0	0	12	115	38	Culvert extension
SRSR-WUS16	R4UB1	0	0	7	28	33	Piped/Culvert Extension
SRSR-WUS18	R4UB2	0	290	7	296	33	Culvert extension
SRSR-WUS15	R3UB1	0	178	10	183	36	Culvert extension
SRSR-WUS15B	R3UB1	0	0	10	106	36	Culvert extension
SRSR-WUS19	R3UB1	0	36	10	41	36	Culvert extension
SRSR-WUS10	R3UB1	0	64	11	64	37	TBD
SRSR-WUS6	R3UB1	0	170	11	170	37	TBD
SRSR-WUS7	R3UB1	0	207	11	207	37	TBD
SRSR-WUS9	R3UB1	0	7	11	28	37	TBD
SRSR-WUS8	R3UB1	0	74	11	74	37	TBD
SRSR-WUS4	R3UB1	0	407	11	407	37	TBD
SRSR-WUS11	R4UB2	0	208	11	229	37	TBD
SRSR-WUS12	R4UB3	0	36	14	86	40	TBD
SRSR-WUS3	R3UB1	0	300	11	300	37	TBD
SRSR-WUS2	R3UB1	0	0	11	337	37	TBD
SRSR-WUS44	R4UB2	0	63	9	125	34	Culvert extension
SRSR-WUS20	R3UB1	0	0	10	232	36	Culvert extension
SRSR-WUS46	R4SB2	0	0	12	21	38	Culvert extension
SRSR-WUS13	R3UB2	0	0	12	21	38	TBD

Table IV-8. Waters of the US Impact Summary

WUS Number	Cowardin Classification	Waters of the United States (WUS) Impacts (Linear Feet)					
		No-Build Alternate	General Purpose Lanes Alternate	Apdx. A Plate No.	Managed Lanes Alternate	Apdx. B Plate No.	Impact Type
SRSR-WUS40	R3UB2	0	60	13	52	39	Culvert extension
SRSR-WUS41	R4UB2	0	858	13	856	39	Channel relocation
SRSR-WUS42	R4UB2	0	492	13	495	39	Channel relocation
SRSR-WUS22	R4UB3	0	0	12	100	38	Culvert extension
SRSR-WUS43	R3SB2	0	24	8	24	34	Culvert extension
SRSR-WUS17	R3UB1	0	16	12	0	38	Culvert extension
SRSR-WUS48	R4SB2	0	300	7	301	34	Culvert extension
SRSR-WUS14	R3UB1	0	216	12	216	38	TBD
Perennial Stream Impacts		**0**	**1759**		**2577**		
Intermittent Stream Impacts		**0**	**1947**		**2215**		
Stemmers Run Total		**0**	**3706**		**4793**		
Bird River Sub-Watershed							
White Marsh 3rd Order Watershed							
WMSF-WUS6	R3SB3	0	138	15	138	41	Culvert Extension
WMSF-WUS1	R3SB2	0	110	15	85	41	Culvert Extension
WMSF-WUS5	R4UB1	0	326	15	370	41	Channel relocation /Culvert Extension
WMSF-WUS9	R3SB2	0	81	15	70	41	Culvert Extension
WMSF-WUS15	R3SB2	0	40	16	96	42	Culvert Extension
WMSF-WUS2	R3SB3	0	0	15	18	41	Culvert Extension
WMMS-WUS23	EPHEMERAL	0	262	16	229	42	Total Fill
WMMS-WUS24	EPHEMERAL	0	89	16	89	42	Culvert Extension
WMMS-WUS1	EPHEMERAL	0	566	16	566	42	Culvert Extension
WMMS-WUS2	EPHEMERAL	0	400	16	400	42	Total Fill
WMMS-WUS12	R3SB2	0	72	16	100	42	Culvert Extension
WMMS-WUS22	R3SB2	0	84	16	81	42	Culvert Extension
WMMS-WUS25	EPHEMERAL	0	43	16	43	42	Total Fill
WMMS-WUS3	R3SB3	0	131	20	161	46	Piping Between Existing Culvert
WMMS-WUS4	R3SB3	0	131	20	161	46	Piping Between Existing Culvert
WMMS-WUS5	R3SB3	0	0	20	60	46	Total Fill
WMMS-WUS6	EPHEMERAL	0	568	20	568	46	Total Fill
WMMS-WUS7	R3SB3	0	235	20	235	46	Piping Between Existing Culvert
WMMS-WUS10	EPHEMERAL	0	426	20	430	46	Total Fill
WMMS-WUS11	EPHEMERAL	0	120	17	116	43	Culvert Extension
WMMS-WUS26	EPHEMERAL	0	96	18	96	44	Total Fill
WMMS-WUS27	R3SB2	0	66	18	135	44	Culvert Extension
WMMS-WUS28	R3SB3	0	27	17	69	43	Total Fill
WMMS-WUS29	EPHEMERAL	0	150	17	150	43	Culvert Extension

Table IV-8. Waters of the US Impact Summary

WUS Number	Cowardin Classification	Waters of the United States (WUS) Impacts (Linear Feet)					
		No-Build Alternate	General Purpose Lanes Alternate	Apdx. A Plate No.	Managed Lanes Alternate	Apdx. B Plate No.	Impact Type
WMMS-WUS31	R3SB2	0	47	18	102	44	Culvert Extension
WMMS-WUS32	EPHEMERAL	0	419	18	542	44	Total Fill
WMHG-WUS1	EPHEMERAL	0	111	22	306	48	Total Fill
WMHG-WUS2	EPHEMERAL	0	102	22	105	48	Total Fill
WMHG-WUS4	R3SB2	0	57	22	150	48	Culvert Extension
WMHG-WUS5	R3SB3	0	0	22	53	48	Partial Fill
WMHG-WUS6	EPHEMERAL	0	0	22	26	48	Total Fill
WMHG-WUS7	EPHEMERAL	0	500	22	500	48	Total Fill
WMHG-WUS8	EPHEMERAL	0	20	22	20	48	Culvert Extension
WMHG-WUS9	R3SB2	0	45	22	71	48	Culvert Extension
WMHG-WUS12	EPHEMERAL	0	85	22	0	48	Total Fill
WMHG-WUS13	R3SB3	0	50	22	0	48	Channel Relocation
Perennial Stream Impacts		**0**	**1391**		**1832**		
Intermittent Stream Impacts		**0**	**326**		**370**		
Ephemeral Stream Impacts		**0**	**3957**		**4186**		
White Marsh Total		**0**	**5674**		**6388**		
Bird River 3rd Order Watershed							
BRBR-WUS1	R3SB1	0	0	24	420	50	Channel Relocation
BRBR-WUS8	R3SB1	0	0	23	31	49	Culvert Extension
BRBR-WUS9	R3SB2	0	0	24	55	50	Culvert Extension
BRBR-WUS11	R3SB2	0	0	23	60	49	Culvert Extension
BRBR-WUS13	R4SB2	0	0	23	307	49	Total Fill
Perennial Stream Impacts		**0**	**0**		**566**		
Intermittent Stream Impacts		**0**	**0**		**307**		
Bird River Total		**0**	**0**		**873**		
Gunpowder River Sub-Watershed							
Lower Gunpowder River3rd Order Watershed							
GPJR-WUS1	R3SB2	0	0	25	1266	51	Total Fill
GPJR-WUS2	R4SB2	0	0	25	127	51	Total Fill
GPJR-WUS4	R3SB2	0	0	25	407	51	Total Fill
Perennial Stream Impacts		**0**	**0**		**1673**		
Intermittent Stream Impacts		**0**	**0**		**127**		
Lower Gunpowder River Total		**0**	**0**		**1800**		
Perennial Stream Impacts Per Alternate		**0**	**3379**		**7027**		
Intermittent Stream Impacts Per Alternate		**0**	**3778**		**5143**		
Ephemeral Stream Impacts Per Alternate		**0**	**3957**		**4186**		
Total WUS Impact Per Alternate		**0**	**11114**		**15956**		

Stream Quality Impacts: Several stream crossings would be required for each Build Alternate, thereby resulting in stream impacts. Stream impacts would range from approximately 11,100 to 16,000 linear feet depending on the alternate. The nature of these impacts would primarily include culvert extensions, channel relocations, filling of waters, or piping of waters between existing culverts.

Streams within the Section 100 study area are within either Use I or Use IV stream classifications, as defined by the Code of Maryland Regulations (COMAR) 26.08.02.03. The majority of stream impacts would occur within Use I waters. Use I water quality standards are the least stringent of the four classifications, meaning that these waters typically do not provide pristine aquatic habitat as compared to the other use classifications. Use I waters are mainly protected for the purposes of maintaining water contact recreation and protection of aquatic life. This project would also impact Use IV waters, which are typically considered higher quality waters. Overall, stream impacts would range from intermittent to perennial systems, and the quality of individual systems would range from roadside drainage ditches to perennial, higher functioning systems. Although roadside drainage ditches are often considered lower-functioning systems, they do provide an important function in capturing roadside runoff.

Avoidance/Minimization **-** As this project progresses into final design, avoidance and minimization measures will be further evaluated. Minimization efforts for WUS involve both direct and indirect impact effects. Minimization of direct effects on waters may include the use of steeper roadway embankments and perpendicular crossings to minimize the footprint and the use of bridges versus closed systems (i.e., culverts). Indirect effects, which would be considered in the minimization design efforts, would 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. Other minimization efforts may include retaining or adding riparian buffers as well as fish passage through structures.

c. Wild and Scenic Rivers

There are no Wild and Scenic Rivers, or their tributaries, located within the study area. Therefore, no Wild or Scenic Rivers would be impacted by any of the alternates considered.

d. Water Supply/Groundwater

The public drinking water supply would not be adversely affected by any of the alternates considered. As described in Chapter III.E.3.e, the abandoned Whippoorwill trailer park was the only location receiving water from groundwater wells. No adverse effects would be anticipated to the public water supply within the study area. Impacts to groundwater from construction activities and the permanent roadway would be kept to a minimum by implementing BMPs.

e. Floodplains

The 100-year floodplains have been delineated using the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps and floodplain studies conducted by Baltimore County. The study area lies within the 3rd order sub-watershed drainage areas of Moores Run, Redhouse Creek, Stemmers Run, White Marsh Run, Honeygo Run and Lower Gunpowder. The Build Alternates are located in these watersheds within the FEMA designated 100-year floodplain.

Existing culverts, culvert extensions, and new culverts associated with these improvements would require hydraulic evaluations to verify potential impacts to flooding. The natural and beneficial floodplain values of Moores Run, Redhouse Creek, Stemmers Run, White Marsh Run, Honeygo Run and Lower Gunpowder and its tributaries would likely be impacted in locations where the Build Alternates would fill and/or narrow the floodway and 100-year floodplain. The area of 100-year floodplain impacted by each alternate is summarized in ***Table IV-9***, including a breakdown of impact to 100-year floodplains in each of the watersheds in the study area. It should be noted that impacts as cited do not necessarily equate to a proposed "fill" activity; but rather represent a "disturbance", which may include grading abandoned road/ramp segments, pier placement, or other activities within the floodplain.

Table IV-9. Impacts to Floodplains

3rd Order Watershed	Floodplains	Floodplain Impacts (acres)				
		No-Build Alternate	General Purpose Lanes Alternate	Apdx. A Plate No.	Managed Lanes Alternate	Apdx. B Plate No.
Redhouse Creek	Moores Run	0	0.36	1-3	0.64	27-29
	Redhouse Creek	0	0.51	6	0.92	32
Stemmers Run	Stemmers Run	0	33.63	8-13	36.16	34-39
White Marsh	White Marsh Run	0	4.19	18, 19, 21	5.44	44, 45, 47
White Marsh	Honeygo Run	0	0.70	22	1.75	48
Lower Gunpowder	Gunpowder	0	0	26	0	52
Total		**0**	**39.39**	**N/A**	**44.91**	**N/A**

The majority of floodplain impacts for each Build Alternate would be transverse. Longitudinal floodplain impacts would only occur in three areas. The first longitudinal impact area would be located just south of the Hazelwood Avenue overpass, along Redhouse Creek (***Appendix A Plate 6 and Appendix B Plate 32***). The second area would occur along eastbound I-695, approximately 500 feet west of Lillian Holt Drive, within the Stemmers Run floodplain (***Appendix A Plate 8 and Appendix B Plate 34***). The third area would be within the I-695 Interchange (***Appendix A Plate 11 and Appendix B Plate 37***). Due to the nature of the I-695 Interchange, calculations of longitudinal and transverse floodplain impacts cannot be separated. The proposed project was evaluated with respect to potential impacts on regulated floodplains. The following is a summary of those impacts.

No-Build Alternate: The No-Build Alternate would have no impacts to the 100-year floodplain in any of the watersheds.

General Purpose Lanes Alternate: The General Purpose Lanes Alternate would impact approximately 39 acres of floodplains in the study area (***Table IV-9***). This would include approximately 0.3 acre of longitudinal impacts (approximately 0.27 acre occurring at Station 210 and approximately 0.05 acre occurring near Lillian Holt Drive along Stemmers Run), a combination of longitudinal and transverse impacts totaling approximately 33.6 acres within the I-695 Interchange, and approximately 5.1 acres of additional transverse impacts. This alternate would require five encroachments that would bisect the 100-year floodplains. These would occur at Redhouse Creek, Stemmers Run, White Marsh Run, and Honeygo Run. I-95 would be widened from four to six lanes in each direction, which would require fill to accommodate widening of lanes. Impacts to flood storage would result from direct placement of fill for the lane additions and culvert extensions.

Managed Lanes Alternate: The proposed Managed Lanes Alternate would impact approximately 45 acres of floodplains in the study area. This would include approximately 0.75 acre of longitudinal impacts (approximately 0.7 acre occurring at Station 210 and approximately 0.05 acre occurring near Lillian Holt Drive along Stemmers Run), a combination of longitudinal and transverse impacts totaling approximately 36.2 acres within the I-695 Interchange, and approximately 8.0 acres of additional transverse impacts. I-95 would be expanded from four to six lanes in each direction, but the width of I-95 would increase (compared to that of the General Purpose Lanes Alternate) due to the proposed spacing of the new managed lanes and the associated barriers and shoulders needed to accommodate those lanes. The floodplain encroachments for this alternate would be located in the same watersheds/floodplains as those described in the General Purpose Lanes Alternate section above.

Avoidance/Minimization - Floodplain encroachments would require detailed hydrology and hydraulics analysis to assure minimal floodplain impacts. Avoidance and minimization efforts to impacted 100-year floodplains would continue throughout the planning and engineering process. These efforts could include reducing encroachments by increasing the steepness of fill slopes and/or incorporating retaining walls.

4. Ecological Impacts

a. Terrestrial/Wildlife Habitat

Habitat types within the study area were classified using a variation of the Anderson Land Use classification system, and primarily fell under industrial, commercial, residential, and woodlands. Industrial and commercial areas were classified together for the purpose of terrestrial habitat classification, since both are areas dominated by rooftops or parking lots with very sparse groups of landscaping and maintained lawns. The industrial/commercial habitat type provides little habitat for wildlife. Impacts to small amounts of industrial/commercial area would occur for both Build Alternates, primarily due to the widening required at improved interchanges. However, these areas currently provide little wildlife habitat, therefore impacts would be minimal in these areas.

Residential land use offers slightly better habitat than industrial/commercial areas because it has less impervious area, and usually offers more trees and landscaping that have food value to wildlife. Impacts to small amounts of residential area would occur with both Build Alternates, primarily due to the widening and additional ramps required at improved interchanges. However, effects to terrestrial habitat would be minimal in these areas.

General impacts to woodlands would involve the conversion of habitat to impervious road and associated infrastructure (***Table IV-10***). Since the Build Alternates generally involve widening the existing roadway alignments, the majority of the habitat affected would involve maintained grassy strips or narrow rows of trees along the existing roadside.

No-Build Alternate: Woodlands would not be impacted by the No-Build Alternate.

General Purpose Lanes Alternate: The majority of woodland impacts would occur as a result of improvements to the I-95/I-695 and I-95/MD 43 Interchanges. To maintain traffic during construction and provide onsite staging areas and/or temporary roadways during different phases of construction, all of the woodlands within the immediate vicinity of the I-95/I-695 Interchange have been considered permanently impacted. These impacts may be minimized during final engineering design and construction. Exact locations and acreage of woodland impacts would be better defined during final design, at which time coordination with Maryland Department of Natural Resources (DNR) would be undertaken to obtain necessary tree permits.

Table IV-10. Woodland Impacts

Impacts to Woodlands Per Watershed			
Sub-Watershed	**Alternate (acre)**		
	No-Build Alternate	**General Purpose Lanes Alternate**	**Managed Lanes Alternate**
Moores Run	0	7.86	18.23
Redhouse Creek	0	9.64	12.32
Stemmers Run	0	65.91	80.75
White Marsh Run	0	61.60	80.81
Bird River	0	6.21	14.81
Gunpowder River	0	4.49	5.28
Total	**0**	**155.71**	**212.20**
Impacts to Woodlands Per Forest Type			
Forest Type	**Alternate (acre)**		
	No-Build Alternate	**General Purpose Lanes Alternate**	**Managed Lanes Alternate**
Sycamore, Green Ash, Box Elder and Silver Maple Association	0	4.73	6.82
Tulip Poplar Association	0	3.32	7.54
Undetermined Mixed Succession and Disturbed Areas	0	147.67	196.20
Total	**0**	**155.72**	**210.56**

***Managed Lanes Alternate*:** The proposed I-895 northbound span over Moores Run and I-95 would impact a forested area east of the existing interchange. Widening I-95 would impact existing forest edge and create new forest edge, thereby reducing or eliminating a shallow wooded buffer between I-95 and adjacent communities. This alternate would have increased impacts to the tulip poplar forest types (as compared to the General Purpose Lanes Alternate) because the additional widening of I-95 for the managed lanes and their associated barriers and shoulders would leave little room for SWM BMPs in non-forested areas. Exact locations and acreage of woodland impacts would be better defined during final design, at which time coordination with DNR would be undertaken to obtain necessary tree permits.

Minimization: This project would adhere to applicable laws and regulations which require that impacts be minimized. Per Natural Resources Article 5-103, *Reforestation Law*, adopted 1989, amended 1990 and 1991, the construction of a highway by a unit of the State:

- May cut or clear only the minimum number of trees and other woody plants that are necessary and consistent with sound design practices, and
- Shall make every reasonable effort to minimize the cutting or clearing of trees and other woody plants.

The Maryland Reforestation Act requires the minimizing of forest clearing, replacement of removed wooded areas, or contributions to a reforestation fund if forested areas are taken. Both of the Build Alternates would comply with the Maryland Reforestation Act. All highway construction projects utilizing one dollar or more of State funding must perform mitigation for forest impacts. Forest mitigation is required for any State project that requires one or more acre of impact. Replacement is required on an acre-for-acre (1:1) basis and must be accomplished on public land.

Forest Interior Dwelling Species (FIDS):

No-Build Alternate:
The No-Build Alternate would have no impacts on FIDS habitat within the study area.

General Purpose Lanes and Managed Lanes Alternates:
The General Purpose Lanes Alternate would impact approximately 2.66 acres of FIDS habitat within the study area due to the placement of SWM facilities. These facilities would be located adjacent to the roadway embankment within several wooded areas of the Bird River 3rd Order Watershed, thereby impacting FIDS habitat (***Appendix A, Plates 23 and 24***). The Managed Lanes Alternate would impact approximately 6.31 acres of FIDS habitat within similar locations as the General Purpose Lanes Alternate. However, because this alternate would require a slightly larger footprint, placement of the SWM facilities would acquire additional FIDS areas compared to the General Purpose Lanes Alternate (***Appendix B, Plates 49 and 50***).

Minimization:
The Authority would make every possible effort to avoid/minimize project impacts to FIDS habitat and other native forest plants and wildlife. Minimization measures could include the following:

- Avoid placement of new roads or related construction in the forest interior. If unavoidable, restrict development to the perimeter of the forest.
- Do not remove or disturb forest habitat from May through August, which is the breeding season for most FIDS. This seasonal restriction may be extended to February through August if certain early nesting FIDS (ex, Barred Owl) are present,

- Maintain forest habitat as close as possible to the road, and maintain canopy closure where possible, and
- Maintain grass height of at least ten inches during the breeding season (May-August).

Large/Significant Trees: Impacts to large and significant trees were determined by calculating the percent of critical root zone affected by each proposed alternate. When more than 30 percent of the critical root zone would be disturbed, the tree would be considered a total take, with the exception of tulip poplars (*Liriodenron tulipifera*). Tulip poplars have an extremely sensitive root system and any impact, especially soil compaction, significantly weakens the health of the tree. Therefore any impact to the critical root zone of a tulip poplar was considered a total take. A summary of impacts to large and significant trees is shown in ***Table IV-11.***

Through further planning and design, and construction phases of this project, the effects of disturbance to some species of trees or individual trees may change. Where changes occur, some trees may no longer remain suitable for retention at the Limit of Disturbance (LOD) boundary due to effects from soil and root compaction, root injury, limb or trunk injury, altered hydrology, disease, susceptibility to windthrow, and sunscald.

No-Build Alternate:
The No-Build Alternate would not impact any large or significant trees within the study area.

General Purpose Lanes Alternate:
The widening of the I-95 mainline would remove tree #50 (Sta. 221+00), #49 (Sta. 225+00) and #63 (Sta. 330+00), and would impact the critical root zone of tree #61 and #62 (Sta. 330+00) (***Appendix A, Plates 4, 6, 7, 11, and 5 respectively***). The widening of I-695 would remove tree #53 (located 2,200 feet east of Lillian Holt Drive, north of I-695), #59 (located 2,000 feet east of Lillian Holt Drive, south of I-695), #77 (located 1,300 feet east of Lillian Holt Drive off east of eastbound I-695, along Stemmers Run), and #78 (located 1,200 feet east of Lillian Holt Drive off of eastbound I-695, along Stemmers Run), and would impact the critical root zone of tree #57 (located 2,000 feet east of Lillian Holt Drive, north of I-695) (***Appendix A, Plates 4, 8, and 15 respectively***).

Table IV-11. Impacts to Large and Significant Trees

Tree #	Tree Species		Impact to Critical Root Zone (Percent)				
	Common Name	Scientific Name	No Build Alternate	General Purpose Lanes Alternate	Removed or Impacted	Managed Lanes Alternate	Removed or Impacted
50	Southern red oak	*Quercus flacata*	0	60	Removed	60	Removed
49	Chestnut oak	*Quercus montana*	0	50	Removed	60	Removed
53	Red oak	*Quercus rubra*	0	30	Impacted	30	Removed
57	White oak	*Quercus alba*	0	20	Impacted	60	Removed
59	Southern red oak	*Quercus flacata*	0	40	Removed	30	Removed
60	Southern red oak	*Quercus flacata*	0	0	-	50	Removed
61	Black willow	*Salix nigra*	0	5	Impacted	5	Impacted
62	Black willow	*Salix nigra*	0	15	Impacted	40	Removed
63	Silver maple	*Acer saccharinum*	0	95	Removed	100	Removed
77	Yellow poplar	*Liriodendron tulipifera*	0	5	Removal	5	Removal
78	Yellow poplar	*Liriodendron tulipifera*	0	15	Removal	15	Removal

Managed Lanes Alternate:

The Managed Lanes Alternate and the General Purpose Lanes Alternate would have the same impacts to tree #50, #49, #59, #61 #63, #77 and #78 (***Appendix B, Plates 30, 32, 34, 37, and 33 respectively***). However, the Managed Lanes Alternate would remove tree #57, #53, #60, and #62 (as opposed to the General Purpose Lanes Alternate, which would not impact tree #60 at all, and would only impact, rather than remove tree #57, #53, and #62) (***Appendix B, Plates 41, 30, and 31 respectively***).

Secondary Impacts:

Secondary impacts to large and significant trees would include changes in exposure to sunlight, wind, precipitation, road salt, biological competition from adjacent disturbed area, as well as changes in the hydrological regime of the area surrounding these trees. These secondary impacts could affect the long-term welfare of these trees, but would not influence short-term survival.

b. Aquatic Habitat

No-Build Alternate: This alternate would not impact aquatic habitat in the study area.

Build Alternates: Construction impacts from the Build Alternates could temporarily affect macro-invertebrate and fish populations due to increased sediment loads entering the streams. Excessive sediment can reduce the available substrate for benthic colonization and fish refuge. Assemblages of pollution tolerant species are currently found in the streams within the study area. It is anticipated that most of the in-stream biologic communities would tolerate the temporary impacts of bridge widening(s) and other in-stream construction. Sediment loading would be minimized with the implementation of the E&S controls and SWM facilities. Additional details can be found in the *Section 100: I-95, I-895(N) Split to North of MD 43 Natural Environment Technical Report* prepared for this project.

More information will be added once water quality analyses and data become available.

c. Wetlands

Wetland impacts associated with each of the alternates and individual wetland impacts per 3rd order watershed for the Build Alternates are shown in ***Table IV-12***, and are described in greater detail in the *Section 100: I-95, I-895(N) Split to North of MD 43 Natural Environment Technical Report* prepared for this project.

No-Build Alternate: This alternate would have no impacts to wetlands located in the study area.

General Purpose Lanes Alternate: The majority of wetland impacts cause by this alternate would occur from widening the mainline of I-95, and improvements to the I-95/I-695 Interchange (***Table IV-12***). 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. No other impacts to wetlands would occur within the Gunpowder River 3rd Order Watershed. 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. The primary function of all of these wetlands is sediment and toxicant retention, which would be compensated for through BMPs, wetland mitigation, and SWM facilities. Total wetland impacts for the General Purpose Lanes Alternate would be approximately 5.09 acres.

Table IV-12. Wetland Impact Summary

Wetland Number	Cowardin Classification	Wetland Impacts (acres)					
		No-Build Alternate	General Purpose Lanes Alternate	Apdx. A Plate No.	Managed Lanes Alternate	Apdx B Plate No.	Impact Type
Back River Sub-Watershed							
Redhouse Creek 3rd Order Watershed							
HRMR-WET2	PEM1	0	0.046	3	0.046	29	Fill
HRMR-WET3	PEM1	0	0	4	0.004	30	Fill
HRMR-WET4	PEM1	0	0	4	0.006	30	Fill
HRMR-WET6	PEM1	0	0	3,4	0.049	29	Fill
HRRC-WET11	PEM1	0	0.09	6	0.044	32	Fill
HRRC-WET1	PEM1	0	0	4	0.011	30	Fill
HRRC-WET8	PEM1	0	0	5	0.10	31	Fill
Red House Creek Total		**0**	**0.136**		**0.260**		
Stemmers Run 3rd Order Watershed							
SRSR-WET2	PSS1	0	0.42	12	0.42	38	TBD
SRSR-WET9	PEM1	0	0.065	10	0.065	36	TBD
SRSR-WET17	PEM1	0	0.090	11	0.090	37	TBD
SRSR-WET16	PEM1	0	0.022	11	0.022	37	TBD
SRSR-WET18	PEM1	0	0.012	11	0.012	37	TBD
SRSR-WET6	PFO1	0	0.073	11	0.072	37	TBD
SRSR-WET7	PEM1	0	0.456	11	0.456	37	TBD
SRSR-WET13	PSS1	0	0.077	11	0.078	37	TBD
SRSR-WET15	PEM1	0	0.024	11	0.023	37	TBD
SRSR-WET12	PSS1	0	0.062	11	0.061	37	TBD
SRSR-WET11	PSS1	0	0.176	11	0.178	37	TBD
SRSR-WET8	PEM1	0	0.082	11	0.084	37	TBD
SRSR-WET1	PEM1	0	0.322	11	0.322	37	TBD
SRSR-WET10	PFO1	0	0.019	11	0.018	37	TBD
SRSR-WET3	PEM1	0	0.465	12	0.464	38	TBD
SRSR-WET26	PFO1	0	0.016	10	0.016	36	Fill
SRSR-WET25	PFO1	0	0.012	12	0	38	Partially Filled-General Purpose
SRSR-WET21	PFO1	0	0	10	0.035	36	Fill
SRSR-WET50	PEM1	0	0.057	10	0.057	36	Partial Fill
SRSR-WET19	PFO1	0	0	10	0.035	36	Fill
Stemmers Run Total		**0**	**2.45**		**2.508**		

Table IV-12. Wetland Impact Summary

Wetland Number	Cowardin Classification	Wetland Impacts (acres)					
		No-Build Alternate	General Purpose Lanes Alternate	Apdx. A Plate No.	Managed Lanes Alternate	Apdx B Plate No.	Impact Type
Bird River Sub-Watershed							
White Marsh 3rd Order Watershed							
WMSF-WET1	PFO1	0	0.094	15	0.092	41	Fill
WMSF-WET3	PFO1	0	0.014	16	0.014	42	Partial Fill
WMSF-WET4	PEM1	0	0.182	16	0.182	42	Fill
WMMS-WET1	PEM1	0	0.007	16	0.007	42	Fill
WMMS-WET2	PEM1	0	0.006	16	0.006	42	Fill
WMMS-WET3	PEM1	0	0.024	18	0.024	44	Total Fill
WMMS-WET4	PFO1	0	0.034	20	0.034	46	Total Fill
WMMS-WET5	PFO1	0	0.009	20	0	46	Total Fill
WMMS-WET7	PFO1	0	0	20	0.117	46	Total Fill
WMMS-WET11	PEM1	0	0.30	18	0.30	44	Total Fill
WMMS-WET14	POW1	0	0.799	18	0.799	44	Total Fill
WMHG-WET9	PFO1	0	0	22	0.001	48	Total Fill
WMHG-WET3	PEM1	0	0.089	22	0.32	48	Partial Fill
WMHG-WET4	PEM1	0	0.183	22	0.355	48	Total Fill
White Marsh Total		**0**	**1.647**		**2.251**		
Bird River 3rd Order Watershed							
BRIS-WET3	PEM1	0	0.015	23	0.015	49	Total Fill
BRBR-WET5	PFO1	0	0.024	24	0.003	50	Total Fill
BRBR-WET6	PFO1	0	0	23	0.05	49	Total Fill
Bird River Total		**0**	**0.039**		**0.068**		
Gunpowder River Sub-Watershed							
Lower Gunpowder River 3rd Order Watershed							
GPJR-WET4	PEM1	0	0	24	0.43	50	Total Fill
GPJR-WET5	PFO1	0	0	---	0.024	---	Total Fill
GPJR-WET6	PFO1	0	0.099	24	0.099	50	Total Fill
GPJR-WET7	PEM1	0	0.393	25	0.393	51	Total Fill
GPJR-WET8	PFO1	0	0.328	25	0.328	51	Total Fill
Lower Gunpowder River Total		**0**	**0.82**		**1.274**		
Total Wetland Impact Per Alternate		**0**	**5.092**		**6.361**		

The majority of impacts to wetland within the Stemmers Run 3rd Order Watershed would occur within the I-95/I-695 Interchange. To maintain traffic during construction and provide onsite staging areas and/or temporary roadways during different phases of construction, all of the wetland systems within the immediate vicinity of the I-95/I-695 Interchange have been considered as permanent impacts. These impacts may be minimized during final design.

Managed Lanes Alternate: The majority of wetland impacts caused by this alternate would occur from the widening of the I-95 mainline and improvements to the I-95/I-695 Interchange. In general, I-95 and I-695 mainline widening would fill wetland systems that have hydrology linked to existing roadway drainage. Impacts would occur in the same wetland systems as in the General Purpose Lanes Alternate. Total wetland impacts for the Managed Lanes Alternate would be approximately 6.36 acres.

Assessment of Impacts to Wetland Functions: The majority of wetland impacts that would result from either of the Build Alternates would occur from the widening I-95 and I-695, and reconfiguration of the I-95/I-695 Interchange. In general, the widening of I-95 and I-695 would result in filling wetland systems (in whole or in part, depending on the system) that have hydrology linked to existing roadway drainage. The primary functions of these wetlands are in treating toxicants and sediments washed off the roadway and slowly infiltrating runoff into the water table. Wetlands in the vicinity of the I-95/I-695 Interchange and adjacent to Honeygo Run would be impacted by new, proposed roadway embankments. The wetland impacts at these locations mainly function in providing floodwater storage from Stemmers Run and Honeygo Run.

d. Endangered and Threatened Species

A letter requesting information on Federally-listed threatened or endangered species within or near the study area was sent to the US Fish and Wildlife Service (USFWS) on July 30, 2003 (***Appendix C***). A response was received on September 25, 2003 indicating that, "except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the study area" (***Appendix C***). Based on this finding, the Section 100 Project satisfies Section 7 of the Endangered Species Act.

In addition, letters requested information on State-listed threatened or endangered species were sent to the DNR on July 30, 2003 and again on February 20, 2004 for expanded areas (***Appendix C***). On January 6, 2004, MDNR responded by identifying the known presence and location of a Least Tern *(Sterna antillarum)* colony and the potential presence of four plant species of concern within the study area (***Appendix C***).

As stated above, none of the alternates would impact any Federally-listed threatened or endangered species, as no Federal species exist within the study area. The presence and potential impacts to State-threatened, endangered, or rare species within the study area

(as identified by MDNR) will be determined following field habitat surveys and species surveys, if required. These surveys will be performed during the breeding season for the Least Tern, and during the fruiting and flowering periods for the plant species (late spring and fall) (***Table III-10***). If suitable habitat(s) are identified within the study area, additional coordination with DNR would be undertaken to determine the need for a species survey(s). The Authority will continue to coordinate with DNR throughout the project planning process regarding the habitat presence and requirements of these species, and potential impacts to these species and their habitat.

e. Unique and Sensitive Areas

There are no unique and sensitive areas located within the study area. Therefore, no unique or sensitive areas would be impacted by any of the alternates considered.

F. Noise Impacts

1. Background and Noise Prediction Methodology

A detailed discussion of noise impacts and feasibility and reasonableness of noise control is presented in the *Section 100: I-95, I-895(N) Split to North of MD 43 Noise Technical Analysis Report* prepared for this project. Prediction modeling was conducted to assess projected 2025 design year noise levels and to assess noise abatement options, using FHWA Traffic Noise Model (TNM) Version 2.1. All impact analyses were performed in conformance with Title 23 of the Code of Federal Regulations, part 772 (23 CFR 772*) Procedures for Abatement of Highway Traffic Noise and Construction Noise* and the State Highway Administration (SHA) *Sound Barrier Policy (May 1998),* and procedures identified in FHWA document FHWA-PD-96-009, DOT-VNTSC-FHWA-98-1 *FHWA Traffic Noise User's Guide.* Each Noise Sensitive Area (NSA) was analyzed to determine potential impacts from each of the alternates.

2. Noise Abatement Criteria

Noise impacts were assessed based upon the following criteria:

- Projected 2025 design year noise levels that approach or exceed 67 decibels (dBA) for Activity Category B and 75 dBA for Activity Category C (approach is defined as 66 dBA and 74 dBA respectively), or
- Projected 2025 design year noise levels that exceed existing noise levels by more than 10 dBA (and exceed 57 dBA).

Several factors for evaluating and determining the feasibility and reasonableness of noise abatement are defined in the SHA *Sound Barrier Policy*. Details regarding these factors can be found in the *Section 100: I-95, I-895(N) Split to North of 43 Noise Quality Technical Report* prepared for this project.

Only those sound barriers determined to be feasible and reasonable would be approved for consideration. If any of the feasibility and reasonableness criteria cannot be satisfied, a sound barrier may be considered not feasible and/or reasonable.

3. Prediction Results

Table IV-13 presents predicted design year noise levels for each NSA, per alternate.

Table IV-13. Predicted Design Year Noise Levels

NSA	Receptor No.	Receptor Location	Adjusted Peak Hour Noise Level [1, 2, 3]	Design Year Noise Levels [1]		
				No-Build Alternate Noise Level [1, 3]	General Purpose Lanes Alternate Noise Level [1, 3]	Managed Lanes Alternate Noise Level [1, 3]
1	1-1	5701 Hamilton Avenue	64	69	72	72
2	2-1	5200 McCormick Avenue	63	66	68	68
3	3-1	5533 Lanham Way	61	63	65	66
	3-2	5306 Dew Garth	63	63	65	65
	3-3	5633 Daybreak Terrace	61	65	66	66
	3-4	5305 Zangs Lane	65	65	66	66
	3-5	519 Lanham Way	65	64	65	66
	3-6	5536 Lanham Way	59	55	63	57
	3-7	5626 Daybreak Terrace	58	60	63	61
	3-8	5703 Daybreak Terrace	58	63	65	65
4	4-1	5203 Horst Avenue	58	63	64	64
	4-2	8111 Callo Lane	61	61	62	64
	4-3	8120 Callo Court	53	54	55	56
5	5-1	1608 Weyburn Road	62	61	62	66
	5-2	7 Weyhill Court	61	62	62	73
	5-3	20 Weyfield Court	63	62	63	74
	5-4	9 Weyburn Court	55	59	59	67
	5-5	17 Weyfield Court	58	57	57	67
6	6-1	1701 Commons Court	61	61	61	73
	6-2	6201 Commons Road	61	62	62	75
	6-3	1828 William Court	58	63	64	71
	6-4	6205 Commons Road	54	56	56	62
	6-5	1821 William Road	59	64	64	69

Table IV-13. Predicted Design Year Noise Levels

NSA	Receptor No.	Receptor Location	Adjusted Peak Hour Noise Level [1, 2, 3]	Design Year Noise Levels [1]		
				No-Build Alternate Noise Level [1, 3]	General Purpose Lanes Alternate Noise Level [1, 3]	Managed Lanes Alternate Noise Level [1, 3]
7	7-1	5902 Kenwood Avenue	66	71	71	72
	7-2	8 Clayfield Court	67	72	74	78
	7-3	10 Chriswell Court	64	69	69	74
	7-4	22 Chriswell Court	62	64	64	67
	7-5	5903 Sandy Spring Road	66	65	67	69
	7-6	9025 Tarpleys Circle	58	57	58	59
	7-7	15 Chriswell Court	52	62	62	63
	7-8	5 Travis Court	54	63	62	64
8	8-1	7400 Meadow Branch Court	67	70	67	70
	8-2	11 Glendower Court	65	70	71	72
	8-3	7421 Kimbark Court	54	62	61	61
9	9-1	7501 Gilley Terrace	64	70	71	73
	9-2	7401 Gum Spring Road	66	70	66	71
	9-3	7403 Gum Spring Road	59	67	62	68
10	10-1	8601 Trumps Mill Road	65	69	65	70
	10-2	8600 Trumps Mill Road	68	69	67	72
11	11-1	7410 Rossville Boulevard	66	68	69	70
	11-2	4934 Babikow Road	73	76	78	79
12	12-1	Essex Community College	66	68	70	73
13	13-1	5116 King Avenue	61	65	66	65
	13-2	13-2 Nottingham Park	58	62	63	62
14	14-1	5010 Castlestone Drive	66	73	75	77
	14-2	5010 Bridgeford Circle	68	72	74	77
	14-3	5013 Bridgeford Circle	69	72	73	76
	14-4	5003 Bridgeford Circle	65	68	68	70
15	15-1	5035 Clifford Road	56	64	64	63
	15-2	5105 Clifford Road	59	65	64	64
	15-3	5129 Clifford Court	57	59	60	58
	15-4	8600 Lawrence Hill Road	53	52	53	52
	15-5	5130 Clifford Way	55	60	61	62

Table IV-13. Predicted Design Year Noise Levels

NSA	Receptor No.	Receptor Location	Adjusted Peak Hour Noise Level [1, 2, 3]	Design Year Noise Levels [1]		
				No-Build Alternate Noise Level [1, 3]	General Purpose Lanes Alternate Noise Level [1, 3]	Managed Lanes Alternate Noise Level [1, 3]
16	16-1	8615 Winding Way	66	69	70	73
	16-2	8650 Winding Way	64	69	71	76
	16-3	8610 Winding Way	59	64	64	65
17	17-1	5206 Silver Spring Road	67	69	71	77
18	18-1	8900 Cowenton Road	69	72	72	73
19	19-1	8836 Cowenton Avenue	67	70	70	70
	19-2	8939 Cowenton Avenue	67	70	70	72
20	20-1	5323 Joppa Road	63	69	69	70
21	21-1	5423 Joppa Road	61	62	62	63
	21-2	11229 Lilac Lane	62	63	65	65
22	22-1	5501 Kathryns Court	66	71	71	73
	22-2	5212 Cobbler Court	68	73	73	74
23	23-1	5502 Madge Court	66	71	72	74
	23-2	5512 Madge Court	65	71	71	73
	23-3	5501 Lloyd Avenue	64	63	72	73
	23-4	18 Sylvania Mobile Park	60	64	66	66
	23-5	5501 New Forde Road	59	61	68	68
	23-6	5507 Madge Court	58	64	62	63

Noise levels approach or exceed SHA impact criteria.

N/A = NSA not affected by the alternate.

1. All noise levels are Leq (dBA)
2. The peak hour adjustment factor was determined by the difference in noise levels between the peak hour and the actual measurement hour as identified by the 24-hour measurement.
3. Noise levels and adjustments were calculated to 0.1 decibel and then rounded to the nearest whole integer. Some minor differences in adjusted peak hour noise levels are due to rounding.

4. Impact Assessment/Abatement

As indicated in ***Table IV-13,*** 16 of the 23 identified NSAs would experience No-Build design year noise levels approaching or exceeding the impact criterion of 67 dBA for Category B sites. NSAs 4, 15, and 21 would experience design year Build and No-Build noise levels of less than 66 dBA, and would not be considered impacted. Since the No-Build Alternate would not involve additional highway improvements or increase existing capacity, noise abatement was not considered.

Feasibility and reasonableness of noise abatement was investigated for each impacted NSA for both Build Alternates. Build Alternate ROW constraints would preclude the construction of earth berms for noise abatement. Therefore, sound barriers were evaluated for each impacted area. Prior to determining insertion loss and cost determination for potential sound barriers, each NSA was screened for feasibility and reasonableness based on the SHA criteria.

A detailed discussion of sound barrier evaluations is presented in the *Section 100: I-95, I-895(N) Split to North of MD 43 Noise Technical Analysis Report*. Sound barriers were evaluated and found feasible and reasonable for the following NSAs:

General Purpose Lanes Alternate:	NSA 1, 3, 7, 11, 14, and 23
Managed Lanes Alternate:	NSA 1, 3, 5, 6, 7, 8, 9, 11, 14, 16, and 23

The length of each evaluated sound barrier was initially determined to ensure that the community was protected from "flanking noise" around the ends of the barrier. The barrier was then evaluated by investigation of different sound barrier profiles (location, length, and height) with the TNM Barrier Analysis module. During the analysis, the barrier was shortened incrementally to determine the length where "flanking noise" was no longer an issue. ***Table IV-14*** summarizes the barrier/cost analysis for NSAs where barriers were found to be feasible and reasonable, for each Build Alternate.

Table IV-14. Preliminary Barrier Cost Analysis Summary Table

NSA	Length (ft)	Height (ft)	Cost	Insertion Loss (first row residences)	Benefited Residences	Cost/Benefited Residence
General Purpose Lanes Alternate						
1	2,529	18	$752,934	9-13 (dBA)	35	$21,512
3	3,250	25	$1,343,875	3-12 (dBA)	30	$44,796
7	3,871	20	$1,280,527	8-15 (dBA)	35	$36,586
11	2,033	14	$470,761	7-12 (dBA)	14	$33,626
14	1,250	20	$413,500	7-9 (dBA)	36	$11,486
23	2,300	20	$760,840	6-8 (dBA)	28	$27,173
Total Cost = $5,022,437						
Managed Lanes Alternate						
1	2,529	18	$752,934	5-14 (dBA)	35	$21,512
3	3,250	25	$1,343,875	3-12 (dBA)	30	$44,796
5&6	2,258	20	$746,946	2-12 (dBA)	37	$20,188
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
23	2,300	20	$760,840	5-10 (dBA)	28	$27,173
Total Cost = $8,601,197						

5. Construction Noise

Land uses that are sensitive to vehicular noise would also be sensitive to construction noise. Although highway construction is a short-term phenomenon, it can cause substantial noise impacts. Additionally, it is possible 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 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 can 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. In addition, maintenance of construction equipment would be regular and thorough to minimize noise emissions due to inefficiently tuned engines, poorly lubricated moving parts, poor to ineffective muffling/exhaust systems, etc.

G. Air Quality Impacts

Carbon monoxide (CO) impacts are analyzed as the accepted indicator of vehicle-generated air pollution. The EPA's CAL3QHC dispersion model was used to predict CO concentrations for air quality-sensitive receptors for the project build year of 2010 and design year of 2025**.** The model predicted CO air quality impacts from vehicular emissions at each receptor location for these two study years for the No-Build Alternate, the General Purpose Lanes Alternate, and the Managed Lanes Alternate. Background CO concentrations were added to the modeled one-hour and eight-hour average CO concentrations for comparison to the State and National Ambient Air Quality Standards (S/NAAQS).

1. CO Microscale Analysis

The results of the predicted CO concentrations for the No-Build and the two Build Alternates are described below. For additional technical information regarding the CO microscale analysis, refer to the *Section 100: I-95, I-895(N) Split to North of MD 43 Air Quality Technical Report* prepared for this project. The technical report details the analysis input, including traffic data, vehicular emissions, CAL3QHC analysis, and background CO levels.

CO modeling of the Section 100 study area was conducted using the EPA's CAL3QHC model. Model runs were completed for AM peak hour, PM peak hour, and eight-hour average traffic volumes for both the build year (2010) and the design year (2025). CAL3QHC models did not predict any concentrations that would exceed the S/NAAQS of 35 parts per million (ppm) for the one-hour concentration or nine ppm for the eight-hour concentration. The S/NAAQS concentrations would not be exceeded for the No-Build Alternate or either of the two Build Alternates. Detailed results at each receptor location for each of the proposed alternates for the year 2010 are presented in ***Table IV-15***. Results for the year 2025 are presented in ***Table IV-16***. The values shown in these tables combine the background CO concentration with the maximum observed concentration at each receptor.

Table IV-15. 2010 CO Concentrations

Rec.	No-Build		General Purpose		Managed		Rec.	No-Build		General Purpose		Managed	
	1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr		1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr
D-1	N/A	N/A	9.8	5.1	N/A	N/A	E-1	N/A	N/A	10.4	5.0	N/A	N/A
D-2	N/A	N/A	10.0	5.0	N/A	N/A	E-2	N/A	N/A	10.4	5.1	N/A	N/A
D-3	N/A	N/A	9.8	5.2	N/A	N/A	E-3	N/A	N/A	10.8	5.2	N/A	N/A
D-4	N/A	N/A	9.9	5.3	N/A	N/A	E-4	N/A	N/A	10.4	5.1	N/A	N/A
D-5	N/A	N/A	10.1	5.5	N/A	N/A	E-5	N/A	N/A	10.5	5.4	N/A	N/A
D-6	N/A	N/A	10.2	5.1	N/A	N/A	E-6	N/A	N/A	10.9	5.1	N/A	N/A
D-7	N/A	N/A	10.3	5.4	N/A	N/A	E-7	N/A	N/A	10.4	5.1	N/A	N/A
D-8	N/A	N/A	10.4	5.2	N/A	N/A	E-8	N/A	N/A	10.3	5.1	N/A	N/A
D-9	N/A	N/A	10.5	5.0	N/A	N/A	E-9	N/A	N/A	10.5	4.9	N/A	N/A
SR1	8.9	4.5	9.4	4.8	9.1	4.4	SR19	9.9	4.7	9.9	4.6	9.2	4.3
SR2	10.5	5.0	11.3	5.5	10.9	5.0	SR20	8.6	4.6	8.6	4.7	9.1	4.6
SR3	11.5	5.3	12.6	5.8	12.4	5.5	SR21	8.6	4.8	9.0	4.8	8.5	4.5
SR4	13.1	6.0	14.2	6.2	13.5	6.0	SR22	9.9	4.8	9.2	5.0	8.8	4.5
SR5	7.8	4.1	8.2	4.2	7.7	4.0	SR23	9.5	4.9	9.9	5.0	9.1	4.6
SR6	16.5	6.3	18.1	6.8	16.9	6.5	SR24	12.0	5.6	11.9	5.9	11.8	5.7
SR7	9.2	4.6	9.5	4.8	9.2	4.6	SR25	13.3	6.0	13.9	6.3	13.5	6.2
SR8	12.9	5.8	12.8	6.1	13.9	6.0	SR26	12.2	5.5	12.9	5.8	14.4	6.2
SR9	13.8	5.8	12.7	5.5	12.3	5.5	SR27	11.3	5.9	11.4	6.1	13.2	6.4
SR10	11.5	5.1	10.6	4.8	10.1	4.6	SR28	20.6	7.1	21.2	7.6	21.0	7.8
SR11	9.9	4.9	9.4	4.8	10.9	5.1	SR29	8.7	4.4	9.1	4.4	7.9	4.2
SR12	12.2	5.2	12.1	5.5	12.3	5.4	SR30	8.0	4.5	8.3	4.4	8.1	4.2
SR13	13.9	6.2	13.7	6.4	20.2	8.2	SR31	10.0	5.2	10.2	4.9	10.0	4.8
SR14	7.8	4.1	8.0	4.0	7.7	3.9	SR32	12.9	6.0	13.2	6.1	13.8	6.4
SR15	12.9	5.6	13.4	5.6	14.4	6.0	SR33	11.7	5.2	12.0	5.4	12.3	5.4
SR16	9.9	4.8	10.0	4.5	9.6	4.5	SR34	12.9	5.9	12.3	5.9	12.4	5.8
SR17	11.3	4.7	10.4	4.8	9.7	4.5	SR35	16.7	6.7	15.8	6.6	17.0	6.5
SR18	11.2	5.4	12.2	5.3	11.6	5.2	SR36	9.6	4.9	9.7	5.0	9.6	4.8

1-hour and 8-hour average CO concentrations include a 4.8 ppm and 3.3 ppm background CO concentration, respectively.

The worst case (AM or PM peak hour) is shown for the 1-hour concentration.

S/NAAQS for 1-hour concentration = 35.0 ppm, for 8-hour concentration = 9.0 ppm.

Shaded cells represent the highest CO concentration for each scenario

N/A = No signal present, therefore no hot spot locations exist for this alternate.

D and E = Hot Spot Locations

SR = Sensitive Receptor Location

Table IV-16. 2025 CO Concentrations

Rec.	No-Build		General Purpose		Managed		Rec.	No-Build		General Purpose		Managed	
	1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr		1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr
D-1	N/A	N/A	9.4	4.9	N/A	N/A	E-1	N/A	N/A	9.8	5.0	N/A	N/A
D-2	N/A	N/A	9.5	5.0	N/A	N/A	E-2	N/A	N/A	10.1	4.9	N/A	N/A
D-3	N/A	N/A	9.2	5.1	N/A	N/A	E-3	N/A	N/A	10.4	5.1	N/A	N/A
D-4	N/A	N/A	9.7	5.1	N/A	N/A	E-4	N/A	N/A	10.3	4.9	N/A	N/A
D-5	N/A	N/A	9.7	5.3	N/A	N/A	E-5	N/A	N/A	10.1	5.1	N/A	N/A
D-6	N/A	N/A	9.7	5.1	N/A	N/A	E-6	N/A	N/A	10.3	4.8	N/A	N/A
D-7	N/A	N/A	9.8	5.0	N/A	N/A	E-7	N/A	N/A	10.2	5.0	N/A	N/A
D-8	N/A	N/A	10.0	4.8	N/A	N/A	E-8	N/A	N/A	9.9	5.1	N/A	N/A
D-9	N/A	N/A	9.9	5.0	N/A	N/A	E-9	N/A	N/A	10.1	4.8	N/A	N/A
SR1	8.4	4.3	9.0	4.6	8.7	4.4	SR19	9.0	4.5	9.4	4.4	9.0	4.2
SR2	9.6	4.8	10.8	5.3	10.3	4.9	SR20	7.9	4.5	8.2	4.5	8.8	4.4
SR3	10.4	5.2	12.0	5.6	11.7	5.1	SR21	8.1	4.5	8.5	4.7	8.3	4.4
SR4	11.9	5.7	13.2	5.9	12.4	5.8	SR22	9.1	4.6	8.5	4.8	8.3	4.3
SR5	7.4	4.1	7.8	4.1	7.5	4.0	SR23	8.6	4.7	9.1	4.8	8.6	4.4
SR6	14.8	6.0	16.9	6.6	15.9	6.4	SR24	11.0	5.3	11.6	5.6	11.2	5.5
SR7	8.6	4.5	9.0	4.7	8.8	4.6	SR25	12.0	5.8	13.0	6.0	12.8	5.9
SR8	11.9	5.5	12.0	5.8	12.6	5.8	SR26	11.0	5.3	12.0	5.5	13.2	5.9
SR9	12.2	5.6	11.8	5.5	11.4	5.3	SR27	10.5	5.6	10.8	5.9	12.2	6.2
SR10	10.5	4.9	10.0	4.7	9.4	4.5	SR28	17.9	6.6	19.7	7.0	18.9	7.4
SR11	9.1	4.8	8.7	4.7	10.1	5.0	SR29	8.2	4.3	8.9	4.4	7.8	4.2
SR12	11.1	5.1	11.7	5.3	11.4	5.2	SR30	7.8	4.4	8.0	4.3	7.9	4.1
SR13	12.1	5.9	12.8	6.2	18.2	7.8	SR31	9.4	5.0	9.7	4.7	9.5	4.6
SR14	7.4	4.0	7.8	4.0	7.4	3.9	SR32	11.8	5.7	12.4	5.9	12.8	6.1
SR15	11.6	5.3	12.7	5.4	12.8	5.8	SR33	10.4	5.0	11.7	5.1	11.5	5.3
SR16	9.3	4.5	9.5	4.5	9.2	4.3	SR34	11.5	5.6	11.7	5.7	11.6	5.6
SR17	10.4	4.5	9.8	4.6	8.9	4.3	SR35	15.2	6.4	14.7	6.3	15.4	6.2
SR18	10.1	5.2	11.6	5.1	10.8	5.1	SR36	8.9	4.8	9.3	4.8	9.2	4.6

1-hour and 8-hour average CO concentrations include a 4.8 ppm and 3.3 ppm background CO concentration, respectively.

The worst case (AM or PM peak hour) is shown for the 1-hour concentration.

S/NAAQS for 1-hour concentration = 35.0 ppm, for 8-hour concentration = 9.0 ppm.

Shaded cells represent the highest CO concentration for each scenario

N/A = No signal present, therefore no hot spot locations exist for this alternate.

D and E = Hot Spot Locations

SR = Sensitive Receptor Location

With the exception of the eight-hour CO concentration under the Managed Lanes Alternate, receptor SR-28 had the highest modeled CO concentration for both the one-hour and eight-hour time period, regardless of the alternate selected or the evaluation year. This receptor, located east of I-95 and south of the MD 43 Interchange, had the only one-hour concentration greater than 20 ppm.

In the 2010 build year, the CO concentration at receptor SR-13, located east of I-95 immediately north of the Kenwood Avenue overpass, had the only eight-hour CO concentration of approximately eight ppm, still less than the 9 ppm maximum concentration identified in the S/NAAQS.

2. Construction Impacts

The construction phase of the proposed project has the potential to impact the local ambient air quality by generating fugitive dust through activities such as demolition and materials handling. SHA has established *Specifications for Construction and Materials*, which describe procedures to be followed by contractors involved in site work. The Authority will adhere to these specifications to minimize construction-related impacts.

The Maryland Air and Radiation Management Administration (ARMA) was consulted, and determined that these specifications would satisfy the requirements of the *Regulations Governing the Control of Air Pollution in the State of Maryland*.

During the construction period, COMAR 26.11.06.03 requires that all appropriate measures be incorporated to minimize the impacts of construction on air quality. Specifically, applying water or appropriate liquids during demolition, land clearing, grading, and construction operations is recommended to minimize fugitive dust. Additionally, open-body trucks transporting materials should be covered at all times when in motion, and all excavated material should be removed promptly.

3. Conformity With Regional Air Quality Planning

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: 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).

The Authority is currently coordinating with the Baltimore Metropolitan Council (BMC) regarding inclusion of the Section 100 project into the new cycle for the Baltimore Region Transportation Improvement Program (TIP) 2005-2009. Conformity determination for the 2005-2009 TIP is scheduled for July 2004.

Section 100 is currently included in the 2001 Baltimore Regional Transportation Plan for illustrative purposes. It is anticipated that the Section 100 project will be included in the new long-range plan, Transportation 2030, which is scheduled for federal approvals in February 2005. The conformity status of the long-range plan will be determined concurrently with the conformity for the TIP in July 2004. Upon inclusion in the regional TIP, the project will also be incorporated into the State Implementation Plan (SIP).

H. Hazardous Materials Impacts

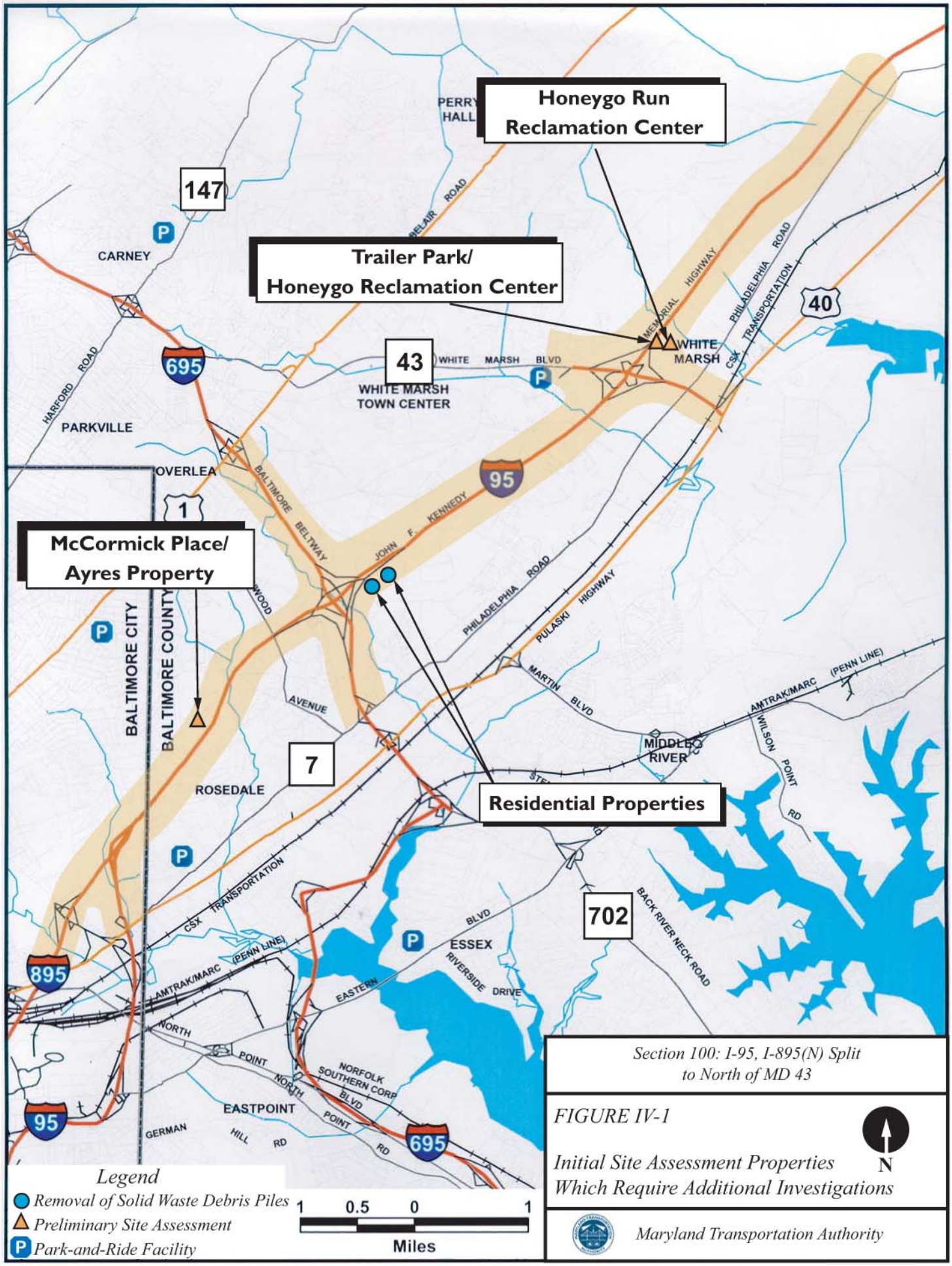
A total of 72 potentially hazardous sites were identified during the Initial Site Assessment (ISA), including five sites with a high potential contaminant value, 35 sites with a medium potential contaminant value, and 32 sites with a low potential contaminant value. The results of this analysis recommended further studies at five sites. ***Figure IV-1*** illustrates the general location of the five sites recommended for further analysis.

1. No-Build Alternate

The No-Build Alternate would not affect any potentially hazardous sites within the study area.

2. General Purpose Lanes Alternate

The General Purpose Lanes Alternate would impact three sites with a high potential contaminate value, 12 sites with a medium value, and seven sites with a low value. A Preliminary Site Assessment (PSA) is recommended for the three high potential contaminate value sites impacted - McCormick Place/Ayres Property (ADM ID No.3), Honeygo Run Reclamation Center (ADM ID No. 38), and Trailer Park/Honeygo Run Reclamation Center (ADM ID No. 38B). In addition, removal of solid waste debris piles would be necessary prior to construction activities for two sites having a medium-contaminant value (ADM ID No. 17 and 18, both of which are private residences along Trumps Mill Road). Although the Exxon Station located at 1771 Chesaco Avenue has a high potential contaminate value due to a groundwater contamination plume that extends from the property, it is not anticipated to present a concern, as the contaminated area would not be disturbed by the General Purpose Lanes Alternate.



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

FIGURE IV-1

Initial Site Assessment Properties Which Require Additional Investigations

Maryland Transportation Authority

Additional studies are not recommended at the remaining sites impacted by this alternate. It should be noted, however, that should Underground Storage Tanks (USTs) or other soil and/or groundwater contamination be encountered, remediation would be required in accordance with all applicable local and State regulations.

3. Managed Lanes Alternate

The Managed Lanes Alternate would impact the same sites as described under the General Purpose Lane Alternate, plus one additional site of medium contaminate value and two additional sites of low potential contaminate value. Therefore, total impacts for this alternate would include three high potential contaminate sites, 13 medium contaminant sites, and nine low contaminant sites. Similar to the General Purpose Lanes Alternate, the Exxon Station located at 1771 Chesaco Avenue would not be impacted, as the contaminated area would not be disturbed by the proposed alternate. As with the General Purpose Lanes Alternate, a Preliminary Site Assessment (PSA) is recommended for the three high potential contaminate value sites impacted - McCormick Place/Ayres Property (ADM ID No.3), Honeygo Run Reclamation Center (ADM ID No. 38), and Trailer Park/Honeygo Run Reclamation Center (ADM ID No. 38B) along with removal of the solid waste debris piles at ADM ID No. 17 and 18.

Additional studies are not recommended at the remaining sites impacted by the Managed Lanes Alternate. It should be noted, however, that should USTs or other soil and/or groundwater contamination be encountered, remediation would be required in accordance with all applicable local and State regulations.

I. Secondary and Cumulative Effects Analysis (SCEA)

A Secondary and Cumulative Effects Analysis (SCEA) was performed in compliance with the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) regulations that require the secondary and cumulative effects of a project to be examined along with direct impacts (CFR 1508.25 (c)).

Secondary (indirect) effects are defined as, “Effects which are “caused” by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 CRF 1508.8(b)). Cumulative effects are defined as, “Impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7).

The SCEA was divided into two sections - scoping and analysis/conclusions. The scoping section identifies the resources, SCEA geographical boundary, and time frame for the analysis. The analysis/conclusions section describes the past, present, and anticipated future impacts to resources within the SCEA geographical boundary and throughout the SCEA time frame.

1. Scoping

The SCEA scoping section was developed following the *Maryland State Highway Administration's June 2000 SCEA Guidelines for Environmental Impact Statements and Environmental Assessments*. Scoping involves identifying environmental resources in the study area, and consideration of the following scoping elements that form the basis for conducting the resource analysis:

- Defining resources to be analyzed,
- Establishing a SCEA geographical boundary, and
- Establishing a SCEA time frame.

a. Resources To Be Analyzed

In order to determine which environmental resources should be considered in the SCEA, those resources that would be directly impacted by the proposed alternates were first identified. In addition to directly impacted resources, any resources that would experience secondary effects would also be considered in the SCEA. The following resources were considered for the secondary and cumulative effects analysis:

- Communities/Businesses
- Floodplains
- Wetlands
- Surface Water/Aquatic Habitat
- Forests/Terrestrial Habitat
- Rare, Threatened, and Endangered Species

b. SCEA Geographical Boundary

Secondary and cumulative effects are farther removed from the project alternates than direct impacts. Therefore, the geographic limits for the analysis of secondary and cumulative effects reach beyond the Section 100 study area. The establishment of the SCEA boundary was a synthesis of all sub-boundaries into one overall SCEA boundary. ***Figure IV-2*** identifies the SCEA boundary in relation to all of the sub-boundaries. The sub-boundaries considered in establishing the SCEA boundary are described below.

Census Tracts: Census tract boundaries were identified from the United States Census Bureau 2000. The Census Tract sub-boundary was established by identifying all Census Tracts partially within the Section 100 study area boundary ***(Figure IV-2)***.

Sub-watersheds: This natural environmental sub-boundary was established by identifying all sub-watersheds within, or partially within, the Section 100 study area. Although impacts to natural resources were based upon information available at the sub-watershed level, the outer perimeter of these sub-watersheds was not shown as part of the overall SCEA geographical boundary because this would result in an extremely large SCEA boundary, and would overextend the area that is considered prudent for assessing all secondary and cumulative impacts. Natural resources were, however, assessed at the sub-watershed level even though the overall boundary does not show that extent of coverage.

Area of Traffic Influence: The area of traffic influence for Section 100 was based upon a comparison of traffic volumes from model runs between the No-Build and the General Purpose Lanes Alternate. This Build Alternate was chosen to identify the greatest difference in traffic volumes from the No-Build Alternate. The Baltimore Metropolitan Council's regional model for 2025 was used for the analysis. The comparison examined the differences in volumes to define an outer boundary where a meaningful change occurred in traffic volumes between the alternates.

Summary: The outermost extent of the overlaid sub-boundaries depicted on ***Figure IV-2*** comprises the overall SCEA boundary. The SCEA boundary established for this project consists of a combination of the Census Tract sub-boundary and the Area of Traffic Influence sub-boundary.

Although Section 100 is a section of a much larger major transportation facility that accommodates both local and regional traffic, the SCEA geographical boundary was established based on the likely extent of impacts within sub-boundaries that would likely experience directs affects from the Section 100 proposed alternates. This rationale for establishment of the SCEA boundary allows for assessment of secondary and cumulative effects in accordance with 40 CFR 1508.7 and 1508.8(b). For example, the extent of the sub-watershed sub-boundary included all sub-watersheds that would likely experience not only direct project impacts, but also other potential secondary and cumulative effects. Similarly, the Area of Traffic Influence sub-boundary includes the geographic extent to which the Section 100 project would affect traffic levels on nearby roadways, and the census tracts selected for consideration in the SCEA include all tracts that would be affected by the proposed Build Alternates.

Jones Falls Sub–Watershed

Lower Gunpowder Falls Sub–Watershed

Little Gunpowder Falls Sub–Watershed

Back River Sub–Watershed

Patapsco Back River Tributary Basin

Study Area

Upper Western Shore Tributary Basin

Bird River Sub–Watershed

Baltimore Harbor Sub–Watershed

Back River Sub–Watershed

Middle River – Browns Sub–Watershed

Gunpowder River Sub–Watershed

YORK ROAD

RAVEN BLVD

LOCH RAVEN

HARFORD ROAD

BELAIR ROAD

BALTIMORE BELTWAY

WHITE MARSH BLVD

JOHN F. KENNEDY MEMORIAL HIGHWAY

PHILADELPHIA ROAD

PULASKI HWY

NORTH POINT BLVD

Baltimore City

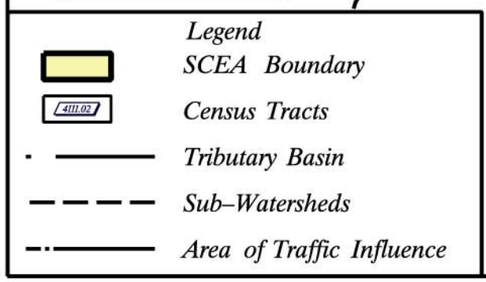
Baltimore County

45 542 147 695 1 7 43 95 40 895

4401 4402 4403 4404 4405 4406 4407.01 4407.02 4408 4409 4410 4411.01 4411.02 4501 4512 4513 4514 4517.01 4517.02

2601.01 2601.02 2602.01 2602.02 2602.03 2603.01 2603.02 2603.03 2604.01 2604.02 2604.03 2604.04

4111.02 4113.02 4113.03 4113.04 4113.06 4113.07 4114.06 4114.07 4114.08 4114.10



1 Mile 0.5 Mile 0 1 Mile

N

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

FIGURE IV–2
SCEA Boundary

Maryland Transportation Authority

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Because Section 100 is a piece of much larger transportation facility, I-95, consideration must be given to the affects of development patterns in areas extending beyond the SCEA geographical boundary. As previously stated, the purpose of Section 100 is to address capacity and safety needs on Section 100 and thereby improve access, mobility and safety for local, regional and inter-regional traffic, including passenger, freight and transit vehicles. Although capacity and safety are identified as the project needs, the extent, pace and location of development growth along I-95 will be influenced and controlled by State and County land development policies and plans. Section 100 will accommodate future planned growth in areas that may extend outside the SCEA boundary; however, future growth is not dependent on proposed improvements to Section 100.

Harford County, located north of the Section 100 study area, has experienced substantial growth in recent decades. Harford County supports growth in a designated "Development Envelope," which represents "the land area within Harford County that is designated to accept development levels requiring public water and sewer service" (Harford County Master Plan, 1996). Based on future planned growth within the Development Envelope, Harford County will continue to experience growth in the future. According to the Harford County Transportation Plan (Harford County, 2000), Harford County recognizes that transportation facilities have continually been challenged to keep pace with the County's increasing population and development. Harford County, therefore, encourages County residents to carpool, vanpool or utilize public transportation as opposed to commuting alone in an effort to reduce congestion.

Harford County's Transportation Plan identifies improvements to the proposed highway network in the County. This Plan calls for I-95 improvements at the MD 24, MD 543, and MD 22 Interchanges, as well as High Occupancy Vehicle (HOV) lanes from the Baltimore/Harford County line to MD 24. The Plan suggests that planned future development patterns in the Development Envelope will be accommodated by the proposed highway network identified in the Transportation Plan. The Plan does not specifically address any I-95 capacity improvements within Baltimore County.

Based on this assessment, it can be concluded that each individual County will be responsible for monitoring and applying growth management techniques so that development activities grow at a consistent pace with roadways and other necessary infrastructure to accommodate the growth.

c. SCEA Time Frame

The SCEA must consider past, present, and future actions. It was therefore necessary to determine the appropriate time frame within which to conduct the analysis.

The past time frame for the SCEA was determined based on data that included events in the historic context of the area that may have influenced population and land use. ***Figure IV-3*** shows a timeline of those events. A variety of events were considered in establishing the past time frame including:

- Transportation developments including the opening and expansions of I-95, I-695, I-895, the Harbor Tunnel, the Fort McHenry Tunnel, and MD 43 from the 1950s to the present time,
- Land use trends beginning with the establishment of the Baltimore County Urban Rural Demarcation Line (URDL) in 1967 and subsequent planning milestones in Baltimore County, Baltimore City, and the State of Maryland, and
- Proposed Growth districts including the inception of the Perry Hall – White Marsh Growth Area in 1979 and the Middle River Employment Center Plan in 1997.

Population growth from the 1950s to the present was also considered when establishing the SCEA time frame. ***Figure IV-4*** shows the change in population within the SCEA boundary, Baltimore County, and Baltimore City from 1950 to 2000.

Population growth was dramatic in the study area between 1950 and 1970, when most of the major road network was built. The Baltimore Beltway between US Route 1 (Belair Road) and I-95 was constructed in 1960 (south of I-695), and I-95 (JFK) opened to traffic in 1963. MD 43 (White Marsh Boulevard) also began construction in that year between US 40 and I-95. Population within the SCEA study area grew 26 percent between 1960 and 1970, higher than any other decade. It is apparent that the opening of these roads resulted in substantial change in population and land use.

1963 has been selected as the past time limit because this date marks the opening of I-95 in the study area as well as several other major roadways affecting land use. Soon after the population increase of the 1950s and 1960s, Baltimore County established its URDL to control development by focusing it within an urban boundary. The study area for Section 100 is located completely within the URDL, where development is concentrated. In 1979, Baltimore County designated the Perry Hall - White Marsh Growth Area in response to the burgeoning population and additional growth opportunities in this area. The Perry Hall - White Marsh Growth Area continues to be a designated growth area and continues to be the fastest growing portion of Baltimore County. In the 1990s, the Perry Hall - White Marsh Growth Area accounted for 18 percent of the total population growth in Baltimore County.

The time limit for reasonably foreseeable future actions was determined to be 2025 because this is the design year of the project and also the year for which the Baltimore Metropolitan Council has conducted travel forecasting used for this project. The travel forecasting model includes population growth projections and land use assumptions for 2025.

Figure IV-3:
SCEA Timeline

Land Use Events | *Population* | *Transportation Improvements* | *Other*

1951 - Construction of I-695 begins, first area to be built is between MD 648 and Nursery Road, south of Baltimore.

1955 - The Baltimore Harbor Tunnel Opens

1955 - Construction begins on I-695 in the Towson area

1956 - I-895 Mainline opens

1957 - I-695 from MD 146 to Cromwell Bridge Road / Loch Raven Boulevard is built as 4 lane road

1960 - I-695 from US 1 to I-95 is built as 4-lane road

1963 - I-95 Opens with 6 lanes from I-895 to MD 43 and 4 lanes from MD 43 north (I-95 Section 100 Purpose and Need)

1963 - MD 43 was constructed between I-95 and US 40 (White Marsh - Perry Hall Plan)

1963 - Interchange at I-695 Opened (I-95 Section 100 Purpose and Need)

1963 - Partial interchange at MD 43 Opened (I-95 Section 100 Purpose and Need)

1967 - Third lanes added to each direction on I-695 from Cromwell Bridge Road to I-95

1967 - Baltimore County established the Urban Rural Demarcation Line (URDL) to manage growth in a manner that preserves important natural and agricultural areas and maximizes the efficiency of county revenues spent on transportation, utilities and other capital projects. (Baltimore County Master Plan 2010)

1972 - The 1980 Guideplan for Baltimore County is adopted as the first formal Master Plan for Baltimore County. It projected the County population in 1980 to be 740,000. Its philosophy was to accommodate growth and development in an orderly, environmentally sensitive manner with adequate open space. (Baltimore County Master Plan 2010)

1972 - 2 lanes added (one in each direction) to I-95 north of MD 43 (I-95 Section 100 Purpose and Need)

1972 - Interchange with I-895 Constructed (I-95 Section 100 Purpose and Need)

Mid 1970's - Remaining ramps of MD 43 Interchange opened (I-95 Section 100 Purpose and Need)

1975 - The Baltimore County Comprehensive Plan, 1975 is adopted and reorganized land use and development planning into comprehensive growth management program to reduce inefficient land use development. Urban and rural zoning is established. (Baltimore County Master Plan 2010)

1977 - The Francis Scott Key Bridge opens

1979 - The Baltimore County Master Plan, 1979-1990 is adopted. It reinforces the philosophies of the Baltimore County Comprehensive Plan, 1975 and designated two growth areas of Perry Hall -White Marsh and Owings Mills. Future development was to be directed to these areas and therefore protecting agricultural and sensitive watershed land in other areas of the county. (Baltimore County Master Plan 2010)

1981 - The White Marsh Mall opens with over 1 million square feet of commercial space (Baltimore County Master Plan 2010)

1984 - Baltimore City transfers ownership of 130 acres to Johns Hopkins Hospital for development of the Bayview Medical Campus near I-95 and I-895.

1985 - The Fort McHenry Tunnel opens

1985 - 2 Lanes added to MD 7 from Campbell Boulevard to MD 43

1985 - The Perry Hall - White Marsh Plan is adopted. (Baltimore County Master Plan 2010)

- Introduces proposals to build White Marsh Boulevard (MD 43) and Perry Hall and Honeygo Boulevards to radiate from the south to the north
- Established the White Marsh Mall as the Town Center
- The Philadelphia Road Corridor is identified as an industrial and mixed-use development corridor

1989 - The Baltimore County Master Plan 1989-2000 is adopted, and creates specific land use management policies including growth areas, urban centers, community conservation areas, employment areas and rural management areas. Economic growth is encouraged for the Perry Hall - White Marsh and Owings Mills areas. (Baltimore County Master Plan

1991 - Jan 30, Ownership of the JFK transfers from the Maryland State Highway Administration to the Maryland Transportation Authority (I-95 Section 100 Purpose and Need)

1991 - ISTEA (Intermodal Surface Transportation Efficiency Act) federal legislation is passed

1991 - Maryland Forest Conservation Act is passed

1992 - Baltimore County Forest Conservation Act is passed

1992 - The Maryland Economic Growth, Resource Protection and Planning Act is passed

1992 - The Philadelphia Road Corridor Study is adopted by the Baltimore County Council. It refined land use goals based on the Perry Hall - White Marsh Plan to promote commercial and industrial development. (Baltimore County Master Plan 2010)

1993 - I-95 from I-695 to MD 43 extended from I-95 to I-695 and widened to 8 lanes, 4 in each direction (I-95 Section 100 Purpose and Need)

1994 - Baltimore County population surpasses Baltimore City (Baltimore County Master Plan 2010)

1994 - A fourth lane is added to I-95 northbound from MD 43 (I-95 Section 100 Purpose and Need)

1994 - The Honeygo Plan is adopted and the Honeygo Overlay Districts are developed to promote residential development and traditional neighborhood design standards for new communities. (Baltimore County Master Plan 2010)

1995 - MD 43 extended from Honeygo Boulevard to I-695

1995 - Fifth lane added to US 1 between Rossville Boulevard and MD 43

1996 - Fifth lane added to US 1 between Joppa Road and Forge Road

1996 - 2 lanes added to I-695 between I-95 and MD 702

1996 - Baltimore County Office of Community Conservation is created and adopts the Consolidated Plan 1996, Baltimore County, Maryland to enforce programs of community revitalization and stabilization (Baltimore County Master Plan 2010)

1996 - The Eastern Baltimore County Revitalization Strategy is adopted and designates the White Marsh Business Community and Town Center as an anchor for economic development in eastern Baltimore County (Baltimore County Master Plan 2010)

1997 - Maryland Smart Growth Legislation (Smart Growth Act) is enacted directing state funded infrastructure funds to areas within or connecting county-designated and state-certified priority funding areas.

1997 - The Middle River Employment Center Purpose and Need is published focusing on development of the 1000 acre A.V. Williams property in the Middle River area and Martins State Airport area as a target for major commercial and industrial development

1997 - The Perry Hall - White Marsh planning area has a population of 52,618 and is estimated to grow to 64,201 by 2010. (Baltimore County Master Plan 2010)

1998 - 2 Lanes added to I-695 from I-83 to MD 140

1998 - 2.9 Million SF of non-residential development is built in the Perry Hall - White Marsh area since 1990 (Baltimore County Master Plan 2010)

1998 - TEA-21 (Transportation Equity Act for the 21st Century) is passed

1999 - February, Baltimore Regional Transportation Board adopts the Maryland Congestion Management Study

1999 - The Avenue at White Marsh opens as a major commercial and entertainment center within the White Marsh Town Center area

2002 - Fall, Maryland Transit Administration adopts the Baltimore Regional Rail System Plan (I-95 Section 100 Purpose and Need)

2003 - Public Scoping for the Green Line Corridor Transit Study is initiated for a portion of the Green Line from the Baltimore Regional Rail System Plan from Johns Hopkins Hospital to Morgan State University. Future links to the White Marsh area is planned.

2003 - Public Scoping for the Red Line Corridor Transit Study is initiated for a portion of the Red Line from the Baltimore Regional Rail System Plan from Social Security/Woodlawn area to Patterson park

2003 - Construction begins for the MD 43 extended project from the terminus of existing MD 43 at US 40 to MD 150 near Martins State Airport.

2003 - Construction Begins to add lane to outer loop of I-695 between MD 144 and I-95

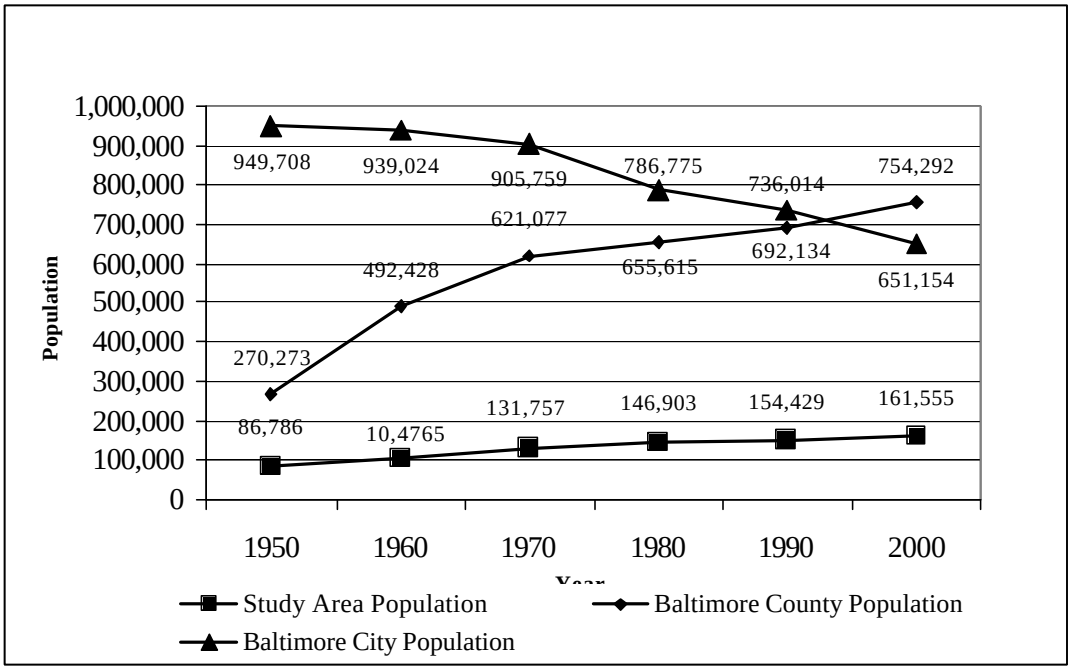
2003 - Construction completed for MD 7 widening from MD 43 to Campbell Boulevard

2003 - Design studies for Campbell Boulevard extension are initiated

2003 - The Baltimore Metropolitan Council and Baltimore Regional Transportation Board releases the Vision 2030 Report, which emphasizes a comprehensive transit program; developing a transportation system that connects multiple modes with key employment centers and communities; and redevelopment with new urbanism principles

2025 - I-95 Section 100 improvements design year

Figure IV-4. Population Growth 1950 to 2000.



2. Analysis Methodology

A combination of analysis methodologies were employed to fully assess secondary and cumulative effects. Analysis of past effects included research and review of published literature, census information at the Census Tract level, and historic aerial photography. Geographic Information System (GIS) mapping was obtained and/or created for the SCEA boundary area, and was used to assess trends from the past to the present time frame. Potential changes in land use were studied with the aid of regional plans, specifically the *Master Plan 2010.*

The SCEA was based on readily available data and not necessarily based on a comprehensive data set. Therefore, many conclusions drawn for this analysis are qualitative. The following methods were used for this SCEA analysis:

Trend Analysis: Trend analysis was used to identify effects over time and to project future cumulative effects. Past data was collected and compiled to identify past effects or trends, and this information was then used to project future effects.

Interviews: Information from County planners regarding proposed future development within the SCEA boundary was used to project future trends and identify trends.

Overlays: Overlays of land use maps and aerial photography were used to identify past trends and to identify resources potentially at risk in the future.

3. Land Use Scenarios

Three land use scenarios (past, existing, and future) and corresponding maps were prepared for use in overlay analysis and in identifying trends in land use from the past to present time frame. In addition, land use potentially at risk in the future was identified by overlaying existing land use mapping with future land use mapping. ***Figures IV-5, IV-6, and IV-7*** show past, existing (present), and future land use within the SCEA boundary, respectively.

a. Past Land Use

The past land use map was based on 1960 historic aerial photography obtained from the Baltimore County Office of Planning ***(Figure IV-5)***. As evident in the land use maps, there has been a substantial decrease in forested and agricultural land since 1960 due to increased development and transportation demands. However, it is anticipated that this trend will not continue at the same rate due to local, State, and Federal regulatory requirements and Maryland's Smart Growth legislation that are now being implemented.

b. Existing Land Use

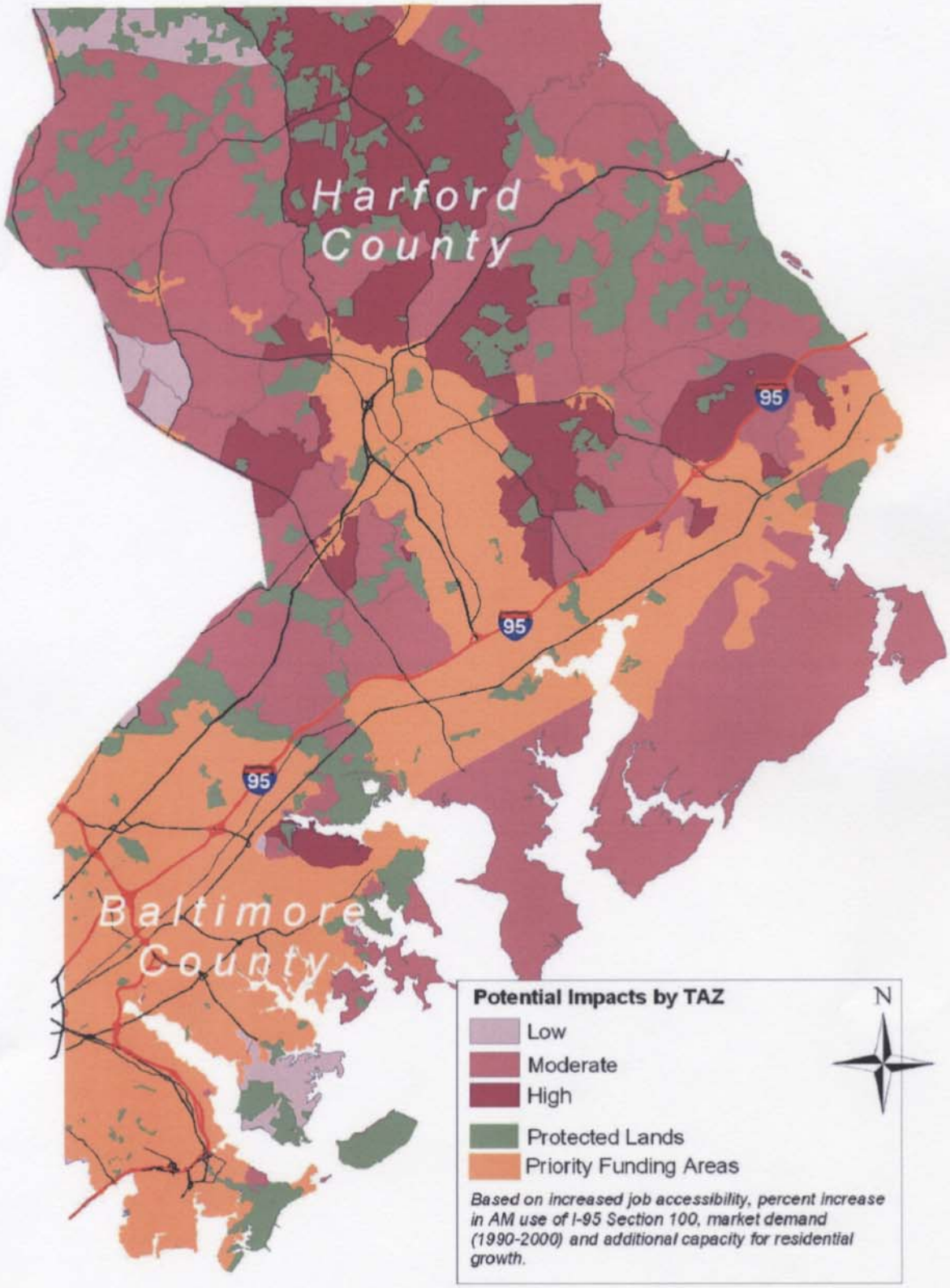
Existing land use within the SCEA boundary is comprised of open space, residential, commercial, industrial, transportation, and parkland/recreation. Baltimore City land use consists primarily of mixed residential areas as well as industrial areas near the I-95/I-895 split. Land use within the SCEA boundary also includes mining operations in Baltimore County that have been active since before the SCEA past time frame. Please refer to ***Figure IV-6*** for existing land use within the SCEA boundary.

The Baltimore County Office of Planning provided data on proposed developments in the SCEA boundary. All Baltimore County residential, commercial, and institutional development proposals (with submitted concept plans) were identified as near future development. Near future development was defined as development that will occur within five years from present time. A summary of the proposed development is provided in ***Table IV-17.*** The approximate locations of these proposed developments are depicted on ***Figure IV-8***.

c. Future Land Use

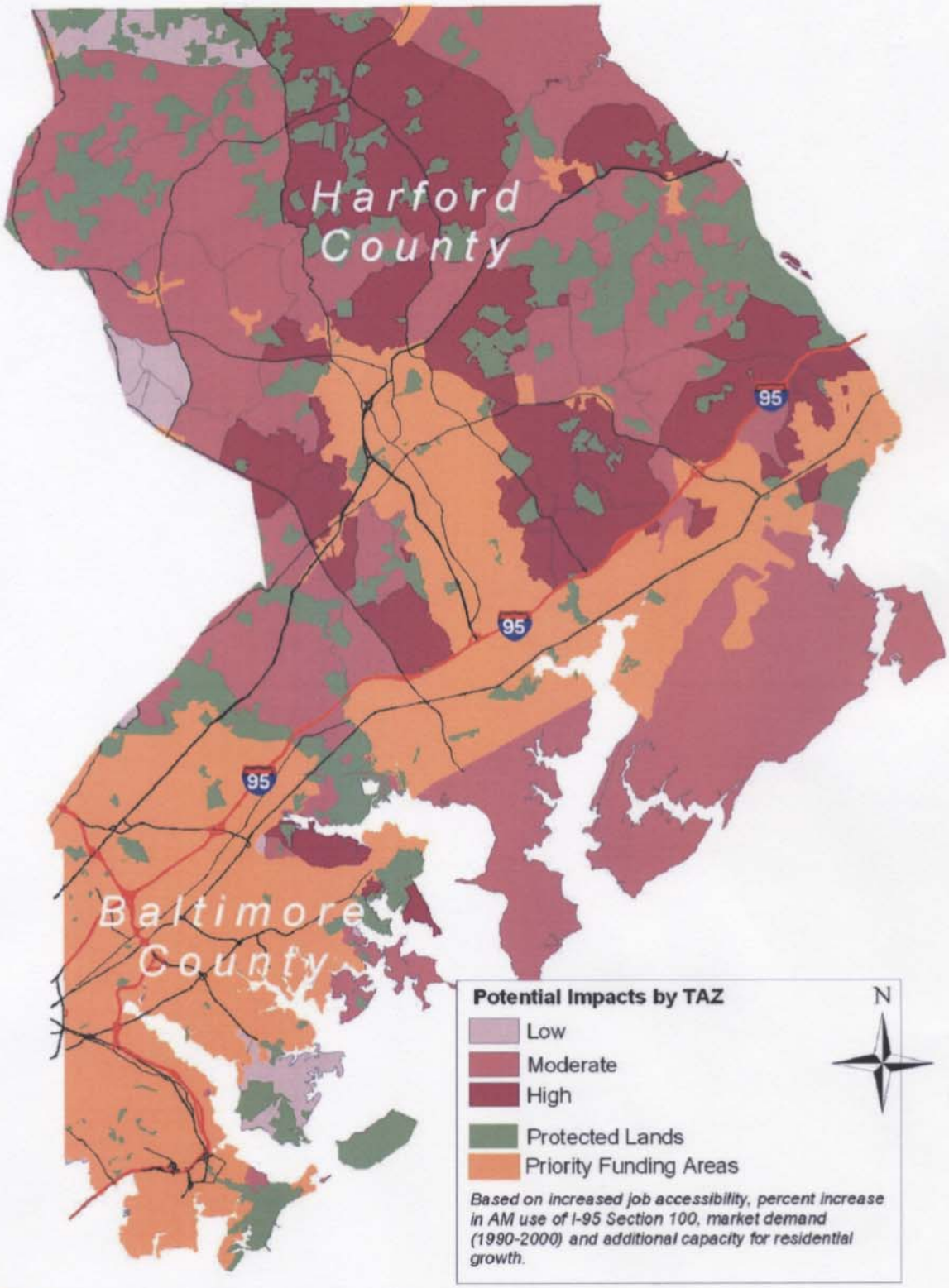
In general, future land use is expected to be similar to existing land use in the SCEA boundary. The assessment of future land use was based on Baltimore County's planned development areas as identified in the *Master Plan 2010* (Baltimore County Council, 2000). In addition, other undeveloped areas not currently planned for future development, but that may experience secondary development were also identified.

Figure IV-5a. Potential Impacts of Alternate 2 on Residential Development



MDP Maryland Department of Planning
April 2004

Figure IV-5b. Potential Impacts of Alternate 3 on Residential Development



MDP Maryland Department of Planning
April 2004

Legend

- Residential
- Scattered Residential/ Commercial
- Commercial
- Industrial
- Open Space
- Mining
- Forested
- Institutional
- Agricultural
- Water

695 BALTIMORE BELTWAY

HARFORD ROAD

BELAIR ROAD

1

95

7 PHILADELPHIA ROAD

PULASKI HIGHWAY

40

Future Location of I–95

Study Area

YORK ROAD

45

LOCH RAVEN BLVD

542

HARFORD ROAD

147

BELAIR ROAD

Baltimore City

Baltimore County

PHILADELPHIA ROAD

PULASKI HWY

NORTH POINT BLVD

895

95

695

1 Mile 0.5 Mile 0 1 Mile

N

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

FIGURE IV–6
SCEA – Past Land Use

Maryland Transportation Authority

Source: 1959 Regional Land Use Plan, Baltimore Regional Planning Council/Past Land Use

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Legend

- Residential
- Commercial
- Industrial
- Open Space
- Mining
- Forested
- Institutional
- Agricultural
- Wetlands
- Water

Study Area

695 BALTIMORE BELTWAY
HARFORD ROAD
BELAIR ROAD
BRADSHAW ROAD
1 FORGE ROAD
PUTTY HILL AVE
YORK ROAD
45
LOCH RAVEN BLVD
542
147
HARFORD ROAD
WHITE MARSH BLVD
43
SILVER SPRING ROAD
JOPPA RD
JOHN F. KENNEDY MEMORIAL HIGHWAY
95
7 PHILADELPHIA ROAD
PULASKI HIGHWAY
KENWOOD AVE
Baltimore City
Baltimore County
PERRY HALL BLVD.
40
JOPPA FARM ROAD
ROSSVILLE BLVD
PHILADELPHIA ROAD
PULASKI HWY
MARTIN BLVD
MIDDLE RIVER ROAD
BIRD RIVER ROAD
EBENEZER ROAD
NORTH POINT BLVD
895
95
695

1 Mile 0.5 Mile 0 1 Mile

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

FIGURE IV–7
SCEA – Existing Land Use

N

Maryland Transportation Authority

Source: DNR Technology Toolbox(2001)

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Table IV-17. Near Future Residential Development

Name of Proposed Development	Classification	Location	Type of Development	Date of Concept Plan Submittal
Baltimore County				
Bley Property	Residential	Winding Way Perry Hall, MD	Single Family (4 Detached)	08/05/02
Glenside Overlook	Residential	New Gerst Lane Perry Hall, MD	Single Family (13 Detached)	02/11/03
Honeybrook Farm	Residential	Cowenton Avenue Perry Hall, MD	Single Family (29 Detached)	11/20/02
John Kraft Property	Residential	New Forge Road Perry Hall, MD	Single Family (6 Detached)	Unknown
Lince Property	Residential	Joppa Road Perry Hall, MD	Single Family (3 Detached)	10/22/02
Misty Meadows	Residential	Cowenton Avenue Perry Hall, MD	Single Family (15 Detached)	09/09/03
Frederick Myers Property	Residential	Joppa Road Perry Hall, MD	Single Family (46 Detached)	11/05/03
Parkside Pud	Residential	Rexis Avenue Perry Hall, MD	Single Family (1 Detached) Multi-Family (96 Units) Singe Family (44 Attached)	07/17/01
Perry Hall Meadows	Residential	Joppa Road Perry Hall, MD	Single Family (41 Detached)	11/20/02
Reynolds/Spiers Property	Residential	Rexis Avenue Perry Hall, MD	Single Family (15 Detached)	02/04/03
Carrington Ridge	Residential	Carrington Drive White Marsh, MD	Single Family (18 Detached)	10/26/99
Gambrill Property	Residential	Vincent Farm Lane White Marsh, MD	Single Family (15 Detached)	08/23/02
Cross Road Properties	Residential	Cross Road Perry Hall, MD	Single Family (51 Detached)	07/22/03
St. Michael's Evangelical Lutheran Church	Institutional	Belair Road Perry Hall, MD	Access Road for Church	Unknown
Hagan-Hall Property	Residential	Philadelphia Road Perry Hall, MD	Single Family (17 Detached)	05/28/202
Oelke Property	Residential	Hamilton Place White Marsh, MD	Single Family (29 Detached)	09/20/2002
Ramsey Boys LLC Property	Commercial	Pulaski Highway White Marsh, MD	Mobile Home Sales and Service	02/04/2003
McDonald's Restaurant	Commercial	Belair Road Nottingham, MD	McDonald's Restaurant	Unknown
Perry Ridge Two	Residential	Perry Hall Boulevard	Single Family	07/15/2003

Table IV-17. Near Future Residential Development

Name of Proposed Development	Classification	Location	Type of Development	Date of Concept Plan Submittal
		Nottingham, MD	(7 Detached)	
Putty Hill Woods	Commercial	Putty Hill Road Nottingham, MD	Single Family (17 Detached)	Unknown
Goddard Property	Residential	Bucks School House Road Rosedale, MD	Single Family (43 Detached)	01/22/2003
Ridge Meadows	Residential	Ridge Road Rosedale, MD	Single Family (17 Detached)	10/21/2003
Open Bible II	Institutional	Belair Road Nottingham, MD	Proposed Church	Unknown
Sheldon Property	Commercial	Pulaski Highway Rosedale, MD	Proposed Service Garage	Unknown
Helen Baker Property	Residential	Maple Avenue Rosedale, MD	Single Family (43 Detached)	10/07/2003
King Crest Estates	Residential	King Avenue Rosedale, MD	Single Family (10 Detached)	08/05/03
Baltimore City				
Industrial		Holander Ridge Baltimore City, MD	Industrial Park Expansion	Continuous Program
Commercial		Pulaski Highway Corridor Baltimore City, MD	Commercial Development	Continuous Program
Source: Baltimore County Office of Planning/Baltimore City CIP (2004)				

Areas most likely to experience secondary development include undeveloped areas (e.g., open space, forested, etc.) in the vicinity of improved interchange locations along the Section 100 corridor. Typically, these areas would also be zoned accordingly to accommodate future development. All undeveloped areas in the vicinity of Section 100 interchanges
(I-895/I-95, I-695/I-95 and MD 43/I-95) were identified as areas potentially at risk for future secondary development.

Legend

- Residential
- Commercial
- Industrial
- Open Space
- Mining
- Forested
- Institutional
- Agricultural
- Wetlands
- Water

SCEA Boundary

Study Area

Proposed Ridge Road Elementary School

Proposed Fullerton Water Treatment Plant

Honeygo Blvd. Extended

Proposed Crossroads Elementary School

I–95 Improvements "Section 200"

Perry Hall Blvd. Widening

Proposed Nottingham Middle School

Philadelphia Road Widening

Yellow Brick Road Extended

Md. 43 Extended

Ebenezer Road Realignment

695 BALTIMORE BELTWAY

HARFORD ROAD

PUTTY HILL AVE

WHITE MARSH BLVD

SILVER SPRING ROAD

JOPPA RD

FORGE ROAD

BELAIR ROAD

BRADSHAW ROAD

JOHN F. KENNEDY MEMORIAL HIGHWAY

PHILADELPHIA ROAD

PULASKI HIGHWAY

JOPPA FARM ROAD

PERRY HALL BLVD.

ROSSVILLE BLVD

MARTIN BLVD

MIDDLE RIVER ROAD

BIRD RIVER ROAD

EBENEZER ROAD

NORTH POINT BLVD

YORK ROAD

LOCH RAVEN BLVD

KENWOOD AVE

Baltimore City / Baltimore County

45 147 542 1 7 40 43 95 895 695

1 Mile 0.5 Mile 0 1 Mile

N

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

FIGURE IV–8
SCEA – Future Land Use

Maryland Transportation Authority

Source: 2010 Master Plan, Baltimore County /Proposed Land Use
I–95 Master Plan

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Two undeveloped areas are in the vicinity of I-895/I-95 Interchange. One forested area is adjacent to I-95 immediately south of the interchange. The other forested area extends along Moores Run, in the vicinity of I-895/I-95 Interchange. The *2010 Master Plan* depicts the forested area adjacent to I-95 as residential land use in the future time frame. Any secondary development (e.g., expansion of nearby residential areas) that may occur in this area would be consistent with the Master Plan. The other undeveloped area along Moores Run has natural environmental features that may limit the potential for future development of this area due to natural environmental resource constraints, including Moores Run and associated wetlands and riparian stream buffer. These types of natural resources are protected by various federal, state and local laws/regulations. This forested area therefore does not have substantial potential to accommodate future development.The majority of undeveloped land in the vicinity of the I-695/I-95 Interchange is located in the northeast and southeast quadrants of the interchange. Although these lands are currently forested areas, the *Master Plan 2010* future land use mapping depicts these areas as residential. It is therefore, possible that residential secondary development may occur in these areas.

The northeast quadrant of the MD 43/I-95 Interchange is another area that may experience secondary development effects. The majority of undeveloped land in the vicinity of this interchange quadrant consists of forested land. This forested area is located immediately south of existing mining/industrial operations. The *2010 Master Plan* depicts this area as industrial land use in the future time frame, therefore, this area has the potential to experience secondary development affects consistent with industrial land use.

The assessment of future land use also involved consideration of planned development areas as identified in the *2010 Master Plan* (Baltimore County Council, 2000). According to the Plan, land use changes would occur mostly in the Perry Hall-White Marsh Growth Area, converting existing forested, agricultural, and open space to residential land use. The proposed Fullerton Water Treatment Plant, west of Perry Hall Boulevard, would result in land use changes from open space and forested to institutional. Several schools are proposed throughout the SCEA boundary, converting existing land use to institutional. In addition, several proposed transportation projects would convert existing commercial, forested, open space, and residential land use to transportation land use. I-95 improvements north of the Section 100 study area (referred to as "Section 200") would have minimal effect on land use, since most improvements are anticipated to occur along an existing transportation corridor. Please refer to ***Figure IV-7*** for future land within the SCEA boundary.

According to the *Master Plan 2010*, the industrial, service, and commercial core of the Perry Hall-White Marsh Growth Area is the fastest growing employment area in the County. Proposed residential development areas in Growth Area include over 400 acres west of I-95. This would convert existing forested and agricultural areas to residential. The east side of I-95 offers an additional 200 acres of future residential development, which would allow for an additional 1,500 units. Proposed development in this area would primarily change open space and forested areas to residential use. Since 1990, White Marsh residential activity has represented 18 percent of the total County market. The Philadelphia Road corridor is zoned primarily for light manufacturing uses with heavier business zoning along Pulaski Highway. Large portions of the western side of Philadelphia Road are zoned for residential development. It is anticipated that the completion of infrastructure, especially Yellow Brick Road and the extension of Campbell Boulevard will spur new development. With good access to the interstate system, the Fitch Avenue Industrial Area provides opportunities for additional industrial development.

The *Master Plan 2010* also identifies future transportation projects within the SCEA boundary, which include:

- Realigning Ebenezer Road to Cowenton Avenue,
- Widening the Baltimore Beltway from I-83 to I-95,
- Constructing Honeygo Boulevard from Ebenezer Road to Belair Road,
- Constructing Campbell Boulevard from Philadelphia Road to Pulaski Highway,
- Widening Philadelphia Road from Campbell Boulevard to Cowenton Avenue,
- Upgrading White Marsh Boulevard from Bucks School House Road easterly, and
- Widening Perry Hall Boulevard from Rossville Boulevard to Honeygo Boulevard.

The *Honeygo Plan* (Baltimore City Council, 1994), adopted in 1994, promotes the development of traditional neighborhoods. Concurrent with the adoption of the *Honeygo Plan*, the Baltimore County Council created the Honeygo Overlay Districts. All land within these districts are subject to special regulatory requirements and design standards. Another major private development that is planned near the SCEA boundary is the Middle River Employment Center (MREC). The MREC site is located southeast of MD 43, predominantly on the east side of I-95. This site would convert existing forested and mining land use to commercial use. The planned MREC is expected to attract approximately 10,000 to 15,000 new jobs to the region.

Future development within Baltimore City consists mainly of re-urbanization and renewal of blighted neighborhoods. Therefore, future land use would remain similar to existing land use. According to the *Baltimore City Economic Growth Strategy* (Baltimore City Department of Planning, 2000), future development within the vicinity of the SCEA boundary consists of the East Baltimore Development, which will result in 2,000 new/rehabilitated housing units and a two million square foot bio-technology research park.

d. Conclusions

Areas most likely to experience secondary development include existing undeveloped areas (e.g., open space, forested, etc.) in the vicinity of improved interchange locations along the Section 100 corridor. Existing undeveloped areas in the vicinity of Section 100 interchanges that show conflicting future land uses have been identified as areas that may experience secondary affects.

An assessment of future land use according to the *Master Plan 2010* determined that the most substantial change in land use in Baltimore County would be the development of residential areas. The residential developments expected within the SCEA boundary correspond to those identified in the *Master Plan 2010.* In addition to these residential developments, transportation improvements have been identified within the SCEA boundary. There are also small commercial developments planned as well as some institutional uses. Other public service amenities could influence the rate of development in the SCEA boundary. The proposed Fullerton Water Treatment plant could allow for more of the SCEA boundary to be serviced with public water supply.

Land use is not anticipated to change substantially in the SCEA boundary within Baltimore City. Land use within the City limits consists mainly of urbanized areas, and future development would concentrate on revitalization.

This section reflects a preliminary comparison of the Build Alternates. It is expected that this section will be modified and expanded before the EA is circulated for public review and comment.

4. SCEA Resource Effects

a. Surface Water/Aquatic Habitat

Numerous sources were consulted for readily available data regarding historic surface water quality data for the SCEA from the past time frame (1963) to the present time. These included:

- EPA's STORET Program, which did not have enough data to conduct a trends analysis, and
- U.S. Geological Survey-Water Resource Division's QWDATA Program, which did not have enough data available on water quality to encompass the SCEA boundary.

The following data sources had readily available water quality data for the SCEA timeframe: Maryland Biological Stream Survey (MBSS 2000), the Baltimore County Department of Environmental Protection and Resource Management (DEPRM), DNR Tributary Basin Quality Indices, and the *Master Plan 2010*. Please refer to ***Table IV-18*** for sub-watersheds that were included in the SCEA analysis.

Table IV-18. Sub-Watersheds Within the SCEA Boundary

Tributary Basin	Watershed	Sub-Watershed
Upper Western Shore	Gunpowder River	Little Gunpowder Falls
	Gunpowder River	Lower Gunpowder Falls
	Gunpowder River	Middle River - Browns
	Gunpowder River	Bird River
	Gunpowder River	Gunpowder River
Patapsco-Back River	Patapsco River	Back River

Past: Suburban expansion from Baltimore City contributed to an increase in the County's population from 1950 to 1970. Baltimore County then embarked on an aggressive growth management program beginning in the late 1960s. In 1975, more than 240,000 acres, or 65 percent, of the County was down-zoned into four Resource Conservation (RC) Zones. The RC zones accounted for 87 percent of the three reservoir watersheds. During the past decades of rapid urbanization, Baltimore County focused on protection of the regional water supply reservoirs, which then set the stage for more comprehensive initiatives in the following decades (DEPRM, 2002).

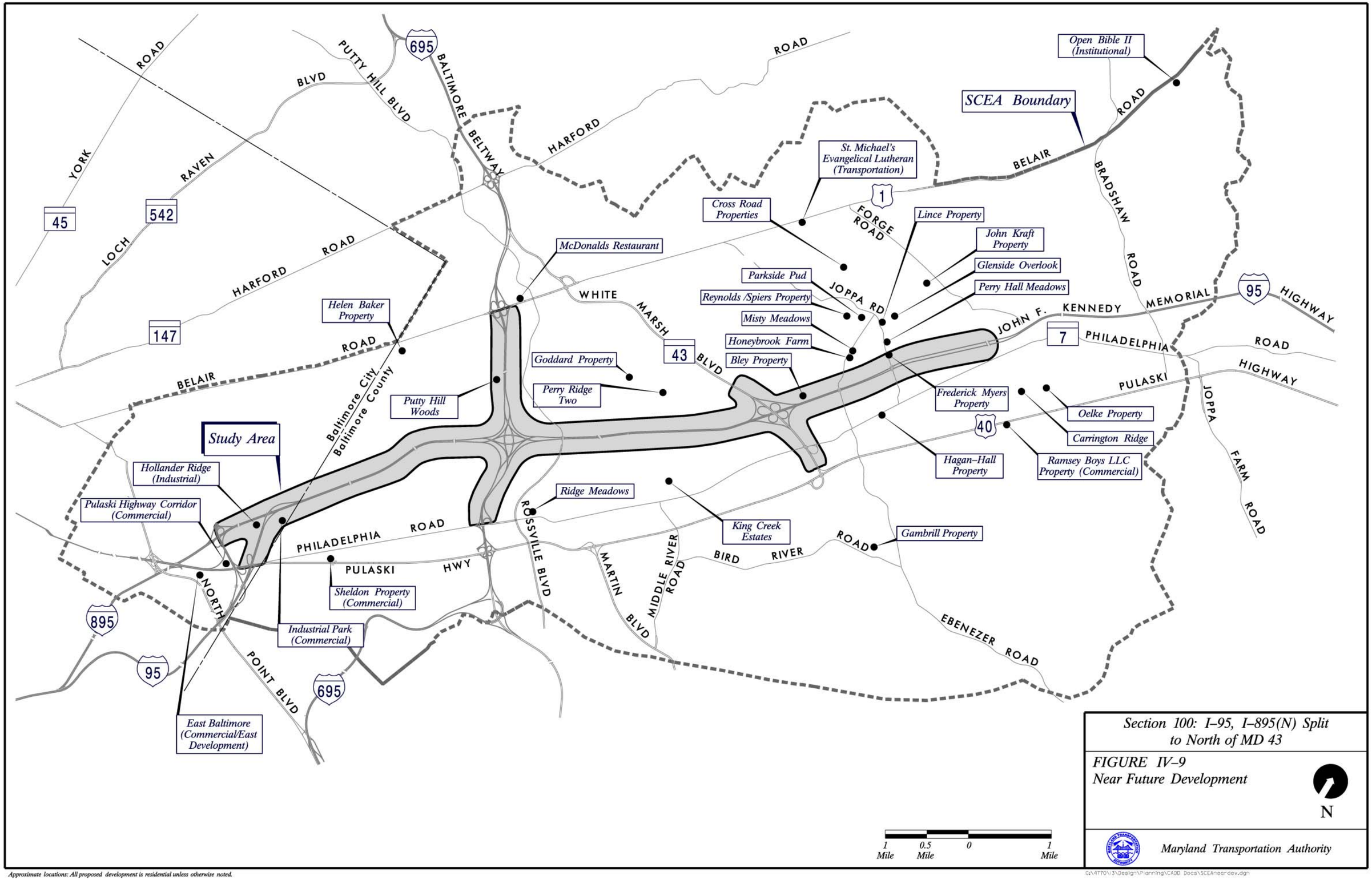
Trend analysis was conducted at the tributary basin level because water quality data was available at this level for both Baltimore County and Baltimore City (***Figure IV-9***). These tributary basins included the Upper Western Shore and the Patapsco-Back River.

Please refer to ***Table IV-18*** for watersheds/sub-watersheds located within each tributary basin. The DNR – Chesapeake Bay Water and Habitat Quality Program has collected water quality samples in Maryland tributaries since 1985 (data was not available prior to 1985).

For this SCEA analysis, the following water quality parameters were investigated: total nitrogen, total phosphorus, and total suspended solids. The DNR methodology categorized stream health related to nutrient data as good, fair, poor, or very poor. Streams rated "good or fair" are considered healthy compared to reference streams within the vicinity of the area. Poor and very poor streams are considered unhealthy compared to reference streams. The following results were reported for the tributary basins located within the SCEA boundary:

Upper Western Shore Tributary Basin

Since 1985, total nitrogen concentrations in this basin are on average "good", with most sampling sites reporting no trend or improving quality. For example, the Lower Gunpowder River reported an improving trend of 31 percent. Similarly, total phosphorus concentrations on average ranked "good", with improving quality. Total suspended solids were "good" with the exception of the Lower Gunpowder River, which ranked "poor" and reported no trend since 1985.



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

FIGURE IV–9
Near Future Development

Maryland Transportation Authority

Approximate locations: All proposed development is residential unless otherwise noted.

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Patapsco-Back River Tributary Basin

On average, total nitrogen concentrations ranked "fair" to "poor" in this basin. Total phosphorus concentrations were "fair" on average. Although Back River reported "poor" conditions for both total nitrogen and phosphorus concentrations, there was an overall improving trend in quality since 1985. Total suspended solids on average were considered "good" and reported an improving quality trend. However, Back River reported "fair" levels and no trend since 1985.

Present: The proposed alternates would increase impervious areas. Impervious areas increase the amount of runoff that is discharged into receiving streams. The Build Alternates would also impact between 11,114 and 15,956 linear feet of Waters of the Untied States (WUS). These direct impacts would act in addition to, or in conjunction with, other impacts to surface water resources from other cumulative projects that would occur within the SCEA boundary. Other impacts would include those development projects that are proposed within the next five years, as listed in ***Table IV-17***.

The DNR has initiated the Maryland Biological Stream Survey (MBSS), which is an ongoing effort to catalog conditions in Maryland streams. In-stream habitat is based on the value of habitat for the fish community. The higher the in-stream habitat value, the greater diversity of habitat variation and particle size. Higher scores indicate a variety of habitat types and particle sizes. The Fish Index of Biotic Integrity (IBI) is a quantitative rating of the health of the fish assemblage found at each site. Higher diversity of native fish species is often associated with better stream quality. In streams where substrate types are favorable but flows are so low that fish are essentially precluded from using the habitat, low scores are assigned. The Benthic IBI score is a quantitative rating of the health of the macro-invertebrate assemblage at each study. As with Fish IBI values, the higher the Benthic IBI rating, the better the stream quality (MBSS, 2002).

MBSS sampling (2000-2002) indicates that some of the watersheds within the SCEA boundary are listed by Section 303(d) of the Federal Water Pollution Control Act as being impaired by at least one pollutant. MBSS sampling sites were not available for all watersheds located within the SCEA boundary. This fact, as well as the fact that all locations (with the exception of BIRD-107 and BACK-111) resulted in "poor" Fish IBI water quality indicators, led to the conclusion that streams within the SCEA area are stressed as compared to reference streams (***Table IV-19***). ***Figure IV-9*** identifies the locations of the MBSS sampling sites within the SCEA boundary.

Table IV-19. MBSS Results Within the SCEA Boundary

Location	Site #	pH	In-stream Habitat	Fish IBI	Benthic IBI
Back River					
Stemmers Run	BACK-110	8.6 (acceptable)	13.0 (Suboptimal)	1.44 (Poor)	1.67 (Poor)
Stemmers Run	BACK-105	8.3 (acceptable)	11.0 (Suboptimal)	2.11 (Poor)	2.33 (Poor)
Redhouse Creek	BACK-111	7.91 (acceptable)	6.0 (Marginal)	3.0 (Fair)	1.86 (Poor)
Bird River					
White Marsh Run	BIRD-101	7.3 (acceptable)	12.0 (Suboptimal)	2.33 (Poor)	2.33 (Poor)
Honeygo Run	BIRD-107	7.4 (acceptable)	13.0 (Suboptimal)	3.22 (Fair)	2.11 (Poor)

Source: Maryland Biological Stream Survey (MBSS) 2002 Data

Future: The proposed private development projects within the SCEA boundary would have a greater overall impact to surface water within the SCEA boundary than the Section 100 Project. Proposed improvements to I-95 north of the study area (Section 200), have the potential to impact surface water/habitat. The extension of MD 43 will impact a tributary of White Marsh Run. The widening of MD 7 will also impact the mainstem of White Marsh Run, north of the Campbell Boulevard/MD 7 intersection. In addition, the Green Line Transit study to White Marsh could impact the mainstem of White Marsh Run, south of Honeygo Boulevard.

With an expected increase in population and development density, surface water impacts would increase and mitigation of these impacts would be required if water quality is to remain equal to or greater than current levels. To minimize further degradation of surface water/aquatic habitat, the *Master Plan 2010* has identified action items that are applicable to protecting streams in the future time frame. They include:

- Ensuring the inclusion of stream protection policies in all community plans,
- Encouraging the use of "Low Impact Development" techniques for development site design in order to minimize impervious surfaces, reduce stormwater runoff and time of concentration of the runoff, and increase the use of functional landscaping, and
- Continuing the design and construction of stream restoration projects, based on natural channel stability concepts.

Mitigation requirements of the proposed improvements within Section 100 would include the restoration of degraded channels in the study area to compensate for impacts to surface water/aquatic habitat.

Conclusions: There has been an overall improvement of water quality in the Upper Western Shore and Patapsco-Back River basins since the mid 1980s due largely to the reduction in point source nitrogen and phosphorus loads, which is in direct response to Federal and State initiatives to improve water quality.

The secondary and cumulative effects of all proposed and/or potential developments (highway and non-highway) to fisheries and water quality of the watersheds within the SCEA boundary would add additional stressors on water quality and watershed stability. Furthermore, Baltimore County has received future subdivision and other residential development activities within the SCEA boundary. Collectively, these developments would be expected to increase non-point source (NPS) pollutant loadings to surface waters within the SCEA boundary.

To minimize further degradation of surface water/aquatic habitat, a number of laws and regulations are applicable to preserving these resources in the future time frame. They include:

- Clean Water Act, Section 404 (CFR 33.26.1344),
- Clean Water Act, Section 401 (Water Quality Certification) (CFR 33.1341),
- Maryland Waterway Construction Statute (COMAR 26.17.04),
- National Pollutant Discharge Elimination System (NPDES), and
- Protection of Water Quality, Streams, Wetlands and Floodplains (Baltimore County Code, Sec. 14-331 to 14-350).

These laws and regulations will serve to minimize impacts for both the project as well as future developments within the SCEA boundary.

b. Forests/Terrestrial Habitat

Readily available data regarding forest habitat was available for portions of the SCEA boundary as well as overall County trends. The *Forest and Green Infrastructure Loss in Maryland 1997-2000* (DNR, 2000) provided information for present day forest loss/gains for Baltimore County. In addition, aerial photography was reviewed from 1960, 1972, and 2000 to assess the amount of forest loss/gain from 1963 to the present. Projected future forest habitat impacts (to the future time frame) were projected based on increased population projections and proposed development.

Although the forested areas were reviewed from both Baltimore City and Baltimore County, the majority of forested areas within the SCEA boundary are located within Baltimore County. Data availability for past trends in forest cover within Baltimore City was not readily available. However, past Master Plans of Baltimore City were reviewed to determine past forest cover located within the City limits.

Past: Historic aerial photography for the years 1960 and 1972 were obtained from the Baltimore County Office of Planning to determine the historical extent of forest habitat in

the SCEA boundary. Aerial photography was not available for Baltimore City for past land use, therefore past Baltimore City Master Plans were reviewed for past land use.

Historically, impacts of human development have adversely affected forested areas within the SCEA boundary. Forest impacts were most extensive between 1960 and 1970, when population increases were substantial in this area and coincided with the opening of I-95. During this time period, a substantial amount of forested areas were lost. Within the SCEA boundary, forest depletion was most extensive within the White Marsh area. Most development included land use changes from: forested to residential; forested to commercial; open space to commercial; industrial to residential and commercial; agricultural to residential and commercial; and mining to residential and commercial. ***Table IV-20*** lists past development initiatives that have impacted forested areas within the SCEA boundary.

The majority of Baltimore City within the SCEA boundary was urbanized with mixed residential land uses. However, forested areas existed adjacent to parklands. This is most evident along Moores Run and Herring Run Parks.

Table IV-20. Past Development Impacts to Forested Habitat

Year	Development/Action
1965	In 1965, the largely undeveloped northeast corridor was identified by Baltimore County as the preferred site for intensive development. A town center was proposed to be located west of Belair Road at the planned intersection of White Marsh and Walther Boulevards.
1968	Essex Community College opened on the former Mace family estate. This tract of land previously consisted of both agricultural and forested land use.
1969	In December 1969, Franklin Square Hospital opened next to the Essex Community College. This tract of land previously consisted of both agricultural and forested land use.
1969	In 1969, a planning analysis of regional growth found development potential in the northeast brought about by the construction of I-95. The County was planning a series of arterial roads traveling in a northeasterly direction from Baltimore County that would pass through the Campbell land. The County agreed to move the planned White Marsh town center east, to be developed on 1,500 acres of forested land on the Campbell land.
1972-1981	The planning and development of the White Marsh Mall occurred, with the Rouse Company as owner and developer on land rented from Nottingham. In July 1973, Sears committed as an anchor store. In 1981 most stores opened. Most of the land prior to this development was categorized as mining or forested.

Source: Baltimore County: The History of White Marsh (2002)

Present: Presently, Baltimore County supports approximately 146,732 acres of forest and tree cover (38.3 percent), from extensive forest blocks greater than 5,000 acres, to forest patches of 100 acres or less, to groups of trees in community parks, gardens, and streetscapes. According to DEPRM, a 2000 Landsat satellite analysis reveals a pattern of highly fragmented forest cover with the largest forest blocks mainly on public sites. The remaining forest cover is widely scattered in numerous forest fragments. The

significance of this distribution can be appreciated in the context of the natural functions of forests, and the degree to which these functions are impaired by fragmentation.

The SCEA boundary encompasses approximately 45,000 acres. An analysis of existing land use (DNR GIS Technology Toolbox, 2001) indicates that approximately 17 percent of this area is forested. Most forested areas within the SCEA boundary are approximately 15 to 100 acres in size, scattered throughout the landscape. Larger forested tracts occur in the northern section of the SCEA boundary. There are limited forested blocks remaining within the SCEA boundary in Baltimore City. Forested tracts within the City are primarily located within designated parklands, such as Moores Run Park, Herring Run Park, and Franck C. Bocak Park. The remaining forested areas in the City will most likely remain undisturbed from development activities.

An additional study was conducted by the DNR that quantified forest loss for the counties of Maryland from 1997 to 2000 (DNR, 2000), Forest and Green Infrastructure Loss in Maryland, 1997-2000) (***Table IV-21***). Although the time frame of this particular analysis would not be suitable for trends over the entire SCEA time frame, it can be considered a representative analysis of the present time frame. For the sampling period selected for this study, Baltimore County ranked seventh for total forest loss of all counties of Maryland, and Baltimore City ranked eighteenth.

Table IV-21. Converted Forests in Baltimore County and Baltimore City

Location	Acres of Land Converted From Forest to Development (1997-2000)	1997 Acreage of Forest Land	% of Forest Converted to Development (1997-2000)
Baltimore County	2,133	127,866	1.7%
Baltimore City	304	3,732	8.1%
Source: Forest and Green Infrastructure Loss in Maryland 1997-2000			

Direct forest/terrestrial habitat impacts of the proposed improvements would range from 140 to 190 acres. ***Figure IV-6*** identifies forested areas that are presently within the SCEA boundary. Direct impacts would involve the conversion of habitat to impervious road surfaces and/or associated roadway infrastructure features (e.g., SWM facilities).

Most of the proposed development within the SCEA boundary that would occur within the next five years would be within areas that are already developed. Once developed, the King Crests Estates, located immediately north of King Avenue, would convert existing forested land use to residential land use (approximately three acres). Development in the Honeygo area also has the potential of converting forested land to other land uses.

Future: Trends analysis show that development pressures may result in encroachment to forested areas within the SCEA boundary. Needs of future populations could impact additional forested areas due to increased development in Baltimore County.

Baltimore County enforces the Maryland Forest Conservation Act, which protects existing forest land from private development activities and/or requires minimization and mitigation. This State law is implemented at the County level. Forested areas are not anticipated to decrease in Baltimore City since these areas are primarily located within parkland areas and are therefore protected under other County and State regulations.

Based on an overlay analysis of future development and existing forested land, the proposed Cowenton Avenue park site would be developed within existing forested areas along the west side of I-95, south of Joppa Road. This would transform this parcel of land to recreational land use. However, recreational plans for this site would not require the removal of forested areas within the entire parcel. Furthermore, the proposed Fullerton Water Treatment Plant, which would be located south east of where Route 1 crosses over White Marsh Boulevard would also impact existing forested areas. Land use in this area would be converted to institutional use. Approximately 40 acres of forested areas would be impacted on the 127-acre site. The proposed Section 200 Project also has the potential of substantially impacting forested areas along I-95.

Conclusions: Development over time would convert forested areas and would continue to require mitigating practices. Private developers must comply with applicable Federal, State, and County regulations governing forest conservation, which include: State Forest Conservation Act, Maryland Reforestation Law, and the Baltimore County Forest Conservation Act. Future effects to forests in the SCEA boundary would be regulated by State and County Forest conservation regulations. In addition, planning efforts and regulations from agencies such as the DNR and DEPRM will help to preserve forests and minimize the effects of forest fragmentation.

c. Floodplains

There was no readily available existing data regarding specific quantitative floodplain impacts within the SCEA boundary from the 1963 time frame to the present. Future impacts to 2025 were projected based on FEMA floodplain maps and regulatory programs now implemented.

Past: Past stresses to floodplains in the SCEA boundary have included reducing the floodplain area with artificial drainage, altering the flood elevation as a result of construction within floodplains, and the impacts of storm drainage structures and increasing impervious area with no quantity controls.

During the original construction of I-95 and I-695, Stemmers Run was channelized and relocated. Consequently, the floodplain was narrowed and straightened to allow for the shift of the stream. Throughout the past time frame, continued development within the Stemmers Run Watershed has increased the severity of storm flow. The floodplain elevation fell when the stream cut a deeper channel. In some areas, severe downcutting may have disassociated the historic floodplain from the channel.

Present: The FEMA-designated 100-year floodplains within the SCEA boundary occur along: Redhouse Creek, Stemmers Run, White Marsh Run, Honeygo Run, Gunpowder River, Moores Run (Baltimore City) and Herring Run (Baltimore City). The natural and beneficial floodplain values of these floodplains would likely be impacted in locations where the Build Alternates fill and/or narrow the floodway and 100-year floodplain. It is anticipated that the Build Alternates would impact between 39 and 45 acres of floodplains. However, regulations currently in place will help to minimize these impacts and will require applicants to obtain permits. These regulations include COMAR 26.17.04 and FEMA floodplain management (CFR 44.01).

To ensure that floodwater impacts due to roadway construction are minimized, drainage structures are required to be designed to maintain the current flow regime and associated flooding (COMAR 26.17.04). Flooding risks would be minimized for all alternates, since all culverts and bridges would be designed to limit the increase in the elevation of the regulatory flood so that structures would not be affected.

Future: Based on overlay analysis, future impacts to floodplains in the SCEA boundary are expected to be minimal. It is not expected that floodplains would be drained in the future. Current Maryland regulations on construction within the 100-year floodplain are relatively stringent, due to safety and property concerns, and are not expected to weaken. SWM practices would mitigate the effects of additional impervious areas within the floodplain drainage area.

Conclusions: It is anticipated that stormwater management practices and Federal, State, and County regulations would minimize the effects to floodplains within the SCEA boundary. Impacts to floodplains would be minimized through COMAR regulations (COMAR 26.17.04) and FEMA CFR 44.01.

Impacts within the floodplain should be mitigated to result in no decrease in flood storage. COMAR regulations are designed to govern construction, reconstruction, repair, or alteration of a dam, reservoir, or waterway obstruction or any change of the course, current, or cross section of a stream or body of water within the State, including any

changes to the 100-year frequency floodplain of free-flowing waters (COMAR 26.17.04). In order to minimize future floodplain impacts, the following could be included in floodplain management:

- Avoiding long and short-term adverse impacts associated with the occupancy and modification of floodplains,
- Avoiding direct and indirect support of floodplain development wherever there is a practicable alternative,
- Reducing the risk of flood loss,
- Promoting the use of nonstructural flood protection methods to reduce the risk of flood loss,
- Minimizing the impact of floods on human health, safety, and welfare,
- Restoring and preserving the natural and beneficial values served by floodplains, and
- Adhering to the objectives of the Unified National Program for Floodplain Management

d. Wetlands

Presently, approximately ten percent of Maryland is classified as a wetland. Wetland trend data for the SCEA boundary was not readily available through existing documented sources for the time period from 1963 to the present; however, Statewide, Countywide and watershed wetland trends were readily available. Wetlands within the Section 100 study area were field delineated in Summer/Fall 2003. In addition, National Wetland Inventory (NWI) mapping and DNR wetland mapping was used for overlay analysis. Proposed direct wetland impacts that would result from the proposed improvements were based on the Proposed ROW for each Build Alternate.

Past: From 1967 to 1968, a Statewide wetland planning survey was conducted. The publication, *Wetlands In Maryland* (Department of State Planning, No. 157, 1973), evaluated all wetlands that were over five acres in size. In addition to field investigations conducted for this survey, aerial photographs were interpreted, indicating that substantial losses occurred during the previous decade. The total estimated loss was calculated by comparing 1968 U.S. Geological Survey maps with those dating back to 1942. Within this period, there was a 15 percent loss of inventoried wetlands, bringing the 1968 estimate of identified nontidal wetlands in Maryland to 74,457 acres. ***Table IV-22*** provides information regarding historical wetland loss, specifically in Baltimore County.

Table IV-22. Summary of Historic Wetland Acreage Loss

County	Historic Acreage (~ 1968)	Acreage (1973)	Acreage Loss (~1968-1973)	Percent Acreage Loss
Baltimore County	27,350	6,242	21,108	77%
Baltimore City	*Data Unavailable*			
Source: Tiner and Burke, Wetlands of Maryland (1995)				

Prior to 1968, Baltimore County reported an average acreage loss of 77 percent, a higher rate than the Statewide average of 58 percent. Causes of historical wetland loss in Baltimore County (which can also be applied to areas within the SCEA boundary) include: clearing of native vegetation and cultivation of agricultural crops; surface mining operations; drainage for crop production; filling for transportation needs, commercial, residential and industrial development; and discharge of agricultural runoff and other land development.

Present: ***Table IV-23*** compares estimated wetland trends for certain wetland classification types in Baltimore County/City. According to Tiner and Burke (1995), Baltimore City has the least amount of wetland acreage of all counties in Maryland due to substantial urbanization. It was reported that Baltimore County accounts for only one percent of the Statewide totals. The dominant wetland type in Baltimore County and Baltimore City is Palustrine.

Table IV-23. Wetland Acreage in Baltimore County and Baltimore City (1995)

County	Estuarine Wetland Acreage	Palustrine Wetland Acreage	Riverine, Lacustrine, Marine Wetland Acreage	Total Acreage	Total Percentage of the State
Baltimore County	2,491	3,384	367	6,242	1.0
Baltimore City	64	155	31	250	0.04
Source: Tiner and Burke, Wetlands of Maryland (1995)					

Limited wetland trends information is available for wetlands within the SCEA boundary. However, DNR has compiled wetland trends information at the sub-watershed level from 1991 to 2000 in terms of net gain/loss (***Table IV-24***).

Table IV-24. Wetland Gains/Losses Per Sub-Watershed (1991-2000)

Tributary Basin	Sub-Watershed	Acres of Permanent Loss	Acres of Permitted Mitigation	Acres of Other Gains	Net Gain/Loss
Upper Western Shore	Little Gunpowder Falls	-0.82	0.51	9.0	+8.69
	Lower Gunpowder Falls	-1.16	1.16	0	0
	Middle River-Browns	-1.63	2.04	0	+0.41
	Bird River	-3.32	5.48	0	+2.16
	Gunpowder River	-0.80	5.73	0	+4.93
Patapsco-Back River	Back River	-5.26	3.03	0.03	-2.2
Source: DNR Surf Your Watershed					

Four out of the six sub-watersheds located within the SCEA boundary have reported a net gain of wetlands from 1991 to 2000, one sub-watershed had no net gain or loss, and one sub-watershed reported a net loss. The Bird River and Gunpowder River Sub-Watersheds reported the most acres of wetland mitigation. Although the Little Gunpowder Falls Sub-Watershed only had 0.51 acres of mitigation, other gains of wetlands resulted in a total gain of 8.69 acres, the highest in the SCEA boundary. The Back River was the only sub-watershed within the SCEA boundary that reported a net loss (–2.2 acres).

Direct impacts to wetlands are expected to occur as a result of the Build Alternates. Wetland impacts would range from 4.3 to 5.4 acres. The majority of wetland impacts would occur in the Back River Sub-Watershed and the Bird River Sub-Watershed. The majority of wetlands impacted are classified as PFO1 (Palustrine Forested), PEM1 (Palustrine Emergent), and POW1 (Palustrine Open Water).

An overlay analysis of NWI and DNR-designated wetlands with near future development determined that there are wetlands potentially at risk within the SCEA boundary. ***Table IV-17*** provides information on near future development within the SCEA boundary. The majority of future wetland impacts are anticipated to occur east of I-95, along the MD 7 corridor. It is anticipated that wetland impacts would be minimized due to the following protective regulations:

- Clean Water Act (33 USC 1344),
- Rivers and Harbors Act (33 USC 403),
- Coastal Zone Management Act of 1972, and
- Protection of Water Quality, Streams, Wetlands and Floodplains (Baltimore County Code, Sec. 14-331 to 14-350)

Future: It is anticipated that percentages of future net wetland loss/conversion within the SCEA boundary would continue to decline since future wetland loss is based on the notion that government regulatory programs would minimize wetland destruction in the future (Tiner and Burke, 1995). Existing wetlands now receive better protection than in the past. Techniques and procedures for protecting Maryland's existing wetlands include: land use regulations, direct acquisition, conservation easements, tax incentives, public education, and the efforts of private individuals and corporations.

There are several sections of the Clean Water Act that pertain to regulating impacts to wetlands. Section 101 specifies the objectives of this Act, which are implemented largely through Title III (Standards and Enforcement), Section 301 (Prohibitions). The discharge of dredged or fill material into WUS is subject to permitting specified under Title IV (Permits and Licenses) of this Act, specifically under Section 404 (Discharges of Dredge or Fill Material) of the Act. Section 401 (Certification) specifies additional requirements for permit review, particularly at the State level. The Rivers and Harbors Act prohibits the creation of any obstruction to the navigable capacity of any of the WUS without specific approval of the US Army Corps of Engineers (USACE). Under the Coastal Zone Management Act (CZMA), coastal states may voluntarily participate in the Federal coastal zone management (CZM) program by preparing comprehensive CZM plans, which provide for the conservation and environmentally sound development of coastal resources. For federal approval, State plans must demonstrate that they provide enforceable standards for protection of specific coastal resources, including tidal and coastal non-tidal wetlands.

Conclusions: Direct impacts to wetlands from the proposed Build Alternates would occur. These impacts would be mitigated with wetland replacement and would be regulated through Federal and State review. Mitigation options may include restoring, enhancing, or creating and preserving wetlands, surface waters, or uplands, or buying credits from a mitigation bank. Cumulative effects within the SCEA boundary are reasonably foreseeable; but it is expected that State and Federal regulations and incentives, as previously identified, would minimize future wetland impacts within the SCEA boundary.

e. Rare, Threatened and Endangered Species

Past: There was no readily available information regarding past records of rare, threatened, or endangered species within the SCEA boundary. However, during the past time frame, an important piece of legislation was enacted to preserve and protect these species, the Endangered Species Act (ESA). The enactment of the ESA assisted in decreasing the rapid rate of species decline across the nation.

Enacted in 1973, the ESA provides significant protection to species that are listed as threatened or endangered by the USFWS. When congress authorized the ESA, they declared that species of "fish, wildlife, and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people." The purpose of the Act is to provide a means whereby endangered species and their ecosystems may be conserved.

Present: Readily available information was obtained regarding endangered and threatened species through coordination with DNR and USFWS. These agencies provided data on State/Federal endangered and threatened species in the Section 100 study area. Data on past impacts to these species was not readily available. Projected qualitative future impacts can only be based on proposed land use and development in relation to the Sensitive Species Project Review Areas (SSPRA), designated by DNR.

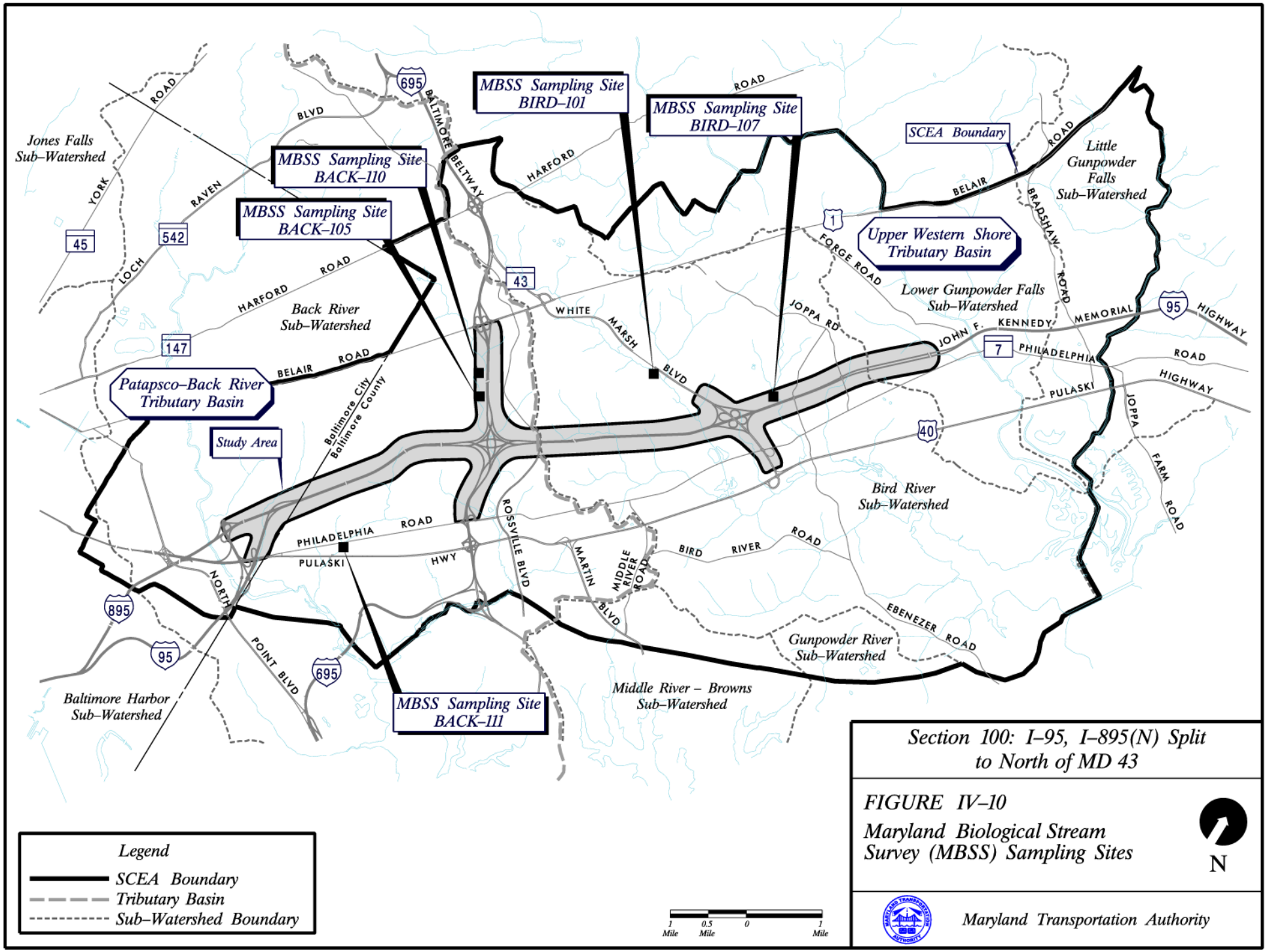
Coordination with the USFWS revealed that there are no known federally proposed or listed endangered species known to exist within the Section 100 study area. Consultation with the Maryland Heritage Division of the DNR revealed the presence of some species that are known to occur within the immediate vicinity of the study area ***(Table IV-25)***. ***Figure IV-10*** provides locations of SSPRAs within the SCEA boundary.

Table IV-25. Sensitive Species Located Within the SCEA Boundary

Common Name	Scientific Name	State Status
Least Tern	*Sterna antillarum*	Threatened (breeding)
Dwarf Iris	*Irsi prismatica*	Endangered
Canada Burnet	*Sanguisorba canadensis*	Threatened
Velvety Sedge	*Carex vestita*	Endangered
Ostrich Fern	*Matteucia struthiopteris*	Rare
Source: DNR Correspondence 2003		

Habitat requirements for the species listed above have been identified through review of taxonomic keys, scientific journals, and websites in addition to ongoing coordination with DNR. The Authority will continue to coordinate with DNR regarding the identification and protection of species throughout the project planning process.

To assess impacts to rare, threatened, and endangered species in the future timeframe, SSPRA were reviewed and overlaid with near future development. This overlay analysis identified areas potentially at risk. There are no SSPRAs located within Baltimore City. There are ten SPPRAs located within the SCEA boundary in Baltimore County. SSPRA represents the general locations of documented rare, threatened, and endangered species in the SCEA boundary.



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

FIGURE IV–10

Maryland Biological Stream Survey (MBSS) Sampling Sites

Maryland Transportation Authority

Source: DNR MBSS (2000)

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These designated areas include various types of regulated areas under the Critical Area Criteria and other areas of concern, including: Natural Heritage Areas, Listed Species Sites, Other or Locally Significant Habitat Areas, Colonial Waterbird Sites, Waterfowl Staging and Concentration Areas, Non-tidal Wetlands of Special State Concern and Geographic Areas of Particular Concern. Therefore, these areas represent State-regulated and designated areas involving sensitive and listed species.

The majority of SPPRAs are located along the outer-limits of the SCEA boundary (north, east, and west) and three SPPRAs are located within the vicinity of White Marsh Boulevard ***(Figure IV-10)***. The overlay analysis with near future development determined that no SSPRAs would be impacted within the present time frame.

Future: An overlay analysis with SSPRAs and future development determined that only one SPPRA would be impacted by future development. The I-95 proposed improvements north of the study area (referred to as "Section 200") could potentially impact one area located on the east side of I-95, north of Forge Road. The Authority would coordinate with local and State agencies in the future to minimize impacts to this potential area of sensitive species.

According to the *Master Plan 2010*, DEPRM takes a broad view of habitat preservation, including not only the protection of rare or significant species, but also assuring the long-term conservation of the habitats of upland, forest, riparian, wetland, and aquatic plants and animals. The *Master Plan 2010* also suggested the following action items:

- Continue to ensure that significant habitats are identified in development plans and continue to seek coordination in protecting them through modification of site designs,
- Seek to increase plant and animal habitat in conjunction with capital improvement projects for shore erosion control, stream restoration, wetland creation, and reforestation, and
- Work in cooperation with governmental and non-profit agencies to assess, protect, restore, and create habitats.

Baltimore County is committed to the preservation of high quality habitats including rare, threatened, and endangered species habitats. Therefore, it is anticipated that the County and existing Federal/State regulations will minimize future and near future impacts.

Conclusions: Endangered and threatened species are protected and regulated by the 1973 Federal ESA, the Maryland Endangered Species Act of 1973, and the 1975 Maryland Nongame and Endangered Species Conservation Act. In addition, Federal and State permitting programs (e.g., wetlands) require the review of public development applications before the development is permitted. Given the existing regulatory framework to protect rare, threatened, and endangered species, and the fact that the majority of planned development within the SCEA boundary has been reviewed to address these requirements, cumulative impacts to State-listed species within the SCEA boundary are not anticipated.

Activities that occur within the SCEA boundary would require coordination with the USFWS and DNR. If a database search finds rare, threatened, or endangered species within one mile of the project area, a species survey would need to be conducted by a qualified specialist and submitted to the appropriate agency (species surveys are required for State-funded proposed projects only). If the survey detects the presence of a rare, threatened, or endangered species, further coordination with DNR would be required.

f. Communities and Businesses

The Baltimore County Public Library system had readily available information regarding the development history of communities within the SCEA boundary, specifically White Marsh, Rosedale, Perry Hall, and Baltimore City.

Past: Communities and businesses have developed along I-95 (after its opening in 1963), and while the character of some of the communities have changed over the years, the community boundaries have remained predominately the same (White Marsh and Perry Hall). A number of roadway improvements have been made in the surrounding vicinity since the 1960s, but the most significant and influential project was the opening of I-95 in 1963.

White Marsh

In the late 1960s Nottingham Properties began analyzing the feasibility of a new town in White Marsh. The intent was to incorporate a variety of land uses and community services, including residential, retail, business, and industrial use. Rosedale grew steadily as a residential suburb since the 1950s.

Rosedale

The first school, a wooden building with only two rooms, was on the corner of Hamilton Avenue and Philadelphia Road. Later, in 1950, the school was transformed into a fire house and hall. Three quarters of the housing units in Rosedale existing in 1990 were built between 1950 and 1979.

Perry Hall

The 1980s brought radical changes to Perry Hall, with housing developments, shopping centers, and thousands of new families converging on a rural, pastoral area. Between 1980 and 1990, Perry Hall's population almost doubled, rising from 13,455 to 22,723 residents. The US Census Bureau estimates that over six thousand housing units were constructed over a ten-year period, mostly in the vast area behind Seven Oaks and Gunpowder Elementary School.

Baltimore City

Prior to 1963, Baltimore City residents were attracted to new housing developments beyond the City's borders, particularly Baltimore County. The City, which had grown in population every year since the mid-18th century, began to decrease the population as adjacent counties experienced tremendous growth. By the late 1960s, Baltimore's inner city was as financially depressed as it had been during the Depression of the 1920s. However, after this economically depressed time period, an increased effort from municipalities and businesses, as well as a tapping of ambitious federal programs, began to spur urban renewal. The municipality managed to revitalize portions of the downtown area and many neighborhoods by renovating some existing buildings and replacing others.

Present: All of the Section 100 Build Alternates would impact communities and businesses. Depending on the alternate, residential displacements would range from two to five, and commercial displacements would range from zero to three. No near future development has been identified that would impact any communities and/or businesses.

Planned development within the SCEA boundary, including proposed communities and commercial facilities, are independent of the proposed improvements to I-95. These proposed projects would not impact existing communities or commercial facilities. Although there would be direct impacts to residential and commercial properties associated with the Section 100 Build Alternates, it is anticipated that secondary and cumulative effects to these resources will be minimal in the near future time frame.

Future: The *Master Plan 2010* identifies planned residential and commercial growth within the vicinity of the SCEA boundary. This planned development is not dependent on the proposed improvements to Section 100. The goal of residential development within the Perry Hall-White Marsh Growth Area is not to generate new development, but rather to actively conserve long-established communities. The *Master Plan 2010* also identifies the following:

- Evaluate the development potential and density of the existing zoning located west of I-95 between White Marsh Run and I-695 and modify the zoning as needed to ensure compatibility with the neighborhood,
- Orient new business development that occurs along Philadelphia Road at Campbell Boulevard, thus limiting increased business traffic for residential communities further south, and
- Consider limiting through-truck traffic on Philadelphia Road south of Campbell Boulevard.

The *Master Plan 2010* also identifies objectives for commercial development within the SCEA boundary. Zoning was changed for many areas within the SCEA boundary to accommodate retail development, which threatened the supply of available land for other employment-generating, non-retail business. Therefore the plan identifies future plans to concentrate new development in established retail areas and emphasize employment-oriented development in non-residentially zoned property.

Conclusions: The proposed Section 100 Project would accommodate future planned growth. Secondary development may occur within areas not currently planned for future development, but are existing undeveloped lands in close proximity to improved interchanges along the corridor. There is the potential for cumulative impacts to communities/businesses from other proposed development planned within the SCEA boundary. Cumulative-type impacts from these projects could potentially include right-of-way acquisition, community cohesion, or visual quality impacts. However, future impacts to communities/businesses would be directly related to local and regional growth.

g. Archaeological Resources

Evaluation of archaeological resources involved overlaying generalized locations of archaeological sites as documented in the MHT database (MHT/Maryland Archaeological Site Survey) with SCEA land use maps to identify resources potentially at risk. The MHT data revealed the general locations of 20 documented archaeological sites within the SCEA boundary (***Table IV-26***). However, exact locations of these sites are confidential and are protected from release under State law. Therefore, these sites have not been depicted on project mapping for inclusion in this document. All general locations of documented archaeological sites were overlaid with proposed development (both near future and future) to determine potential secondary and cumulative impacts to archaeological resources.

Table IV-26. MHT Identified Generalized Locations of Documented Archaeological Sites

Site Number	Site Name	Temporal Period	Associated Landform
18BA51	Forge Road Site	Precontact – no known period	Hilltop/hillside
18BA484	Rockshelter #51	Precontact – no known period	Hillside
18BA418	Moore's Orchard Site #1	M. Archaic – E. Woodland + Historic (19th C.)	Upland flat
18BA481	Moore's Orchard Site #2	Precontact – no known period	Upland flat/hillside
18BA482	Moore's Orchard Site #3	Historic (20th C.)	Upland flat/hillside
18BA50	Cowenton Road Site	Historic (unkn.)	Hilltop/hillside
18BA465	Ridge Site	M. to L. Archaic	Hilltop
18BA464	Spur Site	M. to L. Archaic	Hilltop
18BA463	Knight II Site	Precontact – no known period	Floodplain
18BA462	Knight I Site	Precontact – no known period	Floodplain
18BA140	Tremper Site	Archaic	Upland flat
18BA49	Silver Spring Road II	Precontact – no known period	Upland flat
18BA48	Silver Spring Road I	Precontact – no known period	Upland flat
18BA47	White Marsh Run II	Precontact – no known period	Hilltop/saddle
18BA45	White Marsh Run I	Precontact – no known period	Hilltop/saddle
18BA46	King Avenue Site	Precontact – no known period	Floodplain/terrace
18BA44	Blue Ridge Site	Precontact – no known period	Hilltop/hillside
18BA402	Johnson – Gross House Site	Historic (19-20th C.)	Hilltop
18BA401	Shafer- Tenfel House and Prehistoric Site	Historic (19-20th C.) and precontact – no known period	Hillside
18BA345	Cumberland – Stemmers Site	L. Archaic – E. Woodland	Upland flat/hillside
		Archaeological Sites No Longer Present	

Source: MHT/Maryland Archaeological Site Survey

Past: The Phase I archaeological survey conducted for the Section 100 project determined that eight of the previously identified archaeological resources within the SCEA boundary no longer exist, or do not exist where indicated in the site files (MHT/Maryland Archaeological Site Survey) (***Table IV-25***). Eight sites, 18BA44-18BA51, recorded in the Section 100 APE were identified in a survey of I-95 conducted in the early 1960s (Hunt et al. 1964). Recent testing of these site areas yielded no cultural materials or evidence of archaeological deposits related to the sites (only modern roadside debris was recovered). Apparently the sites identified in the earlier survey did not survive I-95 construction and/or the subsequent residential and commercial development of the project study area.

Present: One archaeological property would be impacted by the Managed Lanes Alternate. This property, known as the Smith Site, is located in the southwest quadrant of the I-695 Interchange and is approximately 0.47 acre in size. This resource was identified and documented as part of the cultural resource studies for the Section 100 Project. Three additional archaeological sites, 18BA160, 18BA514, and 18BA515, were also discovered in conjunction with the Section 100 Project. However, due to their lack of integrity, these sites are non-significant and would not incur any new impacts (i.e., loss of significant data). The General Purpose Lanes Alternate would not impact the Smith Site or any other archaeological site.

Overlay analysis indicated that no other archaeological sites would be affected by near-future development within the SCEA boundary.

Future: Future assessment of historic properties included overlaying generalized locations of archaeological resources with the SCEA future land use map to identify future development activities in close proximity to known archaeological resources. Based on this assessment, two resources, including the Tremper Site (18BA140) and the Rockshelter #51 (18BA484) may potentially be impacted by future development. The Honeygo Boulevard Extension, north of Silver Spring Road, may impact the Tremper Site (18BA140). In addition, the proposed Crossroads Elementary School, located adjacent to the northern perimeter of the SCEA boundary, may impact the Rockshelter #51 (18BA484) archaeological site.

It is important to recognize that this study only includes previously documented sites within the SCEA boundary; that is, archaeological sites currently on record with the MHT/Maryland Archaeological Site Survey. As such, it must be noted that areas beyond the Section 100 APE may also contain sites that have yet to be discovered.

Conclusions: Archaeological sites within the SCEA have been impacted in the past as determined by the Section 100 study, in which eight archaeological resources were no longer present. In addition, archaeological resources would likely be affected by cumulative impacts in the future. However, the following laws and regulations will help to preserve and protect these resources in the future:

- The Department of Transportation Act of 1966, as amended;
- The National Historic Preservation Act of 1966, as amended; 36 CFR Part 800 – Protection of Historic Properties; Executive Order 11593; and
- The Maryland Historical Trust Act of 1990 (Article 83B, §§ 5-607, 5-617 to 5-619, and 5-623 of the Annotated Code of Maryland).

V. SECTION 4(f) EVALUATION

Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 (49 USC 303(c)) requires that "special effort…be made to preserve the natural beauty of the countryside and public parks and recreational lands, wildlife and waterfowl refuges and historic sites." Section 4(f) applies to historic sites and designated publicly owned parks, recreational areas, and wildlife and waterfowl refuges that are determined by the Federal Highway Administration (FHWA) to have national, state, or local significance. Under the Act, the Secretary of Transportation cannot approve a project requiring the "use" of a Section 4(f) property unless "(1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use."

Section 4(f) applies to projects that require approval by the FHWA, or another USDOT agency. It requires that such a project avoid the use of any Section 4(f) resource, as defined above, unless there is no prudent and feasible alternative to that use. If a use must occur, all possible planning and measures to minimize harm to that resource must be demonstrated and documented.

A Section 4(f) "use" is defined as 1) when property from a Section 4(f) site is permanently acquired (fee simple or permanent easement) and incorporated into a transportation project; 2) when there is an occupancy of land (i.e., construction access areas, detours, temporary bridges, replacement of an historic bridge, etc.) that is adverse in terms of the statute's preservationist purposes of preserving the integrity of the resource; or 3) when the proximity impacts from a project are so great that the characteristics which qualify the resource as a Section 4(f) site are substantially impaired.

Section 4(f) coordination was conducted with municipal/state officials for the public parks and recreational areas identified throughout the study area. Although there are a number of public parks and recreational areas located along and immediately adjacent to the proposed alternates for this project, it was determined that neither of the Build Alternates would require the acquisition of park property, and the use and enjoyment of the parks would not be impaired. (See Chapter III Section A-4 and Chapter IV Section A4.) In addition, there are no wildlife or waterfowl refuges within the study area. Therefore, neither of the Build Alternates would result in the use of any Section 4(f)-protected parks or recreational areas, or refuges.

It was also determined that the Build Alternates would not result in a Section 4(f) use of historic sites. As a result of the Section 100 study area investigations, one property, located at 11204 Lilac Lane (BA-3141), was determined eligible for listing in the National Register of Historic Places (NRHP) under Criterion C (see ***Chapter III – D.1***). The property, including the house and grounds, would be unchanged by either of the proposed Build Alternates, and no property would be acquired in the area surrounding the eligible property (see ***Chapter IV - D.1, and Appendix A, Plate 24 and Appendix B, Plate 50***). In all cases, the proposed roadway improvements would have No Effect on the character or use of the residence at 11204 Lilac Lane, as determined in the *Section 100: I-95, I-895(N) Split to North of MD 43 Historic Context and Determination of Eligibility and Effects Report* and concurred upon by the State Historic Preservation Officer (SHPO) in a letter dated << >>(***Appendix C***). Based on this assessment, the Build Alternates would not result in the use of this property.

One of the Build Alternates would use land from an archaeological site – known as the Smith Site (18BA516) – which requires further investigation. However, based on existing information, it appears that the Smith Site would not require preservation in place, and therefore would not be protected under Section 4(f). See 23 CFR §771.135(g)(2).

In conclusion, neither of the proposed Build Alternates would use any Section 4(f) resources, and, therefore, a Section 4(f) approval is not required for this project.

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VIII. REFERENCES

American Association of State Highway and Transportation Officials (AASHTO). 1994. Guide Specifications for Structural Design of Sound Barriers.

Baltimore City Department of Planning. 2000. *Baltimore City Economic Growth Strategy.*

Baltimore County Forestry Board. http://www.bcfb.sailorsite.net/

Baltimore County Office of Planning. 1997 Triennial Review. *10-Year Baltimore County Water Supply and Sewerage Plan 1990-2000.* Baltimore County, Maryland.

Baltimore County Council. February 2000. *Master Plan 2010. Baltimore County, Maryland.*

Baltimore County. October 2002. The History of White Marsh. http://www.bcplonline.org/info/history/hist_wh_history.html

Baltimore County. Office of Community Conservation. Northeast Sector. http://www.co.ba.md.us/Agencies/community/nesector.html

Baltimore County Department of Environmental Protection and Resource Management (DEPRM). 2002. "Managing the Mandates: Baltimore County, Maryland's Experience in Applying the Watershed Approach"

Baltimore County Council. 1994. *Honeygo Plan.*

Baltimore County Public Library Online. Baltimore County History. http://www.bcplonline.org/info/history/local.html

Bowlby & Associates, Inc. August 1998. FHWA Traffic Noise Model®, Version 1.0, Short Course. *Taught by Dr. William Bowlby, P.E. and Dr. Roger L. Wayson, P.E. Brentwood, Tennessee and Orlando, Florida.*

Council of Environmental Quality. Regulations for Implementing NEPA. Cumulative Impacts. 40.CFR.1508.7-8.

Cowardin L.M., V. Carter, F.C. Golet and E.T. LaRoe. 1977. Classification of Wetlands and Deepwater Habitats of the United States. USFWS.

Crowley, et. al. 1976. *Geologic Map of Baltimore County, Maryland.*

Department of Health and Human Services. Poverty thresholds. http://aspe.hhs.gov/poverty/00poverty.htm

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineations Manual*, *Technical Report Y-87-1*, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Environmental Protection Agency. *National Recommended Fresh Water Quality Criteria*, EPA 822-Z-99-001.

Environmental Protection Agency. July 2000. *National Criteria Technical Guidance Manual: Rivers and Streams*, EPA 822-B-00-002.

Environmental Protection Agency. 1999. *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macro-invertebrates and Fish, Second Edition*. EPA 841-B99-002.

Environmental Protection Agency, Office of Air Quality Planning & Standards; *Aerometric Information Retrieval System (AIRS) Data Website*; http://www.epa.gov/air/data/monitors.htm

Environmental Protection Agency; *Guideline for Modeling Carbon Monoxide from Roadway Intersections*; November 1992; EPA-454/R-92-005

Environmental Protection Agency; *User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*; November 1992; EPA-454/R-92-006

Harford County Government. 1996. *Harford County Master Plan*.

Harford County Government. 2000. *Harford County Transportation Plan*.

Hunt et al. 1964. *Archaeology of the Northeast Expressway, between Baltimore and the Susquehanna River*. Report prepared by Alice P. Hunt of the University of Utah, Charles B. Hunt of Johns Hopkins University, and T. Latimer Ford of the Archaeological Society of Maryland, Inc.

Maryland Department of Natural Resources (DNR). 2000. *Maryland Biological Stream Survey* (MBSS). Biological Stream Survey of Maryland Report.

Maryland Department of Natural Resources (DNR) – Chesapeake Bay Water and Habitat Quality Program.

Maryland Department of Natural Resources. February 2001. Monitoring and Non-Tidal Assessment Division, *Maryland Biological Stream Survey Sampling Manual*.

Maryland Department of Environment. *Stormwater Management Guidelines for State and Federal Projects.*

Maryland Department of the Environment, Mobile Sources Control Program; Mr. Mohamed Kahn, (410) 631-4841

Maryland Department of Natural Resources. 2000. *Refinement and Validation of a fish index of Biotic Integrity for Maryland Streams*.

Maryland Department of Natural Resources. 2000. History of Maryland State Parks. http://www.dnr.state.md.us/publiclands/sfpshistory.html

Maryland Department of Natural Resources. 2000. DNR GIS Technology Toolbox.

Maryland Department of Natural Resources. 2003. Tributary Basin Quality Indices.

Maryland Department of Natural Resources. 2000. *Forest and Green Infrastructure Loss in Maryland 1997-2000.*

Maryland Department of Planning. 2000. Population Projections. (http://www.mdp.state.md.us)

Maryland Historical Trust (MHT). 2000. *Standards and Guidelines for Architectural and Historical Investigations in Maryland*. Department of Housing and Community Development, Crownsville, Maryland.

Maryland State Highway Administration. Environmental Justice Guidelines for MD State Highway Administration's Projects. August 2001.

Maryland Transportation Authority. 2004. *Section 100: I-95, I-895(N) Split to North of MD 43 Alternatives Retained for Detailed Study (ARDS) Report.* McCormick Taylor, February 2004.

Maryland Transportation Authority. 2004. *Section 100: I-95, I-895(N) Split to North of MD 43 Historic Context and Determination of Eligibility and Effects Report*. A.D. Marble & Company, February 2004.

Maryland Transportation Authority. 2004. *Section 100: I-95, I-895(N) Split to North of MD 43 Natural Environmental Technical Report.* McCormick Taylor, February 2004.

Maryland Transportation Authority. September 2003. *Section 100: Section 100: I-95, I-895(N) Split to North of MD 43 Purpose and Need Statement.* McCormick Taylor, September 2003.

Maryland Transportation Authority. February 2004. *Section 100: I-95, I-895 to North of MD 43 Socio-economic Technical Report.* McCormick Taylor, February 2004.

Maryland Transportation Authority. 2004. *Initial Site Assessment.* A.D. Marble & Company, February 2004.

Maryland Transportation Authority. 2004. *Section 100: I-95, I-895 to North of MD 43 Noise Quality Technical Analysis Report.* McCormick Taylor, February 2004.

McCormick, Taylor & Associates. November 2003. *Wetland Delineation Report*.

National Park Service. 1983. Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines. Part IV. Federal Register 48(190):44716-44740 (September 29, 1983).

National Technical Committee on Hydric Soils. 1990. *Wetland Delineation Manual*.

Natural Resources Article, Section 5-103. 1988. Maryland Reforestation Law.

Natural Resources Conservation Service (NRCS), Soil Conservation Service (SCS). 1976. *The Soil Survey of Baltimore County.*

Shaffer, G.D. and E.J. Cole. 1994. *Standards and Guidelines for Archaeological Investigations in Maryland.* Maryland Historical Trust Technical Report Number 2. Crownsville, Maryland.

Title 23 of the Code of Federal Regulations (CFR), Part 772 (23 CFR Part 772) – Procedures for Abatement of Highway Traffic Noise and Construction Noise.

Tiner, R.W., and D.G. Burke. 1995. Wetlands of Maryland. U.S. Fish and Wildlife Service, Ecological Services, Region 5, Hadley, MA and Maryland Department of Natural Resources, Annapolis, MD. Cooperative publication. 193 pp. plus Appendices.

US Army Corps of Engineers, New England Division. *The Highway Methodology Workbook Supplement: Wetland Functions and Values – A Descriptive Approach*.

U.S. Census Bureau. 1990 Census (http://factfinder.census.gov/servlet/BasicFactsServlet).

U.S. Census Bureau. Census 2000. (http://factfinder.census.gov/servlet/BasicFactsServlet).

US Department of Agriculture, Soil Conservation Service (SCS). 1967. Soil Survey of Prince George's County, Maryland. Government Printing Office, Washington, D.C., USA.

US Department of Agriculture, Natural Resources Conservation Service (NRCS). 1992. List of Prime and Statewide Important Farmland Soils.

US Department of Agriculture, Natural Resources Conservation Service (NRCS). 1981. Farmland Protection Policy Act (FPPA). Government Printing Office, Washington, D.C., USA.

U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning. February 1998. FHWA Traffic Noise Model®, Version 1.0, Technical Manual. *Final Report*. FHWA-PD-96-010. DOT-VNTSC-FHWA-98-2.

U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning. January 1998. FHWA Traffic Noise Model®, Version 1.0, User's Guide. *Final Report*. FHWA-PD-96-009. DOT-VNTSC-FHWA-98-1.

U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning. June 1995. *Highway Traffic Noise Analysis and Abatement, Policy and Guidance.*

U.S. Department of Transportation, Federal Highway Administration, Office of Environmental Policy. 1973. Fundamentals and Abatement of Highway Traffic Noise. *Textbook and Training Course prepared and presented by Bolt Beranek and Newman, Inc.*

U.S. Department of Transportation, Federal Highway Administration. *A Guide to Visual Quality in Noise Barrier Design.*

U.S. Department of Transportation, Federal Highway Administration. *Noise Barrier Design Handbook.*