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.

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.

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

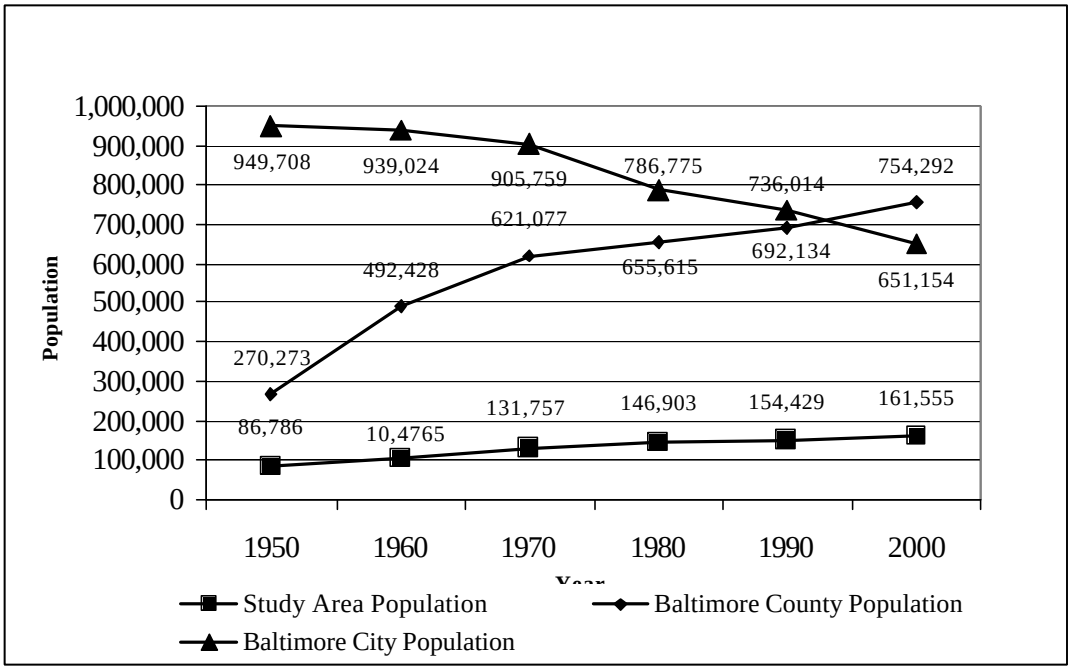
2003 - Construction completed for MD 7 widening from MD 43 to Campbell Boulevard

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.

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.

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.

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.

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).