



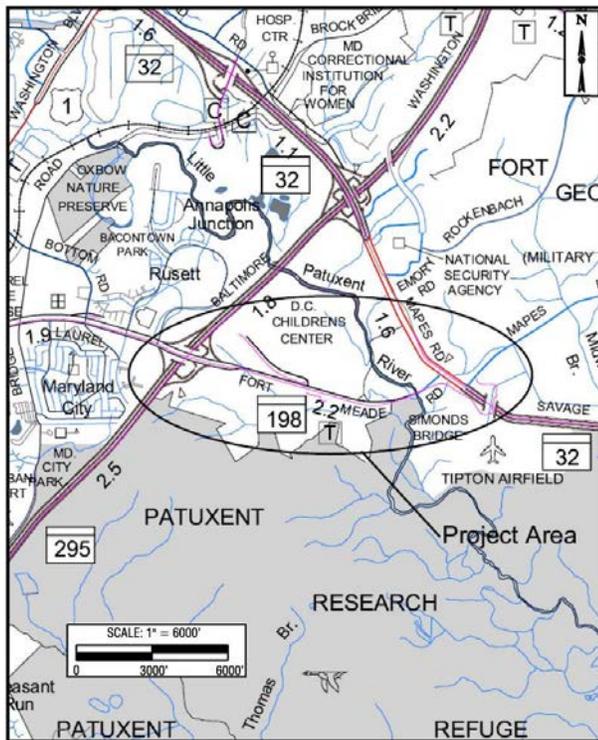
ENVIRONMENTAL ASSESSMENT
&
DRAFT
SECTION 4(f) EVALUATION

SHA Project Number AA510A11



MD 198 Project Planning Study

From MD 295 to MD 32 in Anne Arundel County



February 2015

prepared by:

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

**FEDERAL HIGHWAY ADMINISTRATION
DELMAR DIVISION**

MD 198 PROJECT PLANNING STUDY

MD 295 to MD 32
Anne Arundel County, Maryland

ADMINISTRATIVE ACTION

ENVIRONMENTAL ASSESSMENT

&

DRAFT

SECTION 4(f) EVALUATION

**U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
and
MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY
ADMINISTRATION**

Submitted Pursuant to: 42 U.S.C. 4332(2)(c); 49 U.S.C. 303
23 CFR 771, 23 CFR 774 and CEQ Regulations (40 CFR 1500 et seq)

Summary

SUMMARY

A. Administrative Action

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

B. Additional Information

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

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C. Description of Proposed Action/Purpose and Need

The purpose of the MD 198 project is to improve the existing capacity and traffic operations, and to increase vehicular and pedestrian safety along MD 198, while supporting existing and planned development in the study area. MD 198 provides direct access to the Fort George G. Meade Military Reservation (Fort Meade) from MD 32, MD 295, and generally points south and west of the study area. The Federal Highway Administration (FHWA) and the Maryland State Highway Administration (SHA) are the lead agencies for the project.

Improvements in the study area are needed to address rapid growth and traffic volumes in one of the fastest growing areas in Anne Arundel County. Fort Meade and the National Security Agency (NSA), a tenant of the Fort Meade, have contributed to increased traffic volumes in the area. As a result of the 2005 Base Realignment and Closure (BRAC) process, Fort Meade and the surrounding area are expected to continue to experience considerable growth in traffic volumes. In addition to increased traffic, the study area is expected to continue to see substantial increases in population, housing, and commercial activity as a result of BRAC.

During the planning process of this project, Anne Arundel County Council rezoned the Arundel Gateway parcel immediately adjacent to the MD 198 corridor. In coordination with County staff, the project team completed a traffic sensitivity analysis to assess this

change in trip generation potential along MD 198. The rezoned parcel was shown to generate a much greater amount of traffic when compared to the demographic forecast for the traffic analysis zone in the adopted Baltimore Metropolitan Council Round 7C Cooperative Forecast. This project will address projected operational and safety deficiencies resulting from the expected growth within and adjacent to the project area.

D. Alternatives Retained for Detailed Study

The proposed improvements involve widening MD 198 from a two-lane roadway to a four-lane divided roadway with two through lanes in each direction. The additional width would include a median, on-road bicycle lane, and a shared use pedestrian/bicycle path, from west of the MD 295/MD 198 Interchange to the MD 32/MD 198 Interchange. The western portion of the project includes some minor ramp improvements to the MD 295/MD 198 Interchange. In addition to the widening of MD 198, the project includes a range of improvements to the MD 32/MD 198 Interchange.

Alternatives retained for further study include:

- Alternative 1: No-Build
- Alternative 2: Transportation Systems Management (TSM)
- Alternative 4 Modified: Divided Roadway with Off-Road, Shared-Use Facility and a Sidewalk

The MD 32/MD 198 Interchange Options retained for further study include:

- Option A: Flyover Ramp
- Option C: Diamond Interchange at Existing Interchange
- Option D: Two Bridge

E. Summary of Environmental Impacts

The build alternatives and interchange options will enhance the quality of life in the study area by decreasing traffic congestion and improving the movement of national defense generated travel. The build alternatives and interchange options will also benefit businesses in the area by potentially increasing drive-by business. There will be no impacts to schools, churches, or health care facilities resulting from the build alternatives. Table S-1 contains a comparative summary of impacts associated with the No-Build Alternative, build alternatives, and interchange options. These impacts are briefly described below.

- No residential displacements would be required by any of the alternatives and no commercial displacements would be required by the interchange options; however, a maximum of one commercial displacement would occur with the build alternatives.
- A maximum of 35 commercial parcels and one residential parcel would be impacted by the build alternatives and a maximum of two commercial parcels would be impacted by the interchange options.

- The build alternatives and interchange options would have no adverse or disproportionate impacts to any Environmental Justice communities.
- Alternatives 2 and 4 Modified would have direct impacts to the Baltimore-Washington Parkway, administered by the National Park Service (NPS), which is listed on the National Register of Historic Places (NRHP). The impacts would range from 1.02 to 5.93 acres.
- There are no significant archeological resources that will be impacted by the build alternatives and interchange options.
- The build alternatives would permanently impact between 71 and 459 linear feet of Waters of the U.S. (WUS) and the interchange options would permanently impact between 190 and 252 linear feet of WUS.
- The build alternatives would permanently impact between 0.7 and 1.4 acres of wetlands and the interchange options would impact between 0.9 and 2.6 acres of wetlands.
- Alternatives 1 and 2 would not impact any floodplains within the study area. Alternative 4 Modified would encroach on 0.1 acres and each interchange option would impact 2.4 acres of the 100-year floodplain.
- There would be no project related impacts to fish under any of the build alternatives and interchange options. Instream work is not permitted in Use I streams during the period of March 1st through June 15th, of any given year.
- Woodland impacts range from 4.5 to 19.4 acres for the build alternatives. For the interchange options, woodland impacts range from 4.6 to 5.9 acres.
- The study area contains Green Infrastructure composed of hubs, corridors, and gaps. The build alternatives would impact a maximum of 4.1 acres of hubs, 9.4 acres of corridors, and 3.9 acres of gaps, while the interchange options would impact a maximum of 5.5 acres of hubs and 4.3 acres of gaps.
- There are 37 sites with potential for hazardous materials that could be affected by the build alternatives. Depending on the amount of right-of-way required, further investigations of some or all of the sites could be required and would be conducted prior to acquisition.
- The State/National Ambient Air Quality Standards would not be exceeded by the build alternatives or interchange options.
- Noise Sensitive Areas 03 and 06 would be impacted by Alternative 4 Modified.

Table S-1: Summary of Environmental Impacts

Category	MD 198 Mainline Alternatives*			MD 198 / MD 32 Interchange Options*		
	1	2	4 Modified	A	C	D
Socio-Economic & Cultural Resources						
1. Potential Displacements (No.)						
A. Residential	0	0	0	0	0	0
B. Commercial	0	0	1	0	0	0
Total	0	0	1	0	0	0
2. Properties Affected (No.)						
A. Residential	0	0	1	0	0	0
B. Commercial	0	7	35	2	2	2
C. Fort Meade Property	0	0	1	1	1	1
D. Tipton Airport Authority	0	0	0	1	1	1
E. Federal Lands	0	0	0	1	1	1
F. U.S. Fish & Wildlife Service	0	0	0	1	1	1
G. NPS Property/Historic Site (Baltimore-Washington Parkway)	0	1	1	0	0	0
Total	0	8	38	6	6	6
3. Right-of-Way Required (Acres)						
A. Residential	0	0	0.1	0	0	0
B. Commercial	0	3.1	19.3	0.4	0.4	0.4
C. Fort Meade Property	0	0	0.1	8.3	6.4	7.2
D. Tipton Airport Authority	0	0	0	4.0	4.0	3.7
E. Federal Lands	0	6.7	11	0.05	0.8	0.5
F. U.S. Fish & Wildlife Service	0	0	0	0.05	0.1	0.1
G. Archeological Site(s)	0	0	0	0	0	0
H. NPS Property/Historic Property (Baltimore-Washington Parkway) **	0	1.02	5.93	0	0	0
Total	0	10.82	34.3	12.8	11.7	11.9
Natural Environment						
Wetlands (Acres)	0	0.7	1.87	1.9	0.9	2.6
Wetlands of Special State Concern (Acres)	0	0	0	0	0	0
Total Wetlands (Acres)	0	0.7	1.87	1.9	0.9	2.6
Stream Crossings (No.)	0	1	7	3	3	3
Stream Impacts (LF)	0	71	716	93	190	252
100-Year Floodplain (Acres)	0	0	1.1	2.4	2.4	2.4
Woodland (Acres)	0	4.5	19.4	5.1	4.6	5.9
Baltimore-Washington Parkway** (Acres)	0	1.02	5.93	0	0	0
Potential Hazardous Waste Sites	0	6	33	4	4	4
Cost***						
Preliminary Engineering	\$ 0	\$ 2.5 - \$ 3.2	\$ 9.9 - \$ 12.7	\$ 13.6 - \$ 17.4	\$ 12.8 - \$ 16.4	\$ 10.7 - \$ 17.4
Right-of-way	\$ 0	\$ 1.3 - \$ 2.1	\$ 16.3 - \$ 25.5	\$ 1.0 - \$ 1.6	\$.8 - \$ 1.3	\$ 1.2 - \$ 1.9
Construction	\$ 0	\$ 14.7 - \$ 18.9	\$ 65.9 - \$ 84.3	\$ 90.6 - \$ 116.0	\$ 85.2 - \$ 109.0	\$ 71.7 - \$ 91.7
Total Cost in Millions	\$ 0	\$ 18.5 - \$ 24.1	\$ 92.1 - \$ 122.5	\$ 105.2 - \$ 135.0	\$ 98.8 - \$ 126.7	\$ 83.6 - \$ 107.4

*A complete build alternative for the MD 198 Project Planning Study will include one main line alternative paired with one interchange concept. The total impacts will be the summation of the two pieces.

**The land on which MD 198 crosses the Baltimore-Washington Parkway is owned by the National Park Service (NPS). In addition, the Baltimore-Washington Parkway is listed on the National Register of Historic Places.

***Cost Range includes an inflation adjustment through 2020.

Environmental Assessment Form

The following Environmental Assessment Form is a requirement of the Maryland Environmental Policy Act and Maryland Department of Transportation Order 11.01.06.02. Its use is in keeping with the provisions of 1500.4 (k) and 1506.2 and .6 of the Council of Environmental Quality Regulations, effective July 31, 1979, which recommend that duplication of Federal, State and Local procedures be integrated into a single process.

The checklist identifies specific areas of the natural and social-economic environment which have been considered while preparing this environmental assessment. The reviewer can refer to the appropriate section of the document, as indicated in the “Comment” column of the form, for a description of specific characteristics of the natural or social-economic environment within the proposed project area. It will also highlight any potential impacts, beneficial or adverse, that the action may incur. The “No” column indicates that during the scoping and early coordination processes, that specific area of the environment was not identified to be within the project area or would not be impacted by the proposed action.

ENVIRONMENTAL ASSESSMENT FORM

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
A. Land Use Considerations			
1. Will the action be within the 100 year floodplain?	<u> X </u>	<u> </u>	<u> See Section III. E.3. b. </u>
2. Will the action require a permit for construction or alteration within the 50 year floodplain?	<u> </u>	<u> X </u>	
3. Will the action require a permit for dredging, filling, draining or alteration of a wetland?	<u> X </u>	<u> </u>	<u> See Section III. E. d. </u>
4. Will the action require a permit for the construction or operation of facilities for solid waste disposal including dredge and excavation spoil?	<u> </u>	<u> X </u>	
5. Will the action occur on slopes exceeding 15%?	<u> </u>	<u> X </u>	
6. Will the action require a grading plan or a sediment control permit?	<u> X </u>	<u> </u>	<u> See Section III. E. 1. </u>
7. Will the action require a mining permit for deep or surface mining?	<u> </u>	<u> X </u>	
8. Will the action require a permit for drilling a gas or oil well?	<u> </u>	<u> X </u>	

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
9. Will the action require a permit for airport	_____	<u>X</u>	
10. Will the action require a permit for the crossing of the Potomac River by conduits, cables or other like devices?	_____	<u>X</u>	
11. Will the action affect the use of a public recreation area, park, forest, wildlife management area, scenic river or wildland?	<u>X</u>	_____	<u>See Section III. B. 6. a. & Section IV.</u>
12. Will the action affect the use of any natural or manmade features that are unique to the county, state, or nation?	_____	<u>X</u>	
13. Will the action affect the use of an archeological or historical site or structure?	<u>X</u>	_____	<u>See Section III. D.</u>
B. Water Use Considerations			
14. Will the action require a permit for the change of the course, current, or cross-section of a stream or other body of water?	<u>X</u>	_____	<u>See Section III. E. 3. d.</u>
15. Will the action require the construction, alteration, or removal of a dam, reservoir, or waterway obstruction?	<u>X</u>	_____	<u>See Section III. E. 3. d.</u>

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
16. Will the action change the overland flow of stormwater or reduce the absorption capacity of the ground?	<u> X </u>	<u> </u>	<u> See Section III. E. 3. a. </u>
17. Will the action require a permit for the drilling of a water well?	<u> </u>	<u> X </u>	
18. Will the action require a permit for water appropriation?	<u> </u>	<u> X </u>	
19. Will the action require a permit for the construction and operation of facilities for treatment or distribution of water?	<u> </u>	<u> X </u>	
20. Will the project require a permit for the construction and operation of facilities for sewage treatment and/or land disposal of liquid waste derivatives?	<u> </u>	<u> X </u>	
21. Will the action result in any discharge into surface or sub-surface water?	<u> X </u>	<u> </u>	<u> See Section III. E. 3. a. </u>
22. If so, will the discharge affect ambient water quality parameters and/or require a discharge permit?	<u> X </u>	<u> </u>	<u> See Section III. E. 3. a. </u>

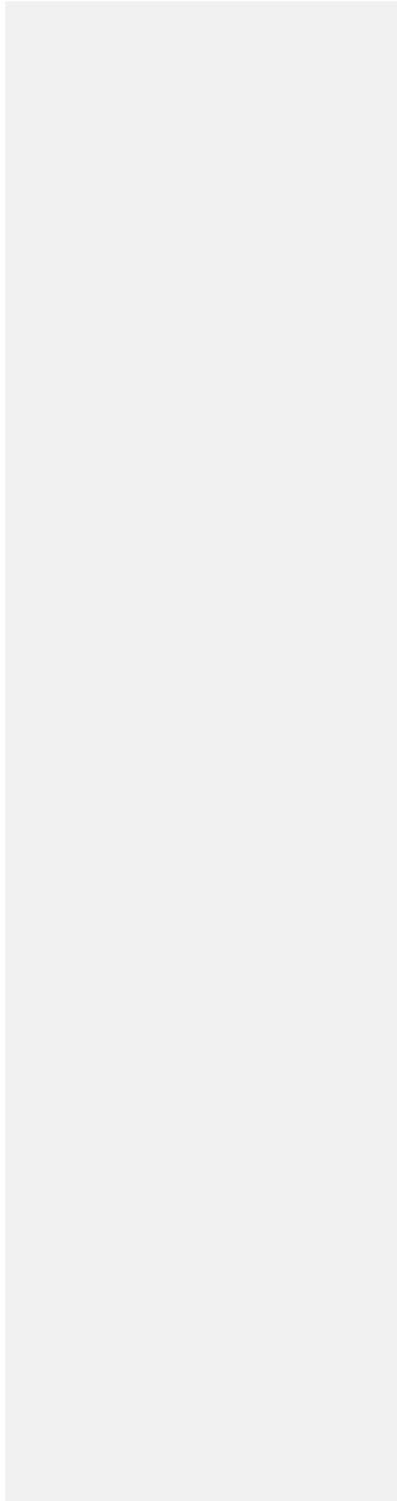
C. Air Use Considerations

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
23. Will the action result in any discharge into the air?	<u>X</u>	<u> </u>	<u>See Section III. F.</u>
24. If so, will the discharge affect ambient air quality parameters or produce a disagreeable odor?	<u> </u>	<u>X</u>	
25. Will the action generate additional noise which differs in character or level from present conditions?	<u>X</u>	<u> </u>	<u>See Section III. G.</u>
26. Will the action preclude future use of related air space?	<u> </u>	<u>X</u>	
27. Will the action generate any radiological, electrical, magnetic, or light influences?	<u> </u>	<u>X</u>	

D. Plants and Animals

28. Will the action cause the disturbance, reduction or loss of any rare, unique or valuable plant or animal?	<u> </u>	<u>X</u>	<u>See Section III. E. 6. b.</u>
29. Will the action result in the significant reduction or loss of any fish or wildlife habitats?	<u> </u>	<u>X</u>	<u>See Section III. E. 6. c.</u>

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
30. Will the action require a permit for the use of pesticides, herbicides or other biological, chemical or radiological control agents?	_____	<u>X</u>	
E. Socio-Economic			
31. Will the action result in a pre-emption or division of properties or impair their economic use?	<u>X</u>	_____	<u>See Section III. A. 4. b.</u>
32. Will the action cause relocation of activities, structures, or result in a change in the population density or distribution?	<u>X</u>	_____	<u>See Section III. A. 4. b.</u>
33. Will the action alter land values?	<u>X</u>	_____	<u>See Section III. C. 5.</u>
34. Will the action affect traffic flow and volume?	<u>X</u>	_____	<u>See Section I. C.</u>
35. Will the action affect the production, extra-action, harvest or potential use of a scarce or economically important resource?	_____	<u>X</u>	
36. Will the action require a license to construct a sawmill or other plant for the manufacture of forest products?	_____	<u>X</u>	



	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
37. Is the action in accord with federal, state, regional and local comprehensive or functional plans-including zoning?	_____	_____	
	<u> X </u>	_____	<u>See Section III. A. 1.</u>
38. Will the action affect the employment opportunities for persons in the area?	_____	_____	
	<u> X </u>	_____	<u>See Section III. C. 3.</u>
39. Will the action affect the ability of the area to attract new sources of tax revenue?	_____	_____	
	<u> X </u>	_____	<u>See Section III. C. 4.</u>
40. Will the action discourage present sources of tax revenue from remaining in the area, or affirmatively encourage them to relocate elsewhere?	_____	<u> X </u>	
41. Will the action affect the ability of the area to attract tourism?	_____	<u> X </u>	

F. Other Considerations

42. Could the action endanger the public health, safety or welfare?	_____	<u> X </u>	
43. Could the action be eliminated without deleterious affects to the public health, safety, welfare or the natural environment?	_____	<u> X </u>	

	<u>YES</u>	<u>NO</u>	<u>COMMENTS</u>
44. Will the action be of statewide significance?		<u>X</u>	
45. Are there any other plans or actions (federal, state, county or private) that, in conjunction with the subject action could result in a cumulative or synergistic impact on the public health, safety, welfare, or environment?	<u>X</u>	<u> </u>	<u>See Section III.</u>
46. Will the action require additional power generation or transmission capacity?	<u> </u>	<u>X</u>	
47. This agency will develop a complete environmental effects report on the proposed action.	<u>X</u>	<u> </u>	<u>See EA</u>

Purpose and Need

I. PURPOSE AND NEED

A. Project Location and Description

The Maryland State Highway Administration (SHA) and the Federal Highway Administration (FHWA) are conducting a Project Planning Study for improvements to MD 198 (Laurel-Fort Meade Road) from MD 295 to MD 32. The MD 198 planning project is located in northwestern Anne Arundel County, Maryland, almost midway between Baltimore City and Washington D.C. (Figure I-1).

MD 198 is on the State's Secondary System of Highways and is functionally classified as an Urban Other Principal Arterial under the Federal Functional Classification System. It is an east-west route that extends from Montgomery County to the west, through the City of Laurel in Prince George's County and terminates at MD 32/Fort Meade at the eastern end of the roadway limits. As part of the regional grid, it connects to major north-south arterials such as U.S. 29, I-95, U.S. 1 and MD 295. Within the study limits (Figure I-2), MD 198 has grade-separated interchanges with MD 295 and MD 32 and several at-grade intersections with local roadways. MD 198 serves as a primary gateway to Fort Meade from the south side of the installation. The existing typical sections for MD 198, within the project limits, primarily have one lane in each direction with shoulders. The posted speed limit from east of the MD 295 interchange area to Bald Eagle Drive is 50 mph, while the posted speed limit from Bald Eagle Drive to east of the MD 32 interchange is 40 mph.

The MD 198 project is consistent with the goals and objectives of State, regional and local planning documents. Improvements to MD 198 within the project study area are included in SHA's long range plan, the Highway Needs Inventory (HNI) and the Baltimore Metropolitan Planning Organization's *Plan It* 2035. The project is identified in the Anne Arundel County Executive's 2006 Transportation Priority Letter as a top priority and continues to be listed as a top priority in subsequent letters including the letter in 2014.

B. Purpose of the Project

The purpose of the project is to improve the existing capacity and traffic operations, and to increase vehicular and pedestrian safety along MD 198, while supporting existing and planned development in the area. MD 198 provides direct access to the Fort George G. Meade Military Reservation (Fort Meade) from MD 32, MD 295 and generally points south and west of the study area. Improving MD 198 would enhance access to Fort Meade and accommodate future transportation needs in the project area.

C. Need for the Project

The area around Fort Meade is one of the fastest growing areas of Anne Arundel County. Fort Meade and the National Security Agency (NSA), a tenant of the Fort, combined represent the largest employers in the State of Maryland. Fort Meade's workforce is comprised of more than 42,000 military, civilian, and contractor personnel. As a result of the 2005 Base Realignment and

Closure (BRAC) process, Fort Meade and the surrounding area are expected to experience considerable growth. By 2011 approximately 5,800 additional new on-base jobs were added to Fort Meade, and by 2020 an additional 20,000 or more new jobs are expected on Fort Meade. Additionally, 77 defense contractors have either established or expanded their presence in and around Fort Meade.

MD 198 provides a continuous connection between the City of Laurel and its suburbs with Fort Meade. The Laurel area has been a traditional community of Fort Meade and this relationship will continue as the Fort and its various tenant organizations increase in population and employment. MD 198 is also the route to convey Odenton area-generated travel demand to the Baltimore Washington Parkway (especially southbound) toward the Capital Beltway and the Washington Metropolitan area.

D. Travel Demand/Level of Service (LOS)

The Average Daily Traffic (ADT) volumes compiled along MD 198 between MD 295 and MD 32 are relatively even throughout, ranging from 21,600 to 24,000 ADT. Just west of the MD 295 interchange the existing ADT is considerably higher, at 42,850. At the other end of the study area the ADT drops to 14,800 at the MD 32 interchange (Table I-1).

The 2030 projected ADT was developed from the adopted Baltimore Metropolitan Council (BMC) Cooperative Forecast – Round 7C which includes BRAC traffic. During the Purpose and Need analysis, the forecast for the study area showed that the ADT is expected to increase approximately 26 percent west of MD 295, with future volumes ranging between 57,900 ADT just west of MD 295 to 33,450 ADT just west of the MD 32 interchange.

Table I-1: Average Daily Traffic

Location	Average Daily Traffic		
	Existing Volume (2006)	Future Volume (2030)	Percent Growth
MD 295 South of MD 198	93,600	122,500	24%
MD 295 North of MD 198	90,500	115,000	21%
MD 198 West of MD 295	42,850	57,900	26%
MD 198 East of MD 295	23,950	41,300	42%
MD 198 Over MD 32	14,800	33,450	56%
MD 32 North of MD 198	46,150	63,425	27%
MD 32 South of MD 198	58,500	76,600	24%

¹AM and PM peak hour volumes represent the highest volumes in the peak direction that occur on an average weekday (Monday through Friday). AM peak hour times are from 6 AM to 9 AM and PM peak hour times are from 4 PM to 7 PM.

Level of Service (LOS) is a scale measuring the freedom of mobility or severity of congestion experienced by drivers. The LOS scale ranges from A to F. LOS A represents free flow movements of traffic with little or no congestion. LOS F represents failure with stop-and-go conditions and long queues of traffic. LOS D occurs near a critical boundary where traffic flows become unstable. This level is generally considered acceptable during peak hours of traffic flow on streets and highways in urban and suburban areas. At LOS E, the roadway is operating near capacity with unpredictable daily delays. LOS is normally determined for the peak hours of the

typical weekday. These levels have been determined through traffic research and are related to measurable traffic characteristics such as delays, speeds, or traffic density.

The LOS as shown in the *Purpose and Need Statement* (2007) reflect both AM (6AM to 9AM) and PM (4 PM to 7 PM) peak hours for the entire study area have a LOS E. By 2030, the LOS will fail during both AM and PM peak hours (Table I-2). Three intersections within the study area limits operate at LOS E or F, under current traffic conditions, during both the AM and PM peak hours. These intersections include: MD 198/Tischer Entrance, MD 198/Ourisman Entrance, and MD 198/Welch’s Court. The intersection at MD 216 B (Old Portland Road) operates at LOS E in the AM peak; the Bald Eagle Drive intersection operates at LOS F in the PM peak.

Table I-2: Levels of Service (Including Vehicle/Capacity Ratios)

LIMITS	2006 LOS		2030 LOS	
	AM	PM	AM	PM
MD 198 Mainline (MD 295 to MD 32)	E	E	F	F
Market Place Corridor/ Russett	B	C	D	F
Tischer Entrance	F	F	F	F
Ourisman Entrance	F	F	F	F
Arundel Gateway	A	B	C	C
MD 216 B	E	D	F	F
Welch’s Court	E	F	F	F
Center Avenue	B	D	C	F
Bald Eagle Drive	A	F	C	F
Airfield Road	A	A	A	D
MD 32 Eastbound Ramps	A	A	B	D
MD 32 Westbound Ramps	B	A	F	F

In addition to jobs, the study area is expected to see substantial increases in population, housing, commercial activity and vehicular traffic as a result of the Arundel Gateway Development which is a large mixed land use parcel south of MD 198. The Anne Arundel County Council approved a zoning change for the Arundel Gateway parcel in 2010 based on the Anne Arundel County General Development Plan – 1997. Much of this land use will also serve the BRAC implementation in this area. The MD 198 Project Planning Study will address projected operational and safety deficiencies resulting from the expected growth. A traffic sensitivity analysis was completed for the corridor to reflect the changes to the traffic demand along the corridor.

Although additional locations have been added, the revised existing Average Daily Traffic (ADT) volumes which include traffic related to the Arundel Gateway parcel and BRAC along MD 198 between MD 295 and MD 32 are relatively even throughout, ranging from 21,600 to 24,000 ADT. At the west end of study area, the existing ADT is considerably higher, at 42,850 west of MD 295. At the other end of the study area the ADT drops to 7,900 east of the MD 32 interchange entrance to Fort Meade (Table I-3).

By 2030, the projected ADTs in the study area are expected to increase by over 100 percent within the majority of the MD 198 corridor, with future volumes ranging between 67,500 ADT west of MD 295 to 16,000 ADT east of MD 32.

Table I-3: Average Daily Traffic (ADT) Along MD 198

MD 198 Segment	Existing (2006)	Projected (2030)	Percent
West MD 295 Interchange	42,900	67,500	57%
East of MD 295 Interchange	24,000	57,500	140%
East of Arundel Gateway	22,700	52,400	131%
West MD 216B	22,700	48,400	113%
West Welch's Court	21,900	48,400	121%
West of Center Avenue	21,900	48,100	120%
West of Bald Eagle Drive	21,600	47,800	121%
West of Airfield Road	21,600	47,800	121%
West of MD 32 Interchange	21,800	47,900	121%
East of MD 32 Interchange	7,900	16,000	103%

A Level of Service (LOS) analysis was conducted for existing (2006) and forecasted (2030) No-Build conditions for the study area intersections and roadway segments based on the traffic sensitivity analysis.

The existing LOS analysis shows that the study area intersections have LOS that ranges from "A" to "F", with five intersections operating at failing LOS in either the AM or PM peak hours. In the 2030 design year, nine intersections are projected to operate at a failing LOS in either the AM or PM peak hours, and the mainline roadway segment of MD 198 between MD 295 and MD 32 is also projected to operate at a failing LOS during both peak periods (Table I-4).

Table I-4: Existing and No-Build Level of Service (LOS) and Volume-to-Capacity Ratio

Mainline	2006 AM	2006 PM	2030 AM	2030 PM
MD 198 - from MD 295 to MD 32	E (0.77)	E (0.87)	F (1.57)	F (1.68)
Intersections with MD 198	2006 AM	2006 PM	2030 AM	2030 PM
Corridor Market Place / Russett Green East	B (0.63)	C (0.78)	E (0.98)	E (1.00)
MD 295 Southbound Ramp	F	F	F	F
Tischer Entrance	F	F	F	F
Ourisman Entrance	F	F	F	F
Arundel Gateway Boulevard	A	B	F	F
MD 216B (Old Portland Road)	E	D	F	F
Welchs Court	E	F	F	F
Center Avenue (Woodlands Job Corps Ctr)	B	D	F	F
Bald Eagle Drive	A	F	F	F
Airfield Road	A (0.28)	A (0.49)	A (0.56)	C (0.76)
MD 32 Eastbound Ramps (Roundabout)	A	A	B	C
MD 32 Westbound Ramps (Roundabout)	B	A	F	F

Note: For unsignalized intersections, LOS is based on delay, and V/C ratio is N/A.

E. Safety

The Maryland State Highway Administration, Office of Traffic and Safety (SHA-OOTS) provided crash data for the 3.5-mile study area from 2003 to 2005. During that three-year period, a total of 155 crashes were reported resulting in one fatality and 87 injuries.

Table I-5 summarizes reported crashes within the MD 198 study area by crash type for the years 2003, 2004, and 2005. The crash information in Table I-5 indicates that the crash rate falls well below the statewide average rate for both MD 32 and MD 295 sections.

Table I-5: Crash Report Data

Severity	2003	2004	2005	Total	Study Rate	Statewide Average
MD 32: From Rogue Harbor Road to North of Mapes Road						
Fatal	-	-	-	-	0.0	0.6
Injury	-	-	-	-	0.0	35.7
Property Damage	2	4	5	11	10.3	48.5
Total Crashes	2	4	5	11	10.3	84.7
MD 198: From west of MD 295 to east of MD 32						
Fatal	1	0	0	1	N/A	N/A
Injury	18	15	26	59	N/A	N/A
Property Damage	38	16	41	95	N/A	N/A
Total Crashes	57	31	67	155	N/A	N/A
MD 295: From the Prince George's County Line to the Little Patuxent River						
Fatal	-	-	-	-	0.0	0.4
Injury	2	3	1	6	1.7	21.5
Property Damage	3	3	3	9	2.6	32.8
Total Crashes	5	6	4	15	4.3	54.7

Alternatives Considered

II. ALTERNATIVES CONSIDERED

A. Alternatives Presented to the Public at the Alternates Public Workshop

An Alternates Public Workshop was held on June 24, 2008 to present two mainline build alternatives, five interchange options, and the Traffic Systems Management (TSM) and No-Build Alternatives. Mapping for alternatives and options presented in this section is depicted in the Alternatives Retained for Detailed Study (ARDS) document (SHA 2009). The following alternatives were presented:

All of the mainline build alternatives include three basic elements:

- MD 198 mainline widening to include a grass median separating two lanes in either direction
- MD 198/MD 295 Interchange modifications
- Pedestrian and bicycle accommodations

Each of the mainline build alternatives includes the widening of MD 198 to improve safety, traffic capacity, and overall operations and is compatible with any of the five interchange options presented at the workshop.

Two mainline alternatives (Alternatives 3 and 4) and two interchange options (Options B and E) were dropped from further consideration. The description of the alternatives and options dropped and the rationale for dropping them are provided below.

Alternative 3 – Divided Roadway with Off-Road, Shared-Use Facility

Alternative 3 provided for two lanes in both directions (eastbound and westbound) divided by a 20-foot-wide grass median. On-road bicycle facilities were provided in both directions adjacent to the outside travel lane. A five-foot-wide grass buffer along the south-side curb separated the on-road bicycle lane from the shared-use pedestrian/bicycle path. The existing northern edge of the roadway was held and widening was proposed along the south side.

This alternative was dropped due to the lack of a sidewalk on the north side of the roadway. With proposed development along the corridor, the lack of a sidewalk would not promote pedestrian safety and connectivity.

Alternative 4: Divided Roadway with Off-Road, Shared-Use Facility and a Sidewalk

This alternative provided for two lanes in both directions (eastbound and westbound) divided by a grass median that varied throughout the corridor from 20 feet to 6 feet in width. On-road bicycle facilities were provided in both directions adjacent to the outside travel lane. A five-foot-wide grass buffer along the south-side curb separated the on-road bicycle lane from the shared-use pedestrian/bicycle path. This path extended from just east of the bridge over MD 295 to the ball-fields located adjacent to Bald Eagle Drive. East of Bald Eagle Drive, this path became a five-foot-wide sidewalk to the eastern limits of the project. There was also a five-foot-wide grass buffer along the north side of the curb that separated the on-road bicycle lane from the five-foot-wide sidewalk. This sidewalk extended from the western limits of the project area to the businesses located just east of the new location of Old Portland Road.

This alternative was dropped because it no longer provided improved traffic operations as a result of the increased traffic projections associated with redevelopment along the corridor.

Option B: Loop Ramp Option

This option maintained the existing configuration for the MD 198/MD 32 Interchange for the southern portion (the existing roundabout closest to Tipton Airport). However, the northern portion (the ramps closest to Fort Meade) was reconfigured. The existing roundabout was removed and replaced with a signalized intersection. All traffic from northbound MD 32 that was destined for Fort Meade would have utilized the ramp as it does today. All traffic from northbound MD 32 that was destined for westbound MD 198 would have utilized the proposed loop ramp. This configuration separated the traffic from Fort Meade from the traffic destined for Laurel.

This option was dropped because it no longer provided acceptable traffic operations due to an increase in the traffic projections.

Option E: Diamond Interchange with New Bridge

Option E created a signalized intersection along either side of MD 32 for drivers exiting and entering MD 32 from MD 198. However, the crossing of MD 32 was moved to a new bridge location to allow for a more direct connection. With this option, all traffic accessing MD 198 and Fort Meade would have used the same bridge. Airfield Road would need to be reconfigured to provide access to MD 198 under Option E.

This option was dropped because it did not separate traffic heading to Fort Meade from traffic on MD 32. It provided only one bridge that allowed all traffic on MD 198 direct access to Fort Meade. The option also required a significant amount of additional right-of-way for the relocation of Airfield Road. Although this option had the fewest wetland impacts, the relocation of Airfield Road and the interchange configuration would result in impacts on additional, high-quality wetlands.

B. Alternatives Retained for Detailed Study

1. Alternative 1: No-Build

No major improvements are proposed under the No-Build Alternative. Minor short-term improvements would occur as part of routine maintenance and safety improvements. This alternative does not address the Purpose and Need for the project. However, it serves as a baseline for comparing the impacts and benefits associated with the other alternatives.

2. Alternative 2: Transportation Systems Management (TSM)

This alternative involves the implementation of TSM strategies to optimize the existing transportation system by providing improvements with minimal capital cost (Figures II-1A and II-1B). The TSM strategies being considered for this corridor include:

- Improvements to the off-ramps from MD 295 to MD 198 within the Baltimore-Washington Parkway to alleviate confusion and increase merge distance
- Access management – combining several of the driveways and access points along MD 198 to provide for fewer turns off of the main road

- Left-turn lanes – including left-turn lanes for the combined access points to decrease the left-turn conflict with the through movement

3. Alternative 4 Modified: Divided Roadway with Off-Road, Shared-Use Facility and a Sidewalk

The proposed typical section for Alternative 4 Modified includes two lanes in either direction: an 11-foot-wide inside lane and a 12-foot-wide outside lane with a six-foot-wide bike lane (Figures II-2 and II-3). The two directions are separated by an 18-foot-wide median. The proposed typical section includes a 3-foot-wide buffer adjacent to the travel lane in both directions. A 5-foot-wide sidewalk and a 10-foot-wide shared-use pedestrian/bicycle path is provided on alternating and opposing sides of the roadway, outside of the 3-foot-wide grass buffer. A 2-foot-wide grass buffer is provided on the outside of the sidewalk and path. The sidewalk begins at Russett Green East and extends over MD 295 to Arundel Gateway Boulevard. The path extends from just east of the bridge over MD 295 to the ball fields located adjacent to Bald Eagle Drive. East of Bald Eagle Drive, the path becomes a 5-foot-wide sidewalk that extends to the eastern limits of the project. A 5-foot-wide grass buffer along the north side of the curb separates the on-road bicycle lane from the 5-foot-wide sidewalk that extends from the western limits of the project to the businesses just east of relocated Old Portland Road. Alternative 4 Modified will have a total width of 103 feet.

Within the Baltimore-Washington Parkway boundary, Alternative 4 Modified will add an additional lane to both southbound ramps as a closed roadway section, resurface the existing lanes, and add a signal at the intersection of MD 198 and the ramps. On MD 198, within the Baltimore-Washington Parkway and carried over the existing bridges, a shared use path will be added on the north side of MD 198 and a sidewalk will be added on the south side of MD 198. **This shared use path and sidewalk will be new construction on the approaches to the bridge, and is considered a permanent impact. The shared use path and sidewalk within the bridge parapets on the MD 198 bridge is considered a temporary impact since it is reusing the existing width on the bridge. The viewshed and the stone facing on the exterior of the bridge parapet exterior will not change.** The 5 foot wide sidewalk is 630 feet long (4,000 square feet); the ten foot wide shared use path is 691 feet long (6,035 square feet); the ramp widening is 2,400 feet long and varies in width from 1 – 12 feet (16,250 square feet). Total permanent impacts to the Baltimore-Washington Parkway are 0.94 acre. In addition, there will be 2.25 acres of landscape planting and the potential for up to 0.43 acre of treeline impact to the Baltimore-Washington Parkway property. The proposed typical section from the northbound on/off ramps for the Baltimore-Washington Parkway to the second access point of Arundel Gateway Boulevard also includes a 12-foot-wide eastbound auxiliary lane which will widen MD 198 in this area to 115 feet (Figure II-2).

Comment [h1]: Robert: mention the bridge and no impacts (viewshed, etc) to NPS – stone facing, etc won't be touched

Coordination between SHA and NPS regarding SHA's proposed improvements to MD 198 has resulted in the design of Alternative 4 Modified being revised to minimize impacts to NPS property. As a result, environmental site design facilities that treat storm water quality, were removed from NPS property. Drainage features necessary to provide a safe driving surface, and that are consistent with existing drainage features already in use within the Baltimore-Washington Parkway, remain as they protect the integrity of the roadway and park features susceptible to damage by storm water runoff. These improvements are not intended to treat roadway storm water runoff for water quality purposes and are included in the roadway improvements within the existing impact area calculations.

4. MD 198/MD 32 Interchange Options

i. Option A: Flyover Ramp

This option maintains the existing configuration of the MD 198/MD 32 Interchange. However, a flyover ramp is introduced that allows traffic from northbound MD 32 to access westbound MD 198 directly, completely separating this traffic from the roundabouts (Figures II-4, II-5A and II-5B). All other traffic through the interchange would operate as it does today.

ii. Option C: Diamond Interchange at Existing Bridge

This option reconfigures the existing MD 198/MD 32 Interchange from two roundabouts to two signalized intersections (Figures II-4, II-6A and II-6B).

iii. Option D: Two Bridge

This option maintains the existing MD 198/MD 32 Interchange configuration and adds a second crossing of MD 32 with access into Fort Meade (Figures II-4, II-7A and II-7B). Vehicles would exit northbound MD 32 as they do under existing conditions, utilizing the ramp to the roundabout and exiting the roundabout in the direction in which they wish to proceed. Vehicles coming from eastbound MD 198 would access Fort Meade from the second crossing of MD 32.

C. Travel Demand/Level of Service (LOS) for Build Alternatives

A Level of Service (LOS) analysis was conducted for future (year 2030) conditions for each of the Build alternatives. Alternative 2 (TSM) is projected to improve operations by consolidating access points along the corridor. However, the analysis results indicate that five intersections would still be projected to operate at failing LOS in the year 2030 under Alternative 2, and the mainline segment of MD 198 would also be projected to continue to operate at LOS F during both peak periods (Table II-1).

Table II-1: 2030 Build Alternative 2 (TSM) Level of Service (LOS) and Volume-to-Capacity Ratios (shown in parenthesis)		
Mainline	AM LOS	PM LOS
MD 198 - from MD 295 to MD 32	F (1.57)	F (1.68)
Intersections with MD 198	AM LOS	PM LOS
Corridor Market Place / Russett Green East	E (0.98)	E (1.00)
MD 295 Southbound Ramp	F (1.20)	F (1.16)
Arundel Gateway Boulevard / Tischer / Ourisman	F (1.63)	F (1.74)
MD 216B / Welchs Court / Center Avenue	F (1.42)	F (1.37)
Bald Eagle Drive	F (1.37)	F (1.37)
Airfield Road	A (0.56)	C (0.76)
MD 32 Eastbound Ramps (Roundabout)	B	C
MD 32 Westbound Ramps (Roundabout)	F	F

Alternative 4 Modified (Four-lane Divided Roadway) is projected to improve operations along the mainline segment of MD 198 between MD 295 and MD 32 to LOS D during both the AM and PM peak hours in the design year of 2030. Alternative 4 Modified is also projected to improve all intersections within the study area to LOS E or better (Table II-2).

Mainline		
MD 198 - from MD 295 to MD 32	D (0.70)	D (0.69)
Corridor Market Place / Russett Green East	E (0.98)	E (1.00)
MD 295 Southbound Ramp	D (0.83)	D (0.82)
Arundel Gateway Boulevard	E (0.95)	E (0.93)
Arundel Gateway – Second Access	D (0.90)	D (0.89)
MD 216B (Old Portland Road) / Welchs Court	D (0.81)	C (0.76)
Center Avenue / Liberty Valley Access	D (0.82)	D (0.81)
Bald Eagle Drive	C (0.75)	C (0.77)
Airfield Road	A (0.56)	C (0.76)

The MD 198 / MD 32 interchange improvement options were also analyzed to determine the LOS for each intersection under year 2030 conditions. The results indicate that all intersections are projected to operate at LOS E or better for each of the three retained interchange options (Table II-3).

Option A (Flyover)	AM LOS	PM LOS
MD 198 at MD 32 Eastbound Ramps (roundabout)	B	D
MD 198 at MD 32 Westbound Ramps (roundabout)	A	A
Option C (Diamond Interchange)	AM LOS	PM LOS
MD 198 at MD 32 Eastbound Ramps (signal)	E (0.96)	B (0.70)
MD 198 at MD 32 Westbound Ramps (signal)	E (0.97)	D (0.90)
Option D (Two Bridge)	AM LOS	PM LOS
MD 198 at MD 32 Eastbound Ramps (roundabout)	C	B
MD 198 Westbound at Mapes Road (signal)	D (.088)	D (0.86)

Note: For unsignalized intersections, LOS is based on delay, and V/C ratio is N/A

MD 198 Mainline Alternative 2: Transportation System Management (TSM)



LEGEND

- | | |
|-------------------------------------|--|
| — Proposed Roadway | —(Bridge Structure |
| — Proposed Median | - - - Potential Displacement |
| — Proposed Sidewalk | - - - 2009 Delinaalid Water & of the US |
| — Removal of Existing Pavement | - - - Schem8 |
| — Existing Right of Way | - - - 2009 Delinaalid Wetlands |
| - - - Property Unclear | - - - Forest |
| - - - Existing Lane configuration | - - - Historic Boundary |
| - - - Proposed Traffic Flow | - - - 100 Year Floodplain |
| - - - Proposed Limit of Disturbance | - - - Proposed SWM/J Environmental Site Design |

MARYLAND SHA State Highway
 DEPARTMENT OF TRANSPORTATION
 STATE HIGHWAY ADMINISTRATION
 PROJECT MANAGEMENT DIVISION
 SCALE 1"=400'

BACKGROUND MAPPING SOURCE
 MDSHA
 (PLANNING)
 1--
 FIGURE 11-1A

MD 198 Mainline Alternative 2: Transportation System Management (TSM)

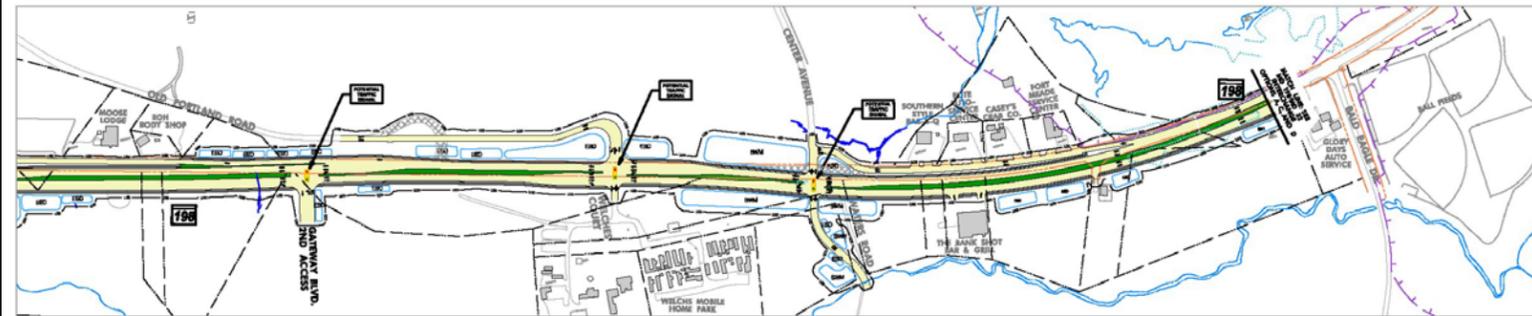
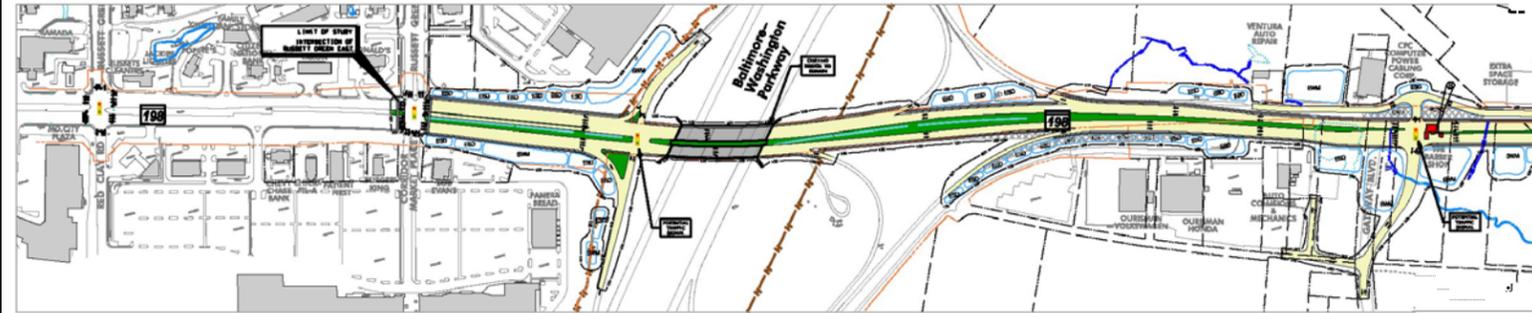


LEGEND

Proposed Roadway	Bridge Structure
Proposed Median	Potential Displacement
Proposed Sidewalk	2009 DelinaalidWater&of the US
Removal of Existing Pavement	Schem8
Existing Right of Way	2009 DelinaalidWetlands
Property Line&	Forest
Existing Lane configuration	Historic Boundary
Proposed Traffic Flow	100 Year Floodplain
Proposed Limit of Disturbance	Proposed SWM/E
	Environmental Site Design

	DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION PROJECT MANAGEMENT DIVISION	BACKGROUND MAPPING SOURCE: MDSHA (PLAN#21154)
	SCALE 1"=400' FIGURE 11-18	

**MD 198 Mainline Alternative 4 Modified:
Divided Roadway with Off-Road Shared-Use and a Sidewalk**



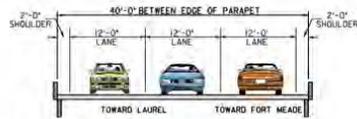
LEGEND

— PdP1811 Roadway	--- Bridge Structure
— PdP1811 Median	--- Potentill Overplacement
— PdP1811 Sidewalk	— 2009 Calibrated Wetland US
--- Removal of Existing Right of Way	— Shiloma
--- Existing Right of Way	— 2009 Delineated Wetland
--- Property Line	— Forest
--- Existing Lane Configuration	--- Half-Divide Boundary
--- Proposed Traffic Flow	--- 100-Year Floodplain
--- Proposed SWME Environmental Site Design	

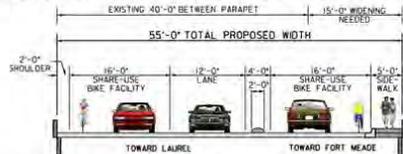


	MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION PROJECT MANAGEMENT DIVISION	BACKGROUND MAPPING SOURCE MDSHA (11/11/10/2010)
	SCALE 1" = 400'	FIGURE 11-3

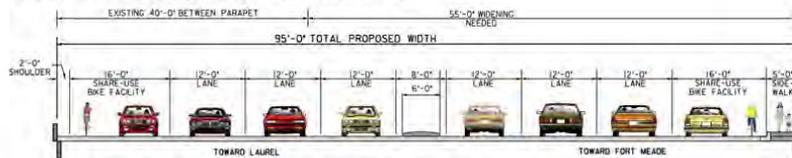
EXISTING MD 198: BRIDGE OVER MD 32



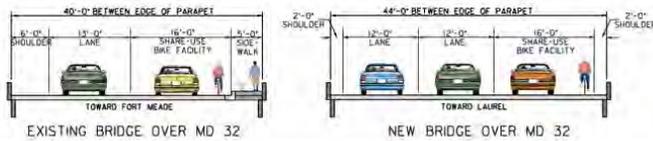
PROPOSED MD 198: BRIDGE OVER MD 32 FOR INTERCHANGE OPTIONS A



PROPOSED MD 198: BRIDGE OVER MD 32 FOR INTERCHANGE OPTION C



PROPOSED MD 198: BRIDGE OVER MD 32 FOR INTERCHANGE OPTION D

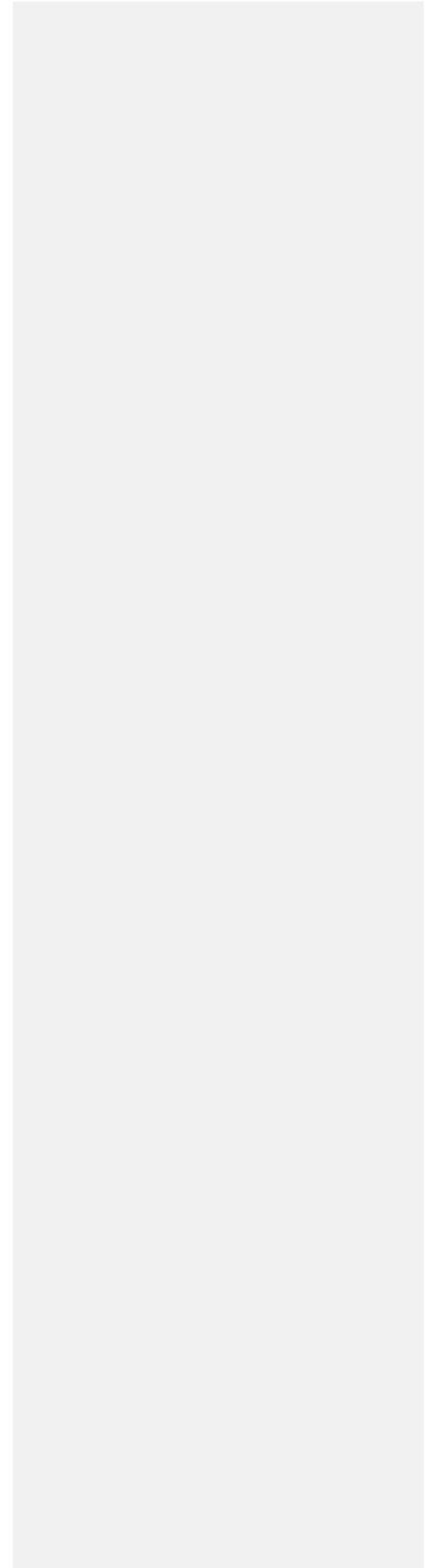


**MD 198 PLANNING STUDY
TYPICAL SECTIONS
INTERCHANGE OPTIONS**

MD SHA MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
SCALE = NOT TO SCALE

IN CHARGE: MAPPING SOURCE
MD SHA

Existing Environment and Environmental Consequences



III. EXISTING ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the existing conditions in the study area and the potential impacts of the proposed improvements to MD 198. The categories presented affect relevant environmental disciplines identified in the Federal Highway Administration (FHWA) 23 Code of Federal Regulations (CFR) Part 771, “Environmental Impact and Related Procedures” and all other appropriate federal, state, and local laws.

A. Land Use

1. Existing and Future Land Use

The study area is primarily composed of forest and institutional lands, with smaller areas classified as commercial, industrial, residential and parkway (Figure III-1). The large amount of institutional land use is a result of the project’s proximity to Fort Meade and the District of Columbia Children’s Center on the north side of MD 198, between MD 295 and MD 32. Other institutional uses include the Patuxent Research Refuge and the Tipton Airport along the south side of MD 198. Commercial and industrial facilities are sparsely scattered along the MD 198 corridor. The majority of these facilities are concentrated along the western edge of the study area, east of MD 295. A single residential community, Welch’s Mobile Home Park, is located within the study area, with direct access to MD 198. A few single-family homes are scattered along the study area but are not part of a community. MD 295, the Baltimore-Washington Parkway, bisects the project area near its western limit. This property is owned and administered by the NPS as a scenic highway connecting Baltimore and Washington DC and as the grand entrance into the nation’s capital, however there are no active recreational uses of the parkway within the MD 198 study area.

Comment [h2]: Robert: NPS interests are: ‘Grand entrance’ into DC, connecting Baltimore with DC and is a ‘scenic’ highway

Three master plans govern land use in the study area: the *Anne Arundel County General Development Plan (GDP)* (2009), the *Jessup/Maryland City Small Area Plan* (2004), and the *Odenton Small Area Plan* (2003). The project falls mostly within the Jessup/Maryland City Small Area Plan. Both the GDP and the Jessup/Maryland City Small Area Plan recommend capacity improvements along MD 198 through the study area. **Figure III-2** displays the projected land use for the study area.

MD 198 provides a continuous connection between the City of Laurel and its suburbs with Fort Meade. The Laurel area has been a traditional community of Fort Meade, and this relationship will continue as the Fort and its various tenant organizations increase in population and employment. Based on SHA’s estimate, the Base Realignment and Closure (BRAC) process is expected to generate 2,000 additional daily trips through the study area along MD 198 and approximately 34,000 average daily trips (ADT) by 2015: a 77.3 percent increase over the existing 22,000 ADT. Also, traffic generated within the Odenton area uses MD 198 to reach the Baltimore-Washington Parkway (especially the southbound lanes), along which it travels toward the Capital Beltway and the Washington Metropolitan Area.

The study area and the surrounding region expect considerable growth. Projected regional growth trends indicate an increased need for housing, services, and businesses. Arundel Gateway is a mixed-use village planned for construction on the south side of MD 198, just east of the MD 198/MD 295 Interchange. The 300-acre mixed-use property, as proposed in the bond bill,

MD 198 – FROM MD 295 TO MD 32

would include approximately 150,000 square feet retail space, 300,000 square feet office space, 150 hotel rooms and 1,650 apartment/condominium space. The traffic impact studies completed in March 2011 show the following breakdown for the proposed development: a) Arundel Gateway – 150,000 square foot shopping center, 100,000 square foot office space, 1,050 townhouse/condominiums and 360 apartments, and b) Liberty Valley (originally part of Arundel Gateway, but now a separate development) – 440 apartments. Specifics of the development will be finalized as the land development approval process is completed.

2. Effects on Land Use

The No-Build Alternative requires no land-use changes from displacements or right-of-way (ROW) acquisitions. Alternative 2 would result in the transfer of 10.8 acres from commercial land use to transportation use through ROW acquisition. Future land-use projections are shown in Figure III-2.

Alternative 4 Modified and the interchange options each require conversion of residential and commercial land to transportation uses, whether through displacement or ROW acquisition. The minimum amount of land use conversion would be 48.2 acres with the combination of Alternative 4 Modified and Interchange Option C. The maximum amount of land use conversion would be 49.3 acres with the combination of Alternative 4 Modified and Interchange Option A. The mainline alternative and the interchange options are consistent with local land-use plans. The expansion of MD 198 and the addition of accessible, user-friendly pedestrian and bicycle facilities should attract residents and businesses to locations in and around the study area.

Alternative 4 Modified improvements in capacity, pedestrian and bicycle facilities at the MD 198/MD 295 interchange would convert 0.94 acre of NPS property to transportation use.

B. Social Characteristics

A socio-economic land use inventory was conducted as part of the MD 198 study and is summarized in the following narrative. For additional details, refer to the *MD 198 Community Effects Assessment* (SHA, 2010).

The inventory involved the identification of communities, community facilities, and commercial and industrial facilities within the study area. In addition, data regarding population, ethnicity, economics, and other demographics, which were available through the U.S. Census Bureau's Census 2000, were compiled and evaluated. Data was collected at the census tract block group level. The census tract block groups that encompass the study area are depicted in Figure III-3.

1. Population and Housing

Table III-1 shows the population statistics for the State of Maryland, Anne Arundel County, and the study area. The population for Maryland is expected to increase by 1,387,764 or approximately 26 percent while Anne Arundel County's population is expected to increase by 83,144 or approximately 17 percent. Approximately four percent of the study area is over the age of 65, less than half that of the State and County. The percent of persons within the study area with one or more disabilities is 12, the same as the county but lower than the State. The median household income for the study area is \$66,962, which is more than Maryland (\$52,686) and

Anne Arundel County (\$61,768). Approximately four percent of the study area is over the age of 65, less than half that of the State and County. The population for Maryland is expected to increase by approximately 26 percent while Anne Arundel County’s population is expected to increase by approximately 17 percent.

Table III-2 gives the housing statistics for Maryland and Anne Arundel County. Information on the housing characteristics for the study area has not been included due to changes in the census tract boundaries between 1990 and 2000. The number of households in Anne Arundel County has increased by 19 percent between 1990 and 2000; during the same period, the State experienced an increase of 13 percent.

Table III-1: Population Characteristics

Characteristic		Maryland	Anne Arundel County	Study Area
Total Population		5,296,486	510,778	N/A ¹
Projected Population by 2030		6,684,250	572,800	N/A ¹
Percent of Population 65 Years or Older*		11.3	11.1	4.4
Percent of Population in Poverty*		8.5	5.1	8.4
Median Household Income ²		\$70,005	\$83,398	\$66,962*
Percent of Population with One or More Disabilities*		28	12	12
Racial Distribution (%)	White	64	75.7	51.1*
	Black	28	14.6	37.7*
	Alaska Native/ American Indian	<1	0.2	0.4*
	Asian/ Pacific Islander	4	3	4.4*
	Hispanic ³	2	4.2	3.6*
	Minority ⁴	2	1.4	48.9*

¹Changes in the census tract boundaries between 1990 and 2000 resulted in the inability to estimate the overall population of the study area.

²A household, as defined by the U.S. Census, is a place (structure) where one or more persons reside on a regular basis. A family is defined as two or more persons related by birth, marriage, or legal adoption who occupy a place on a regular basis.

³Hispanic is an origin, not a racial designation. Origin can be viewed as the heritage, nationality group, lineage, or country of birth of the person or the person's parents or ancestors before their arrival in the United States. People who identify their origin as Spanish, Hispanic, or Latino may be of any race.

⁴Percent Minority includes populations of two or more races and populations of one race alone other than the races listed above in addition to Black, Alaska Native/American Indian, Asian/Pacific Islander, and Hispanic populations.

*Figures from Census 2000 only. Information was not available in the 2006-2008 American Community Survey 3-year Estimates data

Table III-2: Housing Characteristics

	Households in 1990	Households in 2000	Percent Change from 1990 to 2000	Housing Units in 1990	Housing Units in 2000	Percent change from 1990 to 2000
<i>Maryland</i>	1,748,991	1,980,859	13.3%	1,891,917	2,145,283	13.4%
<i>Anne Arundel County</i>	149,114	178,670	19.8%	157,194	186,937	18.9%

2. Environmental Justice

Based on a review of census data and coordination with churches and schools in the vicinity of the study area, no Environmental Justice (EJ) populations were identified. A field review conducted on February 15, 2007, also did not identify minority or low-income populations within the MD 198 study area.

a. Methodology

The SHA obtained baseline demographic information at the block group level from Census 2000 and used it to identify potential locations of minority and low-income populations. Project team members compared that block group data to the overall study area minority and poverty level totals to identify concentrations of minority and low-income populations and consulted local planning officials to identify other potential EJ populations within the study area.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, defines minority persons as follows:

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

A person whose median household income is at or below the Department of Health and Human Services (DHHS) poverty guidelines is defined as “low income.” The DHHS guidelines are derived from the poverty thresholds updated each year by the U.S. Census Bureau. DHHS 2008 poverty guidelines are \$10,400 for the first person in a household and \$3,600 for each additional person, up to \$21,200 for a family of four.

b. Findings

According to the criteria above, Census 2000 indicates that minority populations make up 48.9 percent of the study area. Approximately 51 percent are White; 37.7 percent are Black; 3.6 percent are Hispanic; 4.4 percent are Asian, Hawaiian, or Pacific Islander; and 0.4 percent is American Indian or Alaska Native (Table III-3).

The Anne Arundel County Office of Planning and Zoning and the Maryland Department of Planning did not have any information about low-income or minority communities within the study area. The D.C. Children’s Center, a federal facility providing training and residential services for juveniles in the court system, is 600 feet north of MD 198.

SHA guidelines (Appendix D) define a minority block group as a ‘block group with a meaningfully greater percentage of minorities than the study area as a whole.’ SHA’s analysis of the Census 2000 data determined that no minority block groups exist in the study area.

MD 198 – FROM MD 295 TO MD 32

SHA uses the following criterion to determine low-income block groups: a block in which the percentage of families below the poverty level exceeds the percentage of families below the poverty level in the greater geographic area. In addition to its review of census information, SHA conducted a field review in attempt to identify minority and/or low-income communities within or adjacent to the project area. The field review identified no minority or low-income communities within the project corridor. The study area has relatively the same percentage of population considered below the poverty level as the State, but is higher than the County.

On October 12, 2007, SHA mailed 7,306 newsletters (Appendix B) to notify all potentially affected populations (including EJ populations) about the project. To date, no EJ communities have contacted SHA. Based on the population characteristics within the study area low percentage of non-English speaking population), the newsletter was not translated into any other languages. Project team members met with the owners of Welch’s Mobile Home Park on December 8, 2008 to discuss the project. SHA provided a description of the MD 198 Project Planning Study, alternatives, and project schedule and a definition of Environmental Justice populations. SHA interviewed the Welch’s Mobile Home Park owners to determine EJ eligibility. The answers to the interview questions obtained by SHA at this meeting indicated that Welch’s Mobile Home Park could not be confirmed as an EJ community.

Table III-3: Racial Distribution, Median Household Income, and Population Below Poverty Status for Anne Arundel County and the Study Area

Census Block Group	White (%)	Black (%)	Alaska Native/American Indian (%)	Asian/Pacific Islander (%)	Hispanic (%) ¹	Minority (%) ²	Median Household Income ³ (1999)	Population Below Poverty (%) (1999)
<i>Anne Arundel County</i>	79.8	13.4	0.3	2.4	2.6	20.3	\$61,768	5.1
<i>Study Area³</i>	51.1	37.7	0.4	4.4	3.6	48.9	\$66,962	8.4
7405 / 1	48.7	36.8	0.2	8.0	3.3	51.3	\$77,620	5.7
7405 / 4	62.1	24.4	0.3	5.4	5.5	38.0	\$59,412	3.6
7406.03 / 1	65.7	22.9	0	2.9	2.9	34.4	N/A	N/A
7406.03 / 3	50.2	36.7	0.9	5.9	3.2	49.9	\$35,278	32.8
7411 / 1	29.0	67.7	0.4	0	2.9	71.0	\$162,500	0

Source: U.S. Census Bureau, Census 2000

¹Hispanic is an origin, not a racial designation. Origin can be viewed as the heritage, nationality group, lineage, or country of birth of the person or the person's parents or ancestors before their arrival in the United States. People who identify their origin as Spanish, Hispanic, or Latino may be of any race.

²Percent Minority includes populations of two or more races and populations of one race alone other than the races listed above in addition to Black, Alaska Native/American Indian, Asian/Pacific Islander, and Hispanic populations.

³A household, as defined by the U.S. Census, is a place (structure) where one or more persons reside on a regular basis. A family is defined as two or more persons related by birth, marriage, or legal adoption that occupy a place on a regular basis.

⁴The figures shown for the study area were determined by calculating the average value of the census tract block groups in the study area.

*Information was not available for the representative block groups in the 2006-2008 American Community Survey 3-year Estimates data

c. Effects on Minority and Low-Income Populations

Analysis of census data and field reviews and coordination with churches and schools in the vicinity of the study area have identified no known concentrations of minority or low-income (Environmental Justice/EJ) populations.

No direct impacts are expected for the residents of Welch's Mobile Home Park community, but they would benefit from the project's improved access, safety, and roadway capacity. The shared-use pedestrian/bicycle path, bicycle lanes, and sidewalk proposed under the build alternatives would provide Welch's residents with safe alternatives to vehicular travel. SHA will continue to coordinate with the owner and residents of the mobile home park community to update them on project status and offer the opportunity for comments and questions about the project.

Title VI Statement

It is the policy of the SHA to ensure compliance with the provisions of Title VI of the Civil Rights Act of 1964 and related civil rights laws and regulations which prohibit discrimination on the grounds of race, color, sex, national origin, age, religion, or physical or mental handicap in all SHA programs and projects funded in whole or in part by the FHWA. The SHA will not discriminate in highway planning, highway design, highway construction, right of way acquisitions, or the provision of relocation advisory assistance. This policy has been incorporated in all levels of the highway planning processes to ensure that proper consideration may be given to the social, economic, and environmental effects of all highway projects. Alleged discriminatory actions should be addressed for investigation to the Equal Opportunity Section of the SHA, to the attention of Ms. Jennifer Jenkins, Director, Office of Equal Opportunity, 707 North Calvert Street, Baltimore, Maryland 21202.

2. Public Participation

Outreach strategies for the MD 198 Project Planning Study are ongoing. SHA has documented the public's concerns about current congestion along MD 198, the impacts of BRAC, and the expansion of MD 198. These and other project-related concerns were expressed at the November 7, 2007, Informational Open House and the June 24, 2008, Alternates Public Workshop. A list of the stakeholders and summaries of the meetings are included in Section IV and Appendix B.

The Informational Open House was held on November 7, 2007. The open house provided the opportunity for residents, business owners, and community members to review and comment on the conceptual designs. Approximately 80 people attended the meeting and four comment cards were returned during or after the meeting. Many citizens are concerned about the BRAC improvement and want the MD 198 improvement to take place as soon as possible. Several citizens suggested that clearer signage on I-295, MD 32, MD 198, and other major roadways is needed for trucks and visitors traveling to Fort Meade. Many citizens and business owners want to be better informed and involved about project status and meetings. The comments received from the meeting are included in Appendix B.

The Alternates Public Workshop was held on June 24, 2008. The workshop provided the opportunity for residents, business owners, and community members to review and comment on the mainline alternatives and MD 198/MD 32 Interchange options. Many citizens commented on the project's ability to maintain pedestrian and bicycle access and expressed concerns about the MD 198/MD 32 Interchange roundabouts and the environmental impacts associated with the widening of MD 198. The comments received from the meeting are included in Appendix B.

3. Neighborhoods/Communities

a. Existing Conditions

The following communities/developments were identified during a study area field review: Summitt Russett, Russett Green, and Welch's Mobile Home Park (Figure III-4). One residential community, Welch's Mobile Home Park, is located within the study area. The communities of Summitt Russett and Russett Green are located just outside the study area's western limits and consist of condominiums, townhouses, and single- and multi-family homes, which are representative of other residential communities surrounding the project study area. Welch's Mobile Home Park consists of 25 units, with portions of the property leased for use as an upholstery store, a mechanic shop and a storage facility.

b. Effects

Impacts on communities and neighborhoods typically fall into three categories: community cohesion/isolation/accessibility; community social values/quality of life; and effects on community visual and aesthetic resources.

Community Cohesion/Isolation/Accessibility

Community cohesion refers to a personal recognition of belonging to a neighborhood or community through social interaction. Isolation of a community is similar to a reduction in community cohesion. It can result from residential structure displacements or from a physical barrier dividing or isolating a neighborhood or community.

The No-Build Alternative would result in no residential displacements, ROW acquisitions, or property impacts. This alternative would have no effect on community and neighborhood cohesion or isolation.

Alternative 2 does not require any displacements, but does result in the acquisition of 10.8 acres of ROW from seven commercial properties. The acquisitions would be minor linear sliver takes, which would not affect accessibility to the businesses or community cohesion.

Alternative 4 Modified would require one commercial displacement, 36.5 acres of ROW acquisitions and 37 property impacts (Table III-4). Impacts associated with this alternative would neither displace residents within the study area nor affect community and neighborhood cohesion or isolation. Alternative 4 Modified proposes integrating a traffic signal at the entrance to Welch's Mobile Home Park and Arundel Gateway, which would allow the residents safe access to and from the community, as there are no signals there today. The proposed relief in traffic congestion would improve accessibility to study area residences and businesses. Although there would be one commercial displacement, the 198 Barber Shop located at the corner of Gateway Boulevard and MD 198, the remaining businesses are expected to benefit from the improved accessibility to and within the study area. Upgrades to MD 198 have been designed to add an American Disabilities Act (ADA) compliant shared-use pedestrian/bicycle path on the south side of MD 198, a sidewalk along the northern edge of the roadway, and bicycle lanes in either direction, thereby improving access for both pedestrians and bicyclists. The design includes widening the existing MD 198 roadway to add an additional lane in each direction, which would provide additional capacity to handle projected growth.

Interchange Options A, C, and D result in commercial ROW acquisition and property impacts, but no displacements. These impacts are similar in nature to those of Alternative 4 Modified and would not cause community or neighborhood isolation or loss of cohesion. The proposed upgrades to the MD 198/MD 32 Interchange would create a more accessible, user- friendly interchange with the additional capacity to handle projected growth and growth due to BRAC. The interchange designs offer improved traffic movement, in some cases separating Fort Meade traffic to reduce traveler confusion and unintentional arrival at the Fort Meade gate.

Table III-4: Displacements/Right-of-Way Impacts

	Alt. 1 (No- Build)	Alt. 2 (TSM)	Alt. 4 Modified	Option A	Option C	Option D
Number of Potential Displacements						
Residential	0	0	0	0	0	0
Commercial	0	0	1	0	0	0
Total	0	0	1	0	0	0
ROW Required (acres)						
Residential	0.0	0.0	0.1	0.0	0.0	0.0
Commercial	0.0	10.8	36.4	12.8	11.7	11.9
Total	0.0	10.8	36.5	12.8	11.7	11.9
Number of Properties Impacted						
Residential	0	0	1	0	0	0
Commercial	0	7	35	2	2	2
Fort Meade Property	0	0	1	1	1	1
Tipton Airport Authority	0	0	0	1	1	1
Federal Property	0	0	0	1	1	1
U.S. Fish & Wildlife Services	0	0	0	1	1	1
Total	0	7	37	6	6	6

Social Values/Quality of Life

Quality of life is a combination of community cohesion, accessibility, health and safety concerns, and social changes. Health and safety concerns that can affect quality-of-life include changes in the response time of police, fire, and other emergency services providers. Social change that can affect quality-of-life includes the displacement of neighbors, community facilities, and businesses.

The impacts associated with Alternative 2, Alternative 4 Modified, and the interchange options would have a positive effect on the quality-of-life in and around the study area through reduced roadway congestion, increased traffic safety, and improved pedestrian and bicyclist access. Alternative 4 Modified requires no residential displacements and only results in one commercial displacement, a barber shop located along MD 198, adjacent to the Arundel Gateway Development. The owner of the barber shop plans to relocate the business to the proposed Anne Arundel Gateway Center when it is completed, regardless of whether or not Alternative 4

MD 198 – FROM MD 295 TO MD 32

Modified is constructed. Because plans exist to relocate the barber shop and additional barber shops are located in Maryland City, impacts to the surrounding community from displacement of this business would be minimal (Figure I-2). Since no residential displacements are required, social change associated with the build alternatives would be minor. The interchange options require no commercial or residential displacements.

The proposed upgrades to MD 198 have been designed to add an ADA-compliant shared-use pedestrian/bicycle path on the south side, a sidewalk along the northern edge of the roadway, and an on-road bicycle lane in both directions, to improve access for pedestrians and bicyclists. The additional lane capacity on MD 198 provided by Alternative 4 Modified would reduce current traffic congestion and prevent an increase in congestion as the roadway absorbs the projected study area growth and the additional growth expected as a result of BRAC. The interchange design offers improved traffic movement, in some cases separating Fort Meade traffic to reduce traveler confusion and unintentional arrival at the Fort Meade gate.

4. Effects on Aesthetics and Visual Resources

Although there are some minor improvements associated with Alternative 2, the changes are so minor relative to the existing visual landscape that it is not considered to have any aesthetic or visual impacts. The improvements proposed in Alternative 2 are associated with the existing transportation system, which would not impact the viewshed or physical nature of the MD 198 corridor.

Alternative 4 Modified would alter the visual landscape by widening MD 198 to a four-lane highway with on-road bicycle lanes, a shared-use pedestrian/bicycle path, and a sidewalk. The proposed typical section for Alternative 4 Modified includes two lanes in either direction with the inside lane being 11 feet wide and the outside lane being 12-foot with a six-foot-wide bike lane. The two directions are separated by an 18-foot-wide median. The proposed typical section includes a three-foot-wide buffer adjacent to the travel lane in both directions with a five-foot-wide sidewalk with a two-foot grass buffer outside the sidewalk on the westbound side and an ten-foot-wide shared-use pedestrian/bicycle path with a two-foot grass buffer outside the path on the eastbound side. Alternative 4 Modified will have a total width of 103 feet, an increase of approximately 59 to 79 feet over the dimensions of the existing roadway. An auxiliary lane begins east of the northbound on/off ramps for the Baltimore-Washington Parkway to the second access point of Arundel Gateways.

The improvements within the NPS property include adding an additional lane to the Baltimore-Washington Parkway ramps, resurfacing the roadway and adding a signal, and along MD 198 within the Park property the improvements include adding a shared use path and sidewalk. Although the ramp improvements occur in an area of maintained lawn, the potential exists for up to a 0.43 acre of tree impacts along the adjacent treeline. Any tree loss would be replaced on a 1:1 ratio, with species and locations approved by NPS, with SHA maintenance for three years. One part of the treeline that could be impacted is in an area of tree buffer previously thought to be owned by retail corporations, but was recently identified as owned by NPS.

Interchange Option A includes a flyover ramp to allow traffic from northbound MD 32 to merge onto westbound MD 198, completely separating that traffic from the roundabouts. Under Interchange Option D, a second bridge crossing MD 32 is added for vehicles accessing Fort Meade from eastbound MD 198. Under each of these options, the new structures (the flyover

Comment [h3]: Robert: when it comes to the 0.43 acres, always go with the 'worst case' scenario. If we don't we would have to go back during design and re-do compliance. So don't go conservative... but mention we are hoping to keep impacts well below that number.

Karen – True. We are using the 'worst case' number to be 'conservative' in our estimate. (Different faces of the same coin.)

MD 198 – FROM MD 295 TO MD 32

ramp and the bridge) would be approximately 32 feet taller than dominant features in the landscape.

Interchange Option C reconfigures the existing MD 198/MD 32 Interchange from two roundabouts to two signalized intersections. This option's visual impact under existing conditions is minimal, and it has the fewest visual impacts of the four proposed options.

Roadway widening along MD 198 is not proposed in the vicinity of the Summitt Russett and Russett Green residential communities; therefore, there would be no visual impacts to these communities. Although widening is planned for MD 198 adjacent to Welch's Mobile Home Park, the existing forested buffer would be maintained and there would be no visual impacts to this community.

Roadway widening along MD 198 and the proposed interchange options would have minor visual impacts on the businesses located within the study area. Although newer, larger visual elements associated with the proposed alternatives and interchange options would be introduced into the landscape, the modified views would remain consistent with the existing highway corridor. In addition to the improved accessibility and safety features, the new pedestrian and bicycle facilities provide a more aesthetically pleasing quality to the MD 198 corridor.

Aesthetic treatments would be considered once an alternative and interchange option are selected and detailed design work begins. If SHA selects an alternative that includes a new bridge or flyover ramp, aesthetic treatments can be incorporated into the final design of the structures to make them more visually pleasing to the adjacent homes, businesses, and roadway commuters - and more consistent with the overall study area landscape.

5. Community Facilities and Services

Community facilities and services were identified and inventoried by reviewing census data, geographical information systems (GIS) mapping, ADC maps, discussions with local planners, and field reconnaissance. There were no public schools, places of worship, libraries, health care facilities, or emergency service provider facilities identified within the study area.

a. Parks and Recreational Areas

No community recreation centers lie within the study area. The closest recreation facility is Emancipation Community Park, in Laurel, Maryland, west of the study area and east of the I-95/MD-198 interchange. The study area contains portions of the Patuxent Research Refuge and the Baltimore-Washington Parkway which will be impacted by the proposed improvements. Proposed impacts to the refuge and parkway are discussed below.

Patuxent Research Refuge

The Patuxent Research Refuge is located within the southern section of the study area, south of MD 198, but outside the project area. The Refuge owns and manages wildlife refuge lands and four ball fields located at the southeast corner of the MD 198/Bald Eagle Drive intersection. The Patuxent Research Refuge is one of more than 540 Refuge areas in the National Wildlife Refuge System, administered by the U.S. Fish and Wildlife Service (USFWS). The Refuge area totals 12,641 acres and consists of three tracts. Portions of the North Tract are located in the study area off MD 198, 1.4 miles east of the Baltimore-Washington Parkway. The North Tract includes

MD 198 – FROM MD 295 TO MD 32

8,100 acres of a former military training area transferred from the Department of Defense by Congressional mandate in 1991.

The Refuge permits activities compatible with research and wildlife management objectives, including hiking, bicycling, horseback riding, hunting, fishing, wildlife observation, and environmental education. The ball fields can be utilized by the public and by governmental agencies.

Baltimore-Washington Parkway

The Baltimore-Washington Parkway (Parkway) is a 29-mile scenic artery within the park and parkway system of the nation's capital that extends from Baltimore to the eastern boundary of the District of Columbia. The National Park Service manages a 19-mile section of the Parkway between Fort Meade (MD 32) and the formal entrance to the District of Columbia. There are no active recreational activities within the Parkway, but there are several places of interest along the Parkway that the public can visit. The Parkway is encompassed by a historic boundary and is listed as a historic district on the National Register of Historic Places (NHRP).

Effects to Parks and Recreational Facilities

Both the Patuxent Research Refuge and the Parkway are considered Section 4(f) resources under the U.S. Department of Transportation Act of 1988 (49 USC 3030(c)). Section 4(f) permits the use of land from a significant publically-owned public park, recreation area, wildlife or waterfowl refuge, or land of a historic site of national, state, or local significance (as determined by federal, state, or local officials having jurisdiction over the resource), only if there is no feasible or prudent alternative to the use of such land and if the action includes all possible planning to minimize harm to the protected property resulting from such use. A Section 4(f) "use" occurs when a property from a Section 4(f) resource is permanently acquired and incorporated into a transportation project or when there is occupancy of land that is adverse in terms of the statute's preservationist purposes of maintaining the integrity of the resource, or when there is a constructive use of land. In some cases, the project proponent(s) and the reasonable official(s) with jurisdiction over the resource may agree that a particular use of Section 4(f) land would have no adverse affect on the protected resources, resulting in a *de minimis* impact finding.

The project would have no direct impacts on the Patuxent Research Refuge or the associated ball fields located at the intersection of MD 198 and Bald Eagle Drive. However, there is a small area owned by Fort Meade, which is located between MD 198 and the ball fields that will be impacted by the proposed interchange options. This area is currently undeveloped and is used informally for overflow parking during ballgames. All four interchange options propose improvements to this area that create a paved parking lot that would provide 28 parking spaces.

The primary parking area for the ball fields is a gravel lot along Bald Eagle Drive, which is one of the access points to the Patuxent Research Refuge. This lot contains approximately 47 parking spaces. To offset the loss of the informal pull-over parking lot along MD 198, an improvement and expansion of the primary parking lot that is Patuxent Research Refuge-owned is proposed. These improvements to the lot would result in a paved 62 space lot and would result in no net change in parking spaces. In addition, further improvements at Bald Eagle Drive include a new traffic signal, with a median break and turn lanes onto MD 198.

MD 198 – FROM MD 295 TO MD 32

There is 0.94 acre of permanent impact and up to 8 acres of temporary impacts to the NPS-owned Baltimore-Washington Parkway property associated with construction of Alternative 4 Modified. Section 4(f) Evaluations quantify impacts through its 'use' definition - which uses ownership and time periods as factors. Refer to Section IV – Draft Section 4(f) Evaluation completed for the impacts to the Parkway.

Permanent changes to the NPS property resulting from Alternative 4 Modified include:

- a) 0.94 acre of impact from the addition of pavement needed to widen the southbound ramps to two lanes, a signal at the ramp intersection with MD 198, and the addition of a sidewalk and a path on MD 198,
- b) up to 0.43 acre of treeline impact. This impact will be refined during the next stage of project development when both ground level survey and tree survey are completed, and the design is finalized,
- c) 2.25 acres of new tree plantings, and
- d) 5.32 acres of temporary access for maintenance or construction activities (i.e., resurfacing and restriping the roadway and bridge pavement, and resetting the slopes supporting the ramp widening).

The bridge abutments and bridge facing will not be impacted.

The NPS places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. To help ensure the protection of natural and cultural resources and the quality of the visitor experience, the following protective measures would be implemented as part of the action alternative, under NPS monitoring.

During the construction period, SHA will follow all applicable federal and state regulations to minimize adverse effects including:

- Adherence to an erosion and sediment control plans completed in accordance with the Maryland Department of the Environment's 2011 Standards and Specifications for Soil Erosion and Sediment Control, including stabilization of all exposed soil or fill material at the earliest practicable date;
- Placement of excavated material on an upland site;
- Marking the vegetation clearing limits on construction documents and in the field to minimize the alteration of vegetation and wildlife habitat;
- Minimization of tree removal whenever possible;
- Incorporation of native tree planting;
- Replacement of trees at a 1:1 ratio, with SHA responsible for their viability for three years;
- Avoidance of construction during peak visitor use periods (e.g., weekday rush hour);
- Development of a safety plan (for workers, park personnel and park visitors) prior to the initiation of construction;
- Placement of construction fencing at the intersections of the construction area to discourage visitors from entering a construction site; and
- If archeological resources are discovered during construction, all work in the immediate vicinity of the discovery must be halted and SHA cultural resources staff notified, who, if necessary, will consult with the NPS and the State Historic Preservation Officer to ensure that the resources are protected.

b. Emergency Services

MD 198 – FROM MD 295 TO MD 32

SHA anticipates emergency response times would improve from the improvements associated with the build alternatives. SHA requested several emergency services within the study area to review the proposed alternatives and options for the project in terms of possible impacts on response times for emergency services. Anne Arundel County Fire and Police Departments stated that Alternative 4 appeared to provide the best response time for emergency vehicles. The Anne Arundel County Office of Emergency Management did not foresee any issues regarding emergency response, as the area in question has very limited service population and the proposed alternatives allow access for emergency vehicles. The emergency services correspondence is included in Appendix B. The signals proposed under Alternative 4 Modified will have signal preemption functions and therefore act the same as Alternative 4 did for emergency vehicles.

c. Pedestrians and Bicyclists

Between the Little Patuxent River and MD 32, MD 198 is signed as a designated bicycle route. This designation extends onto MD 32, east of the MD 198/MD 32 Interchange, to MD 175 and provides bicycle-compatible connectivity to the Odenton MARC Station and the Odenton Town Center. Bicycles and pedestrians are prohibited from MD 32 west of the MD 198/MD 32 Interchange. SHA plans to designate MD 198 as a bicycle route from MD 32 to Old Columbia Pike in Montgomery County. The Anne Arundel County Pedestrian and Bicycle Master Plan (2003) recommends improvements to enhance bicycle and pedestrian compatibility along MD 198 through the project limits.

There are no established pedestrian or bicycle facilities in the study area. The No-Build Alternative and Alternative 2 provide no pedestrian or bicycle facilities and make no improvements to study area access. Alternative 4 Modified proposes adding on-road bicycle lanes, a sidewalk and a shared-use pedestrian/bicycle path, which would improve access to MD 198 and increase pedestrian and bicyclist safety.

d. Transportation Facilities and Other

Bus service is not available along the MD 198 corridor from MD 295 to MD 32. The closest bus route is west of MD 295 in Maryland City.

MARC commuter-train service is not available in the study area, but the Odenton MARC Station and the Laurel MARC Station are located within a few miles of the project limits.

Tipton Airport is located in the study area along the south side of the MD 198/MD 32 Interchange. Plans indicate that Tipton will be redeveloped as a state-of-the-art general aviation facility.

The local transportation system should benefit under the build alternatives and interchange options as they allow more reliable travel through the study area, reducing congestion and increasing traveler safety along MD 198 and through the MD 198/MD 32 Interchange. Expanding the existing roadway would allow drivers to use the additional lanes during emergencies and construction and maintenance activities. Since roadway closures during those activities should be unnecessary, continuous service would be maintained.

e. Public Utilities

MD 198 – FROM MD 295 TO MD 32

Public water and wastewater service along MD 198 is unavailable within the study area with two exceptions. First, Fort Meade has a federally owned water and wastewater treatment plant near the MD 198/MD 32 Interchange, adjacent to the Little Patuxent River. Both systems actively support Fort Meade, the NSA Complex, D.C. Children's Center, the Woodland Job Center, Sarah's House, all Anne Arundel County Public Schools located on Fort Meade property, and Tipton Airport. Second, the National Park Service has recently approved a finding of no significant impact document for a water and sewer extension across the Parkway. This system would be used by the proposed Arundel Gateway development.

Electric service is available in the study area through the Baltimore Gas and Electric Company. The study area contains no natural gas service.

Neither the water or the wastewater system would be impacted by any of the build alternatives or interchange options. However, gas and electric lines would be relocated under the build alternatives.

C. Economic Environment

The following information is summarized from the *MD 198 Community Effects Assessment* (SHA, 2009):

1. Employment Characteristics

Based on the Census 2000 data in Table III-5, the average per capita income for Maryland and Anne Arundel County is \$25,614 and \$27,578, respectively, and the average per capita income for the study area is \$31,408. The per capita income for the study area is slightly higher than for the state and the county.

The Census 2000 data shows that 80 percent of the study area is employed. This employment rate is slightly higher than in Maryland (65 percent) and Anne Arundel County (71 percent).

The top two occupations, in descending order, in Maryland and Anne Arundel County are (1) management, professional, and related occupations; and (2) sales and office occupations. The State and County differ in their third-largest occupations: professional and related occupations in the state, and service occupations in the county. The top three occupations, in descending order, within the study area are (1) management, professional, and related occupations; (2) sales and office occupations; and (3) service occupations. Employers within the study area include Fort Meade, NSA, Tipton Airport, and a number of smaller businesses.

The majority of State, County, and study area residents drive a car, truck, or van to work without carpooling. Carpooling represents the second-highest mode of workforce transportation and public transportation represents the third-highest mode in the state, county, and study area.

Table III-5: Employment Characteristics

Characteristics	Maryland	Anne Arundel County	Study Area
Average Per Capita Income	\$25,614	\$27,578	\$31,408
Employed Population Percent	64.6	71.1	80.1
Primary Industries Employing Residents	Educational, health and social services; professional, scientific, management, administrative, and waste management services; and public administration	Educational, health and social services; professional, scientific, management, administrative, and waste management services; and public administration	Educational, health and social services; professional, scientific, management, administrative, and waste management services
Primary Occupations of Residents	Management, professional, and related occupations; sales and office occupations; and professional and related occupations	Management, professional, and related occupations; sales and office occupations; and service occupations	Management, professional, and related occupations; sales and office occupations; and service occupations.
Primary Modes of Transportation	Drive a car, truck, or van without carpooling (73.7 percent); carpooling (12.4 percent); and public transportation (7.2 percent)	Drive a car, truck, or van without carpooling (80.3 percent); carpooling (10.7 percent); and public transportation (2.5 percent)	Drive a car, truck, or van without carpooling (78.6 percent); carpooling (13.2 percent); and public transportation (4.5 percent)

2. Effects on Regional Employment Characteristics

The MD 198 corridor should experience increased use resulting from study area growth. Under the No-Build Alternative and Alternative 2, the current highway configuration would remain unchanged, and capacity and safety concerns would continue to grow, resulting in additional congestion and increased traffic hazards. Continuing traffic concerns could increase commute times and discourage trips along this portion of MD 198, as travelers choose less-congested routes. Changes in traffic patterns would affect regional economy and employment by reducing drive-by business in some areas and increasing it in others. Ultimately, the effect on businesses in the study area would be negative and regional growth patterns would be altered.

The implementation of build alternatives and any of the interchange options should affect regional economy and employment by decreasing congestion, increasing accessibility, and improving safety along the MD 198 corridor. The reduction in congestion could increase regional use of MD 198, resulting in increased drive-by business and higher rates of employment. Commuters and travelers from more congested routes within the region might choose to travel MD 198, thus decreasing drive-by business in some areas and altering regional growth patterns.

3. Effects on Local Employment Characteristics

The SHA anticipates a substantial increase in the use of the MD 198 corridor as a result of the projected growth of the study area and the additional growth expected from BRAC. Under the No-Build Alternative and Alternative 2, the current highway configuration would remain

MD 198 – FROM MD 295 TO MD 32

unchanged, and capacity and safety concerns would continue to grow, resulting in additional congestion and increased traffic hazards. Repeated traffic delays could increase commute times or discourage trips along this portion of MD 198, as travelers choose other routes. The reduction in drive-by business could negatively impact study area businesses and future growth.

The SHA expects that the implementation of the build alternatives and interchange options would have varying effects on the local economy and employment. Alternative 4 Modified would decrease congestion and increase safety and accessibility more than any of the other alternatives by widening the roadway and adding shared-use pedestrian/bicycle facilities, bicycle lanes, and sidewalks. The reduction in congestion could increase local and regional use of the MD 198 corridor, resulting in increased drive-by business opportunities and promoting future growth within the study area. Alternative 4 Modified would result in one commercial displacement, a barber shop located adjacent to the Arundel Gateway Development.

4. Tax Base

The 2009 property-tax rates for Anne Arundel County and the City of Laurel are identified below:

Anne Arundel County: \$0.888 per \$100 of assessed value of real property

City of Laurel: \$0.71 per \$100 of assessed value of real property

The general revenue for general property taxes collected for Fiscal Year 2007 was \$470,163,256. The County expected growth in the property-tax revenue for Fiscal Year 2008. The property tax collected from the City of Laurel in Fiscal Year 2008 was \$13,690,678. The City of Laurel projected that Fiscal Year 2009 property-tax revenue would increase to \$16,248,217.

As a result of the 2005 BRAC, the study area anticipates substantial increases through 2010 in population, housing, and commercial activity, and expects to add approximately 5,695 new on-base jobs at Fort Meade.

5. Effects to Tax Base

Because the No-Build Alternative and Alternative 2 would involve few, if any, roadway improvements beyond routine repairs and require no property acquisitions, the local tax base should experience no direct effects. Alternative 2 would require 10.8 acres of commercial ROW acquisition, which would reduce the value of the land from which they would be acquired by reducing the size of the properties.

Alternative 4 Modified would displace one commercial property and the acquisition of commercial and residential ROW. By using commercial land for transportation purposes, the project would reduce the tax base, and by reducing property sizes, the ROW acquisitions would reduce the value of the land from which they are acquired. The minor reduction in tax base would be offset in the future as tax revenue increases with study area growth.

As a result of the proposed expansion, MD 198 should become a well-traveled, congestion-free corridor with the potential to increase commercial growth. To take advantage of the improved

conditions, regional businesses may relocate and new businesses may establish themselves within the study area.

6. Compliance with Smart Growth Initiatives

The Smart Growth Initiative requires direct funding from the state for highways and economic development in areas designated as Priority Funding Areas (PFA). The MD 198 project limits are entirely within a PFA; therefore, regardless of the alternative selected, the project is in compliance with Smart Growth initiatives.

7. Livability Principles and Sustainability

As part of its Every Day Counts initiative, FHWA has established six principles of livability. Departments of Transportation are encouraged to be mindful of the following principles during project planning.

- **Provide more transportation choices** to decrease household transportation costs, reduce our dependence on oil, improve air quality, and promote public health.
- **Expand location and energy-efficient housing choices** for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.
- **Improve economic competitiveness of neighborhoods** by giving people reliable access to employment centers, educational opportunities, services and other basic needs.
- **Target federal funding toward existing communities** through transit-oriented mixed-use development and land recycling to revitalize communities, reduce public works costs, and safeguard rural landscapes.
- **Align federal policies and funding** to remove barriers to collaboration, leverage funding and increase the effectiveness of programs to plan for future growth.
- **Enhance the unique characteristics of all communities** by investing in healthy, safe, and walkable neighborhoods, whether rural, urban, or suburban.

In early 2009, an intermodal working group was formed to start shaping the U.S. Department of Transportation's (USDOT) vision of livability. Initial steps included the identification of all existing programs and authorities within the USDOT that already supported livability and drafting possible changes to these programs that would allow the USDOT to make livability a priority and make real improvements in the lives of American citizens.

In June 2009, the U.S. Department of Housing and Urban Development, USDOT, and the EPA united to form the Partnership for Sustainable Communities, an unprecedented agreement to coordinate federal housing, transportation, and environmental investments, protect public health and the environment, promote equitable development, and help address the challenges of climate change. The three agencies are working together to coordinate federal policies, programs, and resources to help urban, suburban, and rural areas and regions build more sustainable communities, to make those communities the style of development in the United States, and to

remove policy or other barriers that have kept Americans from doing so.

a. Effects on Livability Principles and Sustainability

The purpose of the MD 198 project is to improve capacity and traffic operations, increase vehicular and pedestrian safety, and support development in the study area. The proposed improvements will improve economic competitiveness of neighborhoods by giving people reliable access to Fort Meade and to the Parkway, educational opportunities, services and other basic needs. It will also support existing communities by supporting mixed-use development within an existing Priority Funding Area and by enhancing the unique characteristics of all communities by investing in healthy, safe and walkable neighborhoods. SHA has worked extensively with the Anne Arundel County officials to address local and regional transportation needs with respect to the development trends and setting of the communities.

Alternative 4 Modified will widen MD 198 to provide improved capacity and traffic operations to and from the commercial center of Fort Meade. It will provide a 16-foot-wide outside shared-use lane to accommodate bicyclists on the roadway as well as a five-foot-wide sidewalk (westbound) and an eight-foot-wide shared-use pedestrian/bicycle path (eastbound) for walkers and recreational bicyclists from the bridge over the Parkway to the ball fields. At this point the project narrows so that only a single sidewalk extends eastward to Fort Meade. In total, these features will provide a more walkable neighborhood.

These design efforts ensure that the project is being developed in concert with the growth elements of the three master plans: the GDP, the Jessup/Maryland City Small Area Plan, and the Odenton Small Area Plan. The project falls mainly within the Jessup/Maryland City Small Area Plan which recommends capacity improvements along MD 198 as a means to achieve its future land use goals. The project will address the needs identified in the land use plans by alleviating the predicted traffic congestion throughout the study area. In addition to improving community and commercial access, the project will provide improvements to pedestrian facilities.

D. Cultural Resources

Identification and evaluation of historic architectural and archeological resources were conducted in accordance with federal and state laws, which protect significant cultural resources. Background research and field surveys were conducted to facilitate identification of cultural resources. An Area of Potential Effect (APE) was delineated in which to identify resources and evaluate the potential impacts of those resources.

All cultural resources identified during the architectural and archeological surveys were evaluated for their eligibility to be included on the National Register of Historic Places (NRHP).

The NRHP criteria evaluates the significance of properties based on their integrity, and determine if those properties are associated with broad patterns of our history (Criterion A); or are associated with the lives of persons significant in our past (Criterion B); or that embody the distinctive characteristics of a type, period, or method of construction representing the work of a master, or have artistic value (Criterion C); or that yield information important in prehistory or history (Criterion D) (36 CFR 60.4, and National Register Bulletin No. 15).

A compliance report containing a historic context and property evaluations was submitted by EHT Tracerics Inc. to Maryland Historic Trust (MHT) for eligibility evaluations in August 2007; this report only included architectural history evaluations. After final plans were decided upon in the Spring of 2009, architectural and archeological cultural resource evaluations were continued. The architectural survey has been finished, but problems with land access at the D.C. Children’s Center/Oak Hill Property have delayed the completion of archeological survey. A preliminary report on the completed survey “Phase I Archeological Survey of Portions of MD 198 between MD 295 and MD 32, Anne Arundel County, Maryland” was completed in October of 2009.

All cultural resources identified were documented and submitted to MHT for eligibility determinations or to comment on the need for further evaluation.

1. Historic Standing Structures

“Historic standing structures” refers to any above-ground building, structure, district, or object that attributes to our cultural past. When these resources meet the criteria for listing in the NRHP, they are historic properties that must be considered under the requirements of the National Historic Preservation Act of 1966. The Parkway is listed on the NRHP and the Post Core of Fort Meade was determined to be eligible for listing in 2001. The D.C. Forest Center was determined to be eligible in 2007. The MHT concurred on November 4, 2009 and September 24, 2014 that the project would have no adverse effect on the D.C. Children’s Center - Forest Haven District and the Parkway (Appendix B). Please refer to Section IV – Draft Section 4(f) Evaluation for additional information concerning the *de minimis* determination for the Parkway.

The proposed build alternatives will affect the D.C. Children’s Center - Forest Haven District by closing the existing entrance and constructing a new shared entrance for the property, which will be located east of the existing entrance. Neither existing nor proposed entrances are located within the historic boundary of the D.C. Children’s Center; therefore, there will be no impacts from the proposed project.

The concrete and stone structure of the MD 198 bridge over the Parkway will not be altered; the proposed improvements are to the travel surface. Both build alternatives would minimally widen the off ramp from southbound Parkway at the intersection of MD 198, potentially add a signal, and maintain the ramp profile. Alternative 4 Modified would add an additional lane to the Parkway southbound on ramp. Signage and guardrail will be retained and either reinstalled or replaced in-kind. Additional native plantings, subject to NPS approval, will maintain the quantity of vegetation in the Parkway within a mile of the project area. Thus, the minor increase in the roadway section proposed by the build alternatives will not adversely impact the character defining features of the Parkway.

2. Archeological Resources

Archeological resources relate to evidences of past human occupation that can be used to reconstruct the lifeways of past peoples. These include sites, artifacts, environmental and all other relevant information, as well as the contexts in which they occur. All archeological (prehistoric and historic) sites must be evaluated for their eligibility for the NRHP by the MHT.

MD 198 – FROM MD 295 TO MD 32

A Phase I Archeological Survey in June and September of 2009 identified no archeological sites. The MHT concurred on November 4, 2009 that the project would have no adverse effect on archeological resources within the maximum limits of disturbance for the build alternatives (Appendix B).

E. Natural Environment

The following information is summarized from the *MD 198 Natural Environmental Technical Report* (SHA, 2009):

1. Topography, Geology, and Soils

Alternative 4 Modified will add a sidewalk along MD 198 eastbound roadway, a shared use path along MD 198 westbound roadway, and add a lane to the ramps from southbound Baltimore-Washington Parkway. To incorporate these improvements, approximately 0.71 acre of additional fill soil will be needed to tie back into the existing roadway. The existing topography of the slopes between the ramp lanes and MD 295 will be reset and reseeded after construction.

The study area lies within the Coastal Plain Province. Underlying geology includes a thin layer of Quaternary gravel, and sand covers the older formations. Mineral resources of the Coastal Plain are mostly sand and gravel. The landscape in this area consists primarily of level to gently rolling topography ranging from 100 feet in the Little Patuxent floodplain to about 220 feet above sea level.

The No-Build Alternative would have no anticipated impacts to topography or geology in the study area. The improvements associated with Alternative 2 would have only minor cut/fill requirements. The interchange options, roadway widening and ramp configuration changes with Alternative 4 Modified would require larger quantities of cut/fill. The use of two to one slopes and/or retaining walls along the roadway embankments would minimize the footprints of the mainline alternatives and interchange options on the topography and geology of the study area. Table III-6 shows the estimated cut/fill amounts for each alternative.

The study area contains hydric soils, prime farmland soils, and soils of statewide importance. However, as a result of extensive disturbance to study area soils, actual soil types may differ from the Soil Survey. Original soils within the area, especially those near the MD 198/MD 295 and MD 198/MD 32 Interchanges, have been graded, filled, paved or removed since the *Anne Arundel County Soil Survey* was published in 1975.

The No-Build Alternative and Alternative 2 would not increase erosion or sedimentation. Alternative 4 Modified and the interchange options would increase erosion and sedimentation primarily during the construction phase. Most erosion would be caused by the removal of vegetation and impervious surfaces during construction, which may lead to increased exposure of soils to weathering and stormwater runoff potential. Areas that remain exposed to stormwater runoff during the construction phase would have the greatest erosion and sedimentation potential.

Table III-6: Estimated Cut/Fill Amounts

Alternative	Estimated Cut/Fill (cubic yards)		
	Cut	Fill	Net Fill
Alternative 1	0	0	0
Alternative 2	4,373	8,294	3,921
Mainline Alternatives			
Alternative 4 Modified	59,000	83,000	24,000
Interchange Options			
Option A	38,169	49,253	11,084
Option C	34,104	45,569	11,465
Option D	23,042	70,955	47,913

In accordance with the Farmland Protection Policy Act (FPPA), since the soils that are being impacted are not on land that is agriculturally zoned, a Farmland Conversion Impact Rating form is not required for this project. Therefore, Prime Farmland Soils and Soils of Statewide Importance located/mapped within the study area are exempt from FPPA coordination.

For all of the build alternatives, keeping erosion and sedimentation to a minimum would be a priority. Several methods could be implemented to decrease erosion effects, including structural, vegetative and operational methods during construction. These control measures may include:

- seeding, sodding, and stabilizing slopes as soon as possible to minimize the exposed area during construction,
- stabilizing ditches at the tops of cuts and at the bottoms of fill slopes before excavation and formation of embankments,
- the proper use of sediment traps, silt fences, slope drains, water holding areas and other control measures, and
- the 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 sediment (E&S) control plan would be prepared and implemented in accordance with Maryland Department of the Environment (MDE) regulations. The grading and E&S control plans would minimize the potential for impacts to water quality from erosion and sedimentation that would occur before, during, and after construction. Furthermore, temporary and permanent controls would be reviewed and approved by MDE prior to initiation of construction. Measures to prevent erosion in highly susceptible areas (i.e., steep slopes) would be included in the E&S control plans when necessary.

2. Water Resources

a. Water Quality

The study area falls within one 8-digit watershed, the Little Patuxent River sub-watershed (02-13-11-05). According to the Code of Maryland Regulations (COMAR), the Little Patuxent River and its tributaries are classified as a Use I stream.

Water quality data were measured at each monitoring station including four stations upstream of MD 198 and four stations downstream of MD 198. The results are summarized in Table III-7.

The water quality is consistent with general expectations based on the type of stream and uses within the watershed.

Table III-7: Surface Water Quality Data (2009)

Parameter	Temperature (° C)	Conductivity (ms/cm)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)
UPSTREAM STATIONS					
Station # 1	11.09	0.514	13.32	6.92	9.08
Station # 2	10.21	0.473	12.26	6.70	8.36
Station # 3	10.3	0.477	12.37	6.64	8.43
Station # 4	10.11	0.469	12.14	6.52	8.28
AVERAGE	10.43	0.483	12.52	6.70	8.54
DOWNSTREAM STATIONS					
Station # 1	12.41	0.557	12.83	8.21	8.11
Station # 2	11.73	0.503	11.58	7.4	9.31
Station # 3	10.78	0.484	11.15	7.13	10.18

Parameter	Temperature (° C)	Conductivity (ms/cm)	Dissolved Oxygen (mg/L)	pH	Turbidity (NTU)
Station # 4	9.87	0.443	10.21	6.52	7.22
AVERAGE	11.20	0.497	11.44	7.32	8.71
TOTAL AVERAGE	10.81	0.490	11.98	7.01	8.62

Overall, in situ water quality measurements collected during the Spring 2009 baseline monitoring were all found to be within the acceptable limits set forth by COMAR for this area of the Little Patuxent River.

Surface water grab samples were also collected at each sampling station (Table III-8). The parameters of the analysis were selected according to the *Specifications for Consulting Engineers' Services, Volume II: Section IV, Project Development; Stage II, Final Project Planning*.

Table III-8: Surface Water Analytical Data (2009)

Monitoring Station		Upstream Stations				Downstream Stations			
Parameter	Units	#1	#2	#3	#4	#1	#2	#3	#4
Turbidity	NTU	8.5	7.8	2.6	2.3	2.4	2.1	1.9	1.7
Inorganic Anions									
Nitrate	mg/L	1.6	ND	1.6	1.5	1.6	2.1	1.8	1.8
Phosphorus	mg/L	ND	ND	ND	ND	ND	0.14	0.09	0.08
Residue									
Total Solids	mg/L	230	140	110	160	240	230	130	360
Suspended Solids	mg/L	17	9	4	3	2	2	1	2
RCRA Metals									
Barium	ug/L	80	35	76	75	77	43	55	57
Fecal Coliform									
E-Coli	MPN/100ml	11.9	326	9.6	8.4	16.1	7.5	12.1	10.9

MD 198 – FROM MD 295 TO MD 32

The acceptable standard for turbidity in the Little Patuxent River is less than 150 NTUs. Therefore, the turbidity levels observed in the laboratory analysis are minimal and do not pose a major concern. The levels of nitrates and phosphorus observed within the study area are consistent with levels observed throughout the watershed. The barium detections in the Little Patuxent surface water samples ranged from 35 ug/L to 80 ug/L. Therefore, the levels of barium detected in the laboratory analysis are minimal and do not pose a major concern. The barium detections in the Little Patuxent surface water samples ranged from 35 ug/L to 80 ug/L. Therefore, the levels of barium detected in the laboratory analysis are minimal and do not pose a major concern. Extremely low E. Coli levels were detected at all monitoring stations except Station #2 of the upstream section where the laboratory analysis detected the presence of E. coli at 326 MPN/100ml. According to COMAR 26.08.02.03-3, this level is unsuitable for moderately frequent and frequent full body contact during recreation in the stream; however, this level would be suitable for occasional to infrequent full body contact during recreation in the stream.

Maryland Biological Stream Survey (MBSS) sampling data was available for the Little Patuxent River sub-watershed. Five sample locations were located within this sub-watershed. Based on these samples recorded by the MBSS between 2000 and 2004, Fish Index of Biotic Integrity (IBI) scores ranged from good to poor with two sites rated as good (40 percent), two sites rated as fair (40 percent), and only one site rated as poor (20 percent). However, mostly all sample locations were rated as having poor Benthic IBI scores (80 percent), with only one site rated as fair (20 percent) (Table III-9).

Table III-9: Descriptions of Stream Biological Integrity Associated with IBI Scores

IBI Score	Narrative Integrity Class	Characteristics
4.0-5.0	Good	Comparable to reference streams considered to be minimally impacted. Falls within upper 50% of reference site conditions.
3.0-3.9	Fair	Comparable to reference conditions, but some aspects of biological integrity may not resemble the qualities of these minimally impacted streams. Falls within the lower portion of the range of reference sites (10 th to 50 th percentile).
2.0-2.9	Poor	Significant deviation from reference conditions, with many aspects of biological integrity not resembling the qualities of these minimally impacted streams, indicating some degradation.
1.0-1.9	Very Poor	Strong deviation from reference conditions, with most aspects of biological integrity not resembling the qualities of these minimally impacted streams, indicating severe degradation.

Alternative 2 would increase the impervious area in the project area by 1.5 acres, Alternative 4 Modified would add 13.9 acres, and the interchange options would add 2.4 to 7.3 acres. These changes to impervious surfaces within the drainage area of the watershed would be minimal and are unlikely to impact surface water quality. Water quality data collected in the field is well within the acceptable limits set forth in COMAR.

While this study demonstrates that the proposed improvements to MD 198 would have minimal effects on the surrounding natural resources, and particularly surface water quality, the construction practices utilized during the actual construction of the roadway have the potential to create impacts beyond those demonstrated here. In order to address and minimize these potential

impacts, the usage of Best Management Practices (BMPs) must be adhered to. Included in these

actions are sediment and erosion control practices, stormwater management controls, environmental site design practice, minimization of vegetation impacts particularly to those within riparian or wetland buffers, and other general construction practices.

The standard operating procedures of SHA provide consideration for BMPs for roadway construction. Utilization of these standards and compliance with all relevant Federal, State, and local guidelines addressing protection of natural resources would provide assurances that the surface water quality of the Little Patuxent River will remain consistent with pre-construction conditions.

b. Floodplains

A review of the Federal Emergency Management Agency (FEMA) 100-year floodplain mapping reveals that the 100-year floodplain of the Little Patuxent River crosses the project area.

The proposed project was evaluated with respect to potential impacts on regulated floodplains. Alternatives 1 and 2 would not impact any floodplains within the study area. The anticipated permanent impacts to the Little Patuxent River floodplain for Alternatives 4 Modified and the interchange options are presented in Table III-10.

Table III-10: Estimated Impacts to 100-Year Floodplains

Alternative	Impact (acres)
Alternative 1	0
Alternative 2	0
Mainline Alternatives	
Alternative 4 Modified	0.1
Interchange Options	
Option A	2.4
Option C	2.4
Option D	2.4

c. Aquatic Habitat

One single fish blockage (a dam) was identified within the study area at the bridge where MD 198 crosses two sections of the Little Patuxent River. The dam is located beneath the bridge, and utilizes a working fish ladder to facilitate the free passage of fish within the stream channel. There were no other fish blockages observed within the vicinity of the study area.

Several areas of woody debris were observed within the stream channel that would benefit the fish habitat; however there was nothing that would create a fish blockage. A significant amount of trash was observed within and around the stream channel from illegal dumping and roadside debris. The trash does pose a minimal threat to the overall health of the fish population within the study area.

On August 12, 2009, SHA conducted fish sampling collections at two locations in Little Patuxent River. One location was upstream (Upstream Station #1) and the other was

MD 198 – FROM MD 295 TO MD 32

downstream (Downstream Station #4) of the MD 198 crossing. Fish sampling methods outlined in the *Maryland Biological Stream Survey Sampling Manual: Field Protocols* were followed. The upstream and downstream sites represent the reaches of the Little Patuxent that most closely resembled the low flow conditions described in the manual.

At the Upstream Station #1, located approximately 3,000 feet upstream from the intersection of the Little Patuxent and MD 198, the sample consisted of 14 unique species and 158 individuals collected. The most dominant species in the collection was *Rhinichthys atratulus* (Blacknose Dace) with 47 individuals collected. Fish IBI scores for the upstream sample collection are summarized in Table III-11.

Table III-11: IBI Scores for Upstream Station #1 (2009)		
Metrics	Value	Score
Number of Native Species (adjusted by stream size)	9	5
Number of Benthic Fish Species (adjusted by stream size)	2	5
Number of Intolerant Species (adjusted by stream size)	3	5
Percent Tolerant Fish	50%	5
Percent Abundance of Dominant Species	29%	5
Percent Generalists, Omnivores, and Invertivores	85%	5
Number of Individuals per Square Meter	.185	1
Biomass (g) per Square Meter	3.175	1
Final IBI Score	4.00 (Good)	

At the Downstream Station #4 site, located approximately 1,600 feet downstream from the intersection of the Little Patuxent and MD 198, the total fish capture included 10 unique species and 109 individuals. *Lepomis macrochirus* (Bluegill) was the most dominant species in the collection at a total of 53 individuals. Fish IBI scores for the downstream sample collection are summarized in Table III-12.

Table III-12: IBI Scores for Downstream Station #4 (2009)		
Metrics	Value	Score
Number of Native Species (adjusted by stream size)	7	5
Number of Benthic Fish Species (adjusted by stream size)	1	3
Number of Intolerant Species (adjusted by stream size)	1	5
Percent Tolerant Fish	60%	3
Percent Abundance of Dominant Species	49%	3
Percent Generalists, Omnivores, and Invertivores	100%	1
Number of Individuals per Square Meter	.127	1
Biomass (g) per Square Meter	3.175	1
Final IBI Score	2.75 (Poor)	

Upon calculation of the Fish IBI scores at the collection sites, it was determined that the upstream reach is minimally impacted, whereas the downstream reach was observed to be in poor condition and demonstrates a significant deviation from a minimally impacted site.

There would be no project related impacts to fish under any of the build alternatives and

Environmental Assessment & DRAFT Section 4(f) Evaluation III-36

interchange options. No instream work is anticipated, however it is not permitted in Use I streams during the period of March 1st through June 15th, of any given year.

d. Waters of the United States (WUS)

Wetland identification and delineation efforts occurred during December 2008 in accordance with the *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* (Department of the Army Waterways Experiment Station, 1987) and supplemental guidance (**Figures III-5A** thru **III-5K**).

Impacts to WUS and wetlands for each of the build alternatives and interchange options are summarized in Tables III-13 and III-14. Alternative 2 would have 0.7 acre of permanent impacts to wetlands and 71 linear feet of permanent WUS impacts. Alternative 4 Modified would permanently impact 1.4 acres of wetlands and 459 linear feet of WUS. The interchange options would permanently impact between 0.9 and 2.6 acres of wetland and between 93 and 445 linear feet of WUS.

Table III-13: Estimated Impacts to Waters of the United States*

Alternative	WUS Impacts			
	Permanent (linear feet)	Permanent (square feet)	Temporary** (linear feet)	Temporary** (square feet)
Alternative 1	0	0	0	0
Alternative 2	71	356	0	0
Mainline Alternative				
Alternative 4 Modified	459	1,994	105	505
Interchange Options				
Option A	93	976	266	10,569***
Option C	190	1,476	460	11,375***
Option D	252	2,169	304	10,723***

*For a detailed breakdown of WUS types for all permanent and temporary impacts refer to Appendix A.

**All temporary impacts were calculated using a 15 foot offset from the cut/fill line.

***All temporary impacts square footage includes the bridge span crossing over Little Patuxent River.

Table III-14: Estimated Impacts to Wetlands*

Alternative	Wetland Impacts			
	Permanent (acres)	Permanent (square feet)	Temporary** (acres)	Temporary** (square feet)
Alternative 1	0	0	0	0
Alternative 2	0.7	28,181	0	270
Mainline Alternatives				
Alternative 4 Modified	1.4	58,631	0	0
Interchange Options				
Option A	1.9	83,382	1.1	46,156
Option C	0.9	38,018	0.8	34,392
Option D	2.6	112,747	1.3	55,308

*For a detailed breakdown of wetland types for all permanent and temporary impacts refer to Appendix A.

**All temporary impacts were calculated using a 15 foot offset from the cut/fill line.

MD 198 – FROM MD 295 TO MD 32

DNR indicated that there is a Non-Tidal Wetland of Special State Concern (NTWSSC) (WET-19) and associated 100-foot upland buffer located south of MD 198 along the Little Patuxent River. The 100-foot buffer would be impacted by each of the interchange options. Approximately 11,380 square feet of the 100-foot buffer would be permanently impacted, while temporary impacts would total 3,295 square feet.

Avoidance and Minimization

For the build alternatives and interchange options, avoiding and minimizing impacts to wetlands and WUS will be a priority as the project progresses through design. Avoidance and minimization of impacts to wetlands and WUS may involve the design of steeper fill slopes and/or a retaining wall in the vicinity of the wetlands and/or WUS identified along the mainline and within and around the MD 198/MD 32 Interchange. Minimization efforts at this stage of the planning process have included decreasing right-of-way impacts through design and construction techniques as allowed under the American Association of State Highway and Transportation Officials guidelines. Specifically, total shoulder widths were reduced from 12 feet to 4 feet wherever feasible.

Wetland mitigation could involve creating wetlands of comparable function and value to those impacted by construction, or restoration and/or enhancement of existing wetlands. Mitigation for waterways could involve creation or restoration of waterways, creation or enhancement of riparian buffers, and/or removal of fish passage impediments and creation or enhancement of fish habitat. A mitigation site search will be conducted during the next stage of project planning, and summarized in the FONSI, which is the anticipated final document for this project. Mitigation would target both on-site and off-site locations within the watershed.

Aquatic resources and water quality would be protected by the Use I in-stream work restriction, proper application of an approved Erosion and Sediment Control Plan, and other Best Management Practices (BMPs) that meet the 2000 Maryland Stormwater Design Manual. Generally, no in-stream work is permitted in Use I streams from March 1 to June 15, inclusive, during any year.

Short and long term impacts would also be avoided and minimized through strict adherence to the *Maryland Stormwater Management Guidelines for State and Federal Projects*. The stormwater management guidelines became effective on July 1, 2001, and supplement the Stormwater Management Regulations (COMAR 26.17.02) and the *Maryland Stormwater Design Manual, Volumes I and II*. The stormwater guidelines provide information necessary for submittal of stormwater management plans to the MDE Water Management Administration for review and approval. Additional avoidance, minimization and mitigation measures will be identified in the final environmental document.

3. Groundwater

The groundwater in the study area is obtained from the Patapsco aquifer. Groundwater contamination from construction activities would be minimized by implementation of BMPs. Temporary BMPs that would be utilized during construction activities include: using silt fence, re-vegetating disturbed areas, and designing grassed channels to control sediment and erosion from the work site. Permanent BMPs that would be utilized during construction activities and remain in place afterward would include stormwater management ponds and biofiltration systems, such as grassed medians and grassed drainage swales.

4. Terrestrial Habitat

e. Forest/Woodlands

The project area within the Parkway is lawn with a thin fringe of tree buffer between the ramps and the adjacent commercial and utility uses to the west and east. The improvements within the Parkway will add impervious surface to the mainline with a sidewalk and path, and to the southbound ramps to MD 295 with lane widening. The potential exists for up to 0.43 acre of treeline impact from these improvements across all four quadrants of the interchange.

Forest stands within the study area exist but have been fragmented directly or indirectly by agriculture, urbanization, timber harvesting and natural factors. There are no old-growth forests identified within the study area. The largest blocks of continuous forests are located along the Little Patuxent River floodplain and along the southern portion of the study area adjacent to the Patuxent Research Refuge. Forest land within the study area is primarily associated with stream buffers, wetlands, and undeveloped areas on private lands. The forest stands in the eastern portion of the study area are smaller in size because of the Ft. Meade base and associated development in this area. The study area contains four associations; the Willow Oak-Loblolly Pine Association, the Tulip Poplar Association, the River Birch-Sycamore Forest Association, and the Sycamore-Green Ash-Box Elder-Silver Maple Forest Association.

Permanent impacts to forests would involve the conversion of forested habitat to impervious road and associated infrastructure, and forest fragmentation where new roads would bisect existing habitat (Table III-15). However, because Alternatives 2, 4 Modified, and the interchange options are generally along the existing alignment, the majority of these impacts would occur to the existing forest edge and/or to narrow rows of trees next to the roadway. Worst-case permanent forest impacts would be 25.73 acres which includes the worse case potential impact of 0.43 acre of treeline impact within the Baltimore-Washington Parkway.

Table III-15: Estimated Forest Impacts

Alternative	Forest
Alternative 1	0
Alternative 2	4.5
Alternative 4 Modified	19.4- 19.83
Interchange Options	
Option A	5.1
Option C	4.6
Option D	5.9

Comment [h4]: Robert: this table is a little unclear... is that range the 0.43 acres we are unsure of? Maybe clarify that

Karen: I checked with the Project Manager – the new calculations of tree impacts *in the Parkway* (from putting the LOD on an aerial) – were already contained in the project estimate of forest impacts (which were generated years ago by the same method). So, long story short, I revised the Alt4 Mod impact number in Table III-15 and the text.

Avoidance and Minimization Measures

The project would comply with applicable laws and regulations regarding forest impacts. 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:

1. May cut or clear only the minimum number of trees and other woody plants that are

- necessary and consistent with sound design practices, and
2. Shall make every reasonable effort to minimize the cutting or clearing of trees and other woody plants

The Reforestation Law also requires the replacement, on public land, for removed wooded areas or contribution to the State Reforestation Law Fund. These mitigation measures are required on an acre-for-acre (1:1) basis for impacts to one acre or more of forest. SHA will replace the trees impacted on NPS land at a 1:1 ratio with three years of maintenance to ensure survivability.

f. Large and Significant Trees

A large and significant tree survey was conducted concurrent with the wetland investigation during December 2008. There were 20 significant trees identified throughout the study area. None are within the right-of-way of the Baltimore-Washington Parkway.

Comment [h5]: Robert: are there 20 significant trees within the 0.43 acres, or somewhere else?

There would be no large or significant trees impacted by Alternatives 1, 2, or 4 Modified. Interchange Option A would impact nine and Interchange Options C and D will impact 10 significant trees. A significant tree is considered impacted if any portion of the Critical Root Zone (CRZ), the region measured outward from a tree trunk representing the area of the roots that must be maintained or protected for the tree's survival, is disturbed in any fashion. Significant trees are removed when more than 30% of the CRZ is impacted, as the tree will not be able to survive.

5. Wildlife

a. Terrestrial Wildlife

Wildlife was observed throughout the study area, primarily in naturally forested areas, fields, wetlands and wildlife corridors occurring along floodplains and greenways. Observations in the study area indicate the presence of white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), opossum (*Didelphis marsupialis*), eastern chipmunk (*Tamias striatus*), gray squirrel (*Sciurus carolinensis*), woodchuck (*Marmota monax*), red fox (*Vulpes fulva*), gray fox (*Urocyon cinereoargenteus*) and eastern cottontail (*Sylvilagus floridanus*). Herptiles present within the study area include green frog (*Rana clamitans*), spring peeper (*Pseudacris crucifer*), gray tree frog (*Hyla versicolor*), garter snake (*Thamnophis sirtalis*), American toad (*Bufo americanus*), wood frog (*Rana sylvatica*), black ratsnake (*Elaphe obsoleta*) and snapping turtle (*Chelydra serpentina*). Observed signs of mammals and herptiles included actual sighting, observed tracks and scat, road-kill, habitat, dwellings and breeding calls.

The No-Build Alternative and Alternative 2 would have no impact on terrestrial habitat and therefore no effect on terrestrial wildlife within the study area. Since Alternative 4 Modified and the interchange options would only expand the existing roadway, minimal impact on the wildlife communities within the study area is anticipated. Generally, road widening pushes back existing roadside edge area. Roadside edge habitat is broadly defined as the area influenced by roadway drainage, slope limits, sun light penetration or maintenance activity. However, roadway widening is of special concern when improvements impair the passage of wildlife between areas of adjacent habitat. Alternative 4 Modified and the interchange options would not affect the passage of wildlife in or out of the good habitat areas.

b. Rare, Threatened, and Endangered Species

On December 28, 2006, the Maryland Department of Natural Resources (DNR) Environmental Review Unit indicated that the Fisheries Service has documented spawning activities of both white perch (*Morone americana*) and herring (*Alosa sp.*) in the Little Patuxent River near the project area. These fish species should be adequately protected by the Use I instream work prohibition period (March 1st through June 15th). Additional correspondence from DNR on December 28, 2006 indicated the presence of state threatened *Etheostoma vitreum* (glassy darter) and *Lampetra appendix* (American brook lamprey) in the area where MD 198 crosses the Little Patuxent River. The DNR recommended a time of year restriction from March 1st to June 15th for any in-stream work. Coordination with the U.S. Fish and Wildlife Service (USFWS) on January 19, 2007, indicated that there were no federally proposed or listed endangered or threatened species known to exist in the project area. Please refer to Section V and Appendix B for all correspondence between SHA, DNR, and USFWS referencing rare, threatened, and endangered species in the study area.

6. Benthic Macroinvertebrates

Benthic samples were collected at eight monitoring locations in accordance with the Maryland Biological Stream Survey (MBSS) protocols developed by the DNR. Sampling was performed in a riffle area when present. Sampling also occurred in habitats such as gravel/broken peat and/or clay lumps in a run area, snags/logs that create a partial dam or in a run habitat, undercut banks and associated root mats in moving water, submerged aquatic vegetation and associated bottom substrate in moving water, and detrital/sand areas in moving water.

Results of the benthic macroinvertebrate analysis identified an average of 76 individuals in each samples collected in the Little Patuxent River upstream of MD 198. There were an average of 127 individuals in each of the samples collected downstream of MD 198. A Hilsenhoff Biotic Index (HBI) score was calculated using tolerance values for each individual sample that was collected. Table III-16 summarizes the data that was received from the benthic macroinvertebrate laboratory analysis for the upstream and downstream stations. All analytical results can be found in the *MD 198: MD 32 to MD 295, Water Quality and Aquatic Habitat Survey*.

Table III-16: HBI Score for MD 198 Stations (2009)

Station	HBI Score	Quality
Upstream 1	7.51	Poor
Upstream 2	8.08	Poor
Upstream 3	6.40	Fair
Upstream 4	6.91	Fairly Poor
Downstream 1	8.03	Poor

Table III-16: HBI Score for MD 198 Stations (2009)

Station	HBI Score	Quality
Downstream 2	8.29	Poor
Downstream 3	8.20	Poor
Downstream 4	7.99	Poor

The HBI scores show that the upstream water quality is slightly better than the downstream water quality. The average of the upstream HBI Scores is 7.22 (fairly poor)

and the downstream HBI scores average 8.21 (poor). Upstream stations exhibited greater numbers of individuals that are sensitive to pollution, such as the *Maccaffertium* (mayfly). The dominance of pollution tolerant taxons at all stations signifies that water quality is impaired throughout this portion of the Little Patuxent; however this is consistent with the water quality for the remainder of the watershed.

While this study demonstrates that the build alternatives and interchange options would have minimal effects on the surrounding natural resources, and particularly surface water quality, BMPs must be adhered to in order to minimize potential impacts due to construction. Included in these actions are sediment and erosion control practices, stormwater management controls, environmental site design practice, minimization of vegetation impacts particularly to those within riparian or wetland buffers, and other general construction practices.

The standard operating procedures of SHA provide ample consideration for BMPs for roadway construction. Utilization of these standards and compliance with all relevant federal, state and local guidelines addressing protection of natural resources will provide assurances that the surface water quality of the Little Patuxent River will remain consistent with pre-construction conditions.

7. Unique and Sensitive Areas

a. Maryland's Green Infrastructure

The GreenPrint Program (2001) was established by the Maryland General Assembly in an effort to “preserve the most ecologically valuable natural lands in Maryland” (Maryland’s Green Infrastructure Assessment, 2003). These areas have been identified in DNR’s Green Infrastructure data set, which was created using satellite imagery, road and stream locations, and biological data. Identified areas include unfragmented natural areas, called “hubs”, which include large blocks of contiguous interior forest and large wetland complexes; linear stretches of land, called “corridors”, such as stream valleys that allow animals and seeds to move between “hubs”; and areas of disconnect between the “hubs” and “corridors”, called “gaps”.

The SHA, in coordination with County planners and the regulatory agencies, will use green infrastructure data in the planning process to locate areas of land that could be targeted for protection or restoration to help ensure habitat for Maryland’s plants and wildlife, as well as to promote a healthier environment including improved outdoor recreation, clean drinking water, and erosion prevention. At the time Maryland’s Green Infrastructure Assessment (2003) was published, it was determined that 74 percent of Maryland’s Green Infrastructure is unprotected; and 13 percent of hubs and less than one percent of corridors were in areas managed primarily for natural values.

The study area contains green infrastructure hubs, corridors, and gaps. All of the impacts associated with the Alternatives 2, 4 Modified, and the interchange options are from the proposed widening of MD 198 and the ramp improvements to the MD 198/MD 32 Interchange. Alternative 4 Modified would result in the most impacts to green infrastructure. All interchange option impacts are similar. Green infrastructure impacts resulting from Interchange Options A through D are shown in Table III-17 below.

Table III-17: Impacts to Green Infrastructure

Alternative			
Alternative 1	0.0	0.0	0.0
Alternative 2	0.0	1.7	0.6
Alternative 4 Modified	4.1	9.4	3.9
Interchange Option A	5.5	0.0	4.3
Interchange Option C	5.5	0.0	4.3
Interchange Option D	5.4	0.0	4.2

The project’s total mitigation package (wetlands, WUS, and forest) would prioritize sites that are within or in close proximity to Maryland’s green infrastructure network, focusing on the obvious gap areas first. Part of the mitigation package could include protecting areas of the green infrastructure network that are not currently protected.

b. Scenic River and Research Refuge

The Little Patuxent River is recognized as a scenic river under the Maryland Scenic and Wild Rivers Program. Also, the Patuxent Research Refuge is a nationally recognized wildlife refuge that is located to the south of the project area.

The current crossing over the Little Patuxent River floods the roadway during heavy rain events. All of the interchange options include a new bridge span across the Little Patuxent River that would eliminate the flooding that currently occurs at this crossing. The new bridge span would also allow the current fish ladder located at the crossing to remain intact. It is not anticipated that any in-stream work is necessary for the construction of the proposed bridge span. Other than the wider and longer span over the Little Patuxent River, there are no other improvements associated with interchange options that would impact the Little Patuxent River. SHA will continue to coordinate with DNR during the project planning phase to ensure that all measures are taken to avoid and/or minimize impacts to the Little Patuxent River.

None of the interchange options would impact the Patuxent Research Refuge.

F. Air Quality

A project-level air quality analysis was conducted in accordance with U.S. Environmental Protection Agency (EPA) and Federal Highway Administration (FHWA) guidelines. The purpose of this project-level air quality analysis was to evaluate the potential effects of the proposed alternatives on the air quality, including the analysis of carbon monoxide (CO), fine particulate matter 2.5 microns or smaller in size (PM2.5), and Mobile Source Air Toxics (MSATs). Refer to the Air Quality Technical Report MD 198: Russett Green (West Of MD 295) To MD 32 (May, 2009) for details on the technical analysis and its components.

1. Attainment Status

Under the authority of the CAA, the U.S. Environmental Protection Agency (EPA) has

Environmental Assessment & *DRAFT* Section 4(f) Evaluation III-43

MD 198 – FROM MD 295 TO MD 32

developed National Ambient Air Quality Standards (NAAQS) for certain air pollutants (criteria pollutants) deemed harmful to public health and the environment. These criteria pollutants include: nitrogen dioxide (NO₂), sulfur dioxide (SO₂), CO, ozone (O₃), PM_{2.5}, PM₁₀, and lead (Pb).

The EPA designates areas where ambient concentrations are below the NAAQS as being in “attainment” and designates areas where a criteria pollutant level exceeds the NAAQS as being in “nonattainment.” Ozone (O₃) nonattainment areas are categorized based on the severity of pollution: marginal, moderate, serious, severe, or extreme. The project area is designated as moderate nonattainment for O₃ under the eight-hour standard and as nonattainment for PM_{2.5}. In addition, although the area is an attainment area for CO, the Baltimore Central Business District is under a CO Maintenance Plan, which provides for continued attainment of the CO standard through December 15, 2015.

The Baltimore Regional Transportation Board (BRTB) is the regional agency that prepares the State Implementation Plan (SIP), which documents how the Baltimore, MD region will meet the NAAQS. The SIP provides an inventory of existing air emissions and accounts for planned projects within the region that have potential to increase pollutant emissions. The SIP accounts for general increases in vehicular travel throughout the region, as well as anticipated changes in land use and demographic/employment patterns.

2. Carbon Monoxide Micro-scale Evaluation

Carbon monoxide (CO) impacts were analyzed as the accepted indicator of vehicle-generated air pollution. The EPA CAL3QHC (1993) dispersion model was used to predict CO concentrations for air quality sensitive receptors for the Open to Traffic (2015) year and Design year (2030). The detailed analyses predicted air quality impacts at each receptor location from CO vehicular emissions for the No-Build and build alternatives. Modeled one-hour and eight-hour average CO concentrations were added to background CO concentrations (1.4 ppm one-hour and 0.9 ppm eight-hour) for comparison to the State and National Ambient Air Quality Standards (S/NAAQS). The objective of the analysis is to evaluate the effect(s) of the proposed improvements to the MD 198 in Anne Arundel County, Maryland on the local ambient air quality relative to the NAAQS. Air quality is assessed to determine whether the proposed transportation improvement project conforms to the 1990 Clean Air Act Amendments (CAAA).

Air quality receptors were selected to represent air quality sensitive locations within the study area. These consist of 25 at the MD 198/MD 295 Interchange, 11 at the MD 198/MD 32 Interchange, and 25 at the MD 198/Russett Green Intersection. In addition one receptor was selected to represent the Welch’s Trailer Park and two were selected to represent baseball fields at Bald Eagle Road. The analysis indicates that the one-hour and eight-hour concentration of CO would not exceed the NAAQS at any receptor locations within the project area for any of the design alternatives and options. The one-hour CO NAAQS is 35 ppm and the eight-hour NAAQS is nine ppm.

The CAL3QHC model comparisons between the build alternatives and the No-Build Alternative demonstrate that the highest CO concentrations occur at the same location in both 2015 and 2030. The maximum calculated one-hour No-build CO concentration is 7.3 ppm in 2015 and 7.2 ppm in 2030. The maximum calculated eight-hour No-build CO concentration is 4.4 ppm in 2015 and 4.3 ppm in 2030. These maximum concentrations occur at the MD 198/Russett Green intersection. The maximum calculated one-hour Build CO concentration is 6.1 ppm in 2015 and

6.0 ppm in 2030. The maximum calculated eight-hour Build CO concentration is 3.3 ppm in 2015 and 3.3 ppm in 2030. These maximum concentrations occur at the MD 198/MD 295 Interchange.

1. PM_{2.5} Regional and Hot-Spot Conformity Determination

The project area is located in Anne Arundel County, Maryland, which is in the Baltimore, MD PM_{2.5} nonattainment area. The area was designated as nonattainment for PM_{2.5} on January 5, 2005 by the EPA. This designation became effective on April 5, 2005, 90 days after EPA's published action in the Federal Register. Transportation conformity for the PM_{2.5} standards applied on April 5, 2006, after the one-year grace period provided by the Clean Air Act.

The Baltimore Regional Transportation Board (BRTB) of the Baltimore Metropolitan Council (BMC) is the federally recognized Metropolitan Planning Organization (MPO) for transportation planning in the Baltimore region. Annually, the BMC and the BRTB develop the region's Constrained Long Range Plan (CLRP) and the Transportation Improvement Program (TIP). The CLRP for the region is called "The Transportation Outlook 2035". The CLRP is a comprehensive plan of transportation projects and strategies that the Transportation Board realistically anticipates can be implemented over the next 20 years. The 2008-2012 TIP is a five-year program that describes the time frame for federal funds to be obligated to state and local projects. Each year the TIP is approved after the BRTB ensures that it meets the federal requirements relating to air quality and is in conformity with the SIP. The Transportation Outlook 2035 and 2008-2012 TIP were adopted by the Baltimore Regional Transportation Board (BRTB) on November 27, 2007. The MD 198 project is included in the Maryland Department of Transportation's (MDOT) Consolidated Transportation Program (CTP) as Anne Arundel County Line 8. Although it is currently referenced as a study² in the CLRP, it is not included as a specific project in the currently approved CLRP or in the current TIP. Upon determination of a Selected Alternative and the provision of federal funding, the project will be analyzed as part of the BRTB regional emissions analysis.

On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter: "PM_{2.5} and PM₁₀ Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New PM_{2.5} and Existing PM₁₀ National Ambient Air Quality Standards" (71 FR 12468). These rule amendments require the assessment of localized air quality impacts of Federally-funded or approved transportation projects in PM₁₀ and PM_{2.5} nonattainment and maintenance areas deemed to be *projects of air quality concern*³ as enumerated in 40 CFR 93.123(b)(1).

SHA has prepared the following assessment of the proposed improvements:

- The MD 198 Project is considered under 40 CFR 93.123(b)(1)(i), as amended, which includes *"New or expanded highway projects that have a significant number of or significant increase in diesel vehicles"*
- The MD 198 Project is also considered under 40 CFR 93.123(b)(1)(ii), as amended, which includes *"Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project"*
-

- The proposed construction would improve the operation and safety of MD 198, and provide sufficient capacity to address existing and projected travel demands throughout PM_{2.5} emissions.
- Section 176(c) of the Clean Air Act and the federal conformity rule require that transportation plans and programs conform to the intent of the state implementation plan (SIP) through a regional emissions analysis in PM_{2.5} nonattainment areas. The Baltimore Regional Transportation Board (BRTB) of the Baltimore Metropolitan Council (BMC) is the federally recognized Metropolitan Planning Organization (MPO) for transportation planning in the Baltimore region. The BMC
- and the BRTB develop the region’s Constrained Long Range Plan (CLRP) and the Transportation Improvement Program (TIP). The CLRP for the region is called “The Transportation Outlook 2035”. The 2008-2012 TIP is a five-year financial program that describes the schedule for obligating federal funds to planned state and local transportation projects. Each year the TIP is approved after the BRTB ensures that it meets the federal requirements relating to air quality and is in conformity with the SIP. The Transportation Outlook 2035 and 2008-2012 TIP were adopted by the Baltimore Regional Transportation Board (BRTB) on November 27, 2007. The MD 198 project is included in the Maryland Department of Transportation’s (MDOT) Consolidated Transportation Program (CTP) as Anne Arundel County Line 8. Although it currently referenced as a study⁴ in the CLRP, it is not included as a specific project in the currently approved CLRP or the current TIP. Upon determination of a Selected Alternative and the provision of federal funding, BRTB will include the project as part of their regional emissions analysis.
- Based on the above preliminary review and analysis, SHA proposes that the MD 198 Project (including all options) is not a project of air quality concern as defined under 40 CFR 93.123(b)(1)(i) & (ii). Since the project would meet the Clean Air Act and 40 CFR 93.109 requirements, the project would not be expected to cause or contribute to a new violation of the PM_{2.5} NAAQS, or increase the frequency or severity of a violation. Upon determination of a Selected Alternative and the inclusion of the project in the BRTB regional emissions analysis, the PM_{2.5} discussed herein analysis will be updated and a final PM_{2.5} Conformity Determination will be provided for Interagency Consultation.

1. Mobile Source Air Toxics Analysis (MSATs)

The Federal Highway Administration (FHWA) *Guidance on Air Toxic Analysis in NEPA Documents*⁵ requires analysis of Mobile Source Air Toxics (MSAT) under specific conditions. The EPA has designated six prioritized MSATs, which are known or probable carcinogens or can cause chronic respiratory effects. The six prioritized MSATs are: Benzene; Acrolein;

² *Transportation Outlook 2035* (page 18) states: “This is a study to address capacity needs on MD 198 from MD 295 to MD 32 (2.66 miles). Bicycle and pedestrian access will be provided where appropriate. MD 198 is a key link to Fort Meade from points south and west. The area in and around Fort Meade will likely experience substantial growth as a result of BRAC project planning underway. Anne Arundel County will be contributing \$4.5 million for the planning phase.

Formaldehyde; 1,3-Butadiene, Acetaldehyde; and Diesel Exhaust (Diesel Exhaust Gases and Diesel Particulate Matter). Per SHA traffic analysis, the Build traffic volumes (ADT) and truck percentages are equal to the No-build traffic volumes (ADT) and truck percentages. Also, the maximum 2030 traffic volume (ADT) is 42,300 on MD 198 and 96,500 on MD 32; both of which are less than 140,000. Therefore the MD 198 project would be a “*minor widening project[s] and new interchange[s, such as those] that replace(s) a signalized intersection on a surface street*” ... “*that serves to improve operations of highway.....without adding substantial new capacity or creating a facility that is likely to meaningfully increase emissions*”⁶ and would be considered a **Project with Low Potential MSAT Effects**.

Included herein is a basic analysis of the likely MSAT emissions impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with any of the build alternatives. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information. Evaluating the environmental and health impacts from MSAT on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project. The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSAT in the context of highway projects. The tools to predict how MSAT disperse are also limited. Even if emission levels and concentrations of MSAT could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude reaching meaningful conclusions about project-specific health impacts. Research into the health impacts of MSAT is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses. The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants.

Even though reliable methods do not exist to accurately estimate the health impacts of MSAT at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSAT, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the build alternatives. For each alternative, the amount of MSAT emitted would be proportional to the annual average daily traffic (AADT), or vehicle miles traveled (VMT). Although the Build traffic volumes (ADT) and truck percentages are equal to the No-build traffic volumes (ADT) and truck percentages, the VMT within the study area estimated for the build alternatives may be slightly greater than that of the No-build, because the build

³ Criteria for identifying *projects of air quality concern* is described in 40 CFR 93.123(b)(1), as amended.

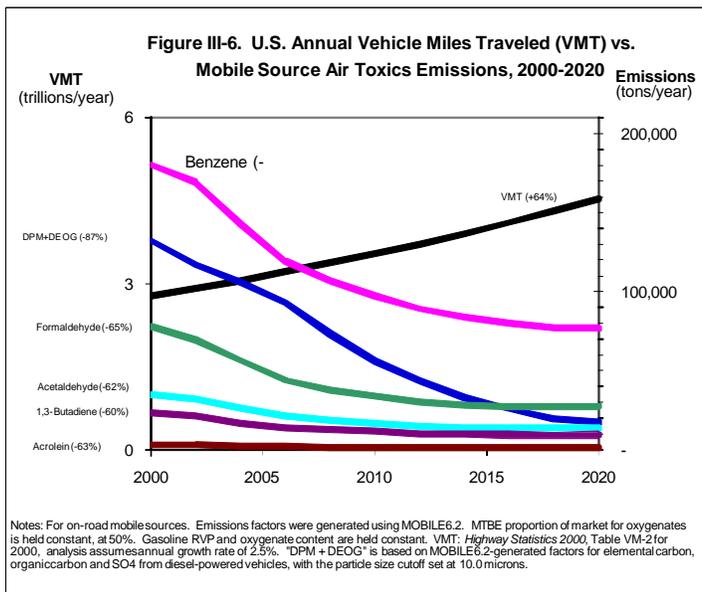
⁴ *Transportation Outlook 2035* (page 18) states: “This is a study to address capacity needs on MD 198 from MD 295 to MD 32 (2.66 miles). Bicycle and pedestrian access will be provided where appropriate. MD 198 is a key link to Fort Meade from points south and west. The area in and around Fort Meade will likely experience substantial growth as a result of BRAC project planning underway. Anne Arundel County will be contributing \$4.5 million for the planning phase.

⁵ Interim Guidance on Air Toxic Analysis in NEPA Documents

MD 198 – FROM MD 295 TO MD 32

alternatives would reduce congestion and increase efficiency of the roadway, and may attract additional trips from elsewhere in the transportation network. This slight increase in VMT may lead to slightly higher MSAT emissions along the MD 198 corridor for the build alternatives. The emissions increase due to increased VMT is offset somewhat by lower MSAT emission rates due to increased speeds, since according to EPA's MOBILE 6.2 emissions model, emissions of all of the priority MSAT, except for diesel particulate matter, decrease as speed increases. The extent to which these speed-related emissions decreases would offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models. The additional lanes would have the effect of moving some traffic closer to nearby homes and businesses; therefore, there may be localized areas where ambient concentrations of MSAT could be higher under the build alternatives than the No-build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the side where the roadways shift towards the residences and businesses. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-build alternative cannot be accurately quantified due to the inherent deficiencies of current models.

In summary, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the build alternatives could be higher relative to the No-build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT would be lower in other locations when traffic shifts away from them. Furthermore, at both the project location and regionally, MSAT concentrations would decrease in future years due to EPA's vehicle emission and fuel regulations (Figure III-6). MSAT dispersion studies have shown that air toxics from the roadway start to drop off at about 100 meters, and that by 500 meters, most studies have found it very difficult to distinguish the roadway air toxic concentrations from background air toxic concentrations in any given area. Sensitive receptors are those facilities most likely to contain large concentrations of the more sensitive population. There does not appear to be any sensitive receptors within this project area.



1. Construction Emissions

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. The SHA has addressed this possibility by establishing “Specifications for Construction and Materials” which specifies construction procedures to be followed by contractors involved in site work. The Maryland Air and Radiation Management Administration has been consulted to determine the adequacy of SHA’s specifications in terms of satisfying the requirements of the “Regulations Governing the Control of Air Pollution in the State of Maryland.” The Maryland Air and Radiation Management Administration found the specifications to be consistent with the requirements of these regulations. Therefore, during the construction period, all appropriate measures (Code of Maryland Regulations 26.11.06.03D) would be incorporated to minimize the impact of the proposed transportation improvements on the air quality of the area.

G. Noise

This project-level noise analysis has been completed in accordance with FHWA and SHA guidelines, including Title 23 of the CFR, Part 772 *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 CFR, Part 772) and the MDOT – SHA Sound Barrier Policy (April 2011). This analysis has been based on the revised federal and state regulations, which become effective July 13, 2011, concerning the Procedures for Abatement of Highway Traffic Noise and Construction Noise. Refer to the *MD 198 Noise Technical Report* (SHA, 2011) for a detailed discussion of the component portions of the noise analysis.

1. Noise Abatement Criteria and Noise Sensitive Areas

The determination of traffic noise impacts is based on the relationship between the ambient noise levels and the established noise abatement criteria (NAC) for the study area. The effects of noise are judged in accordance with the Federal Highway Administration guidelines as established by 23 Code of Federal Regulations (CFR), Part 772 and current SHA Policies. The State Highway Administration Noise Abatement Criteria provided in Table III-18 are derived from Federal criteria, which are based on specific land uses and are used in determining the need for studying noise attenuation measures. The majority of the study area evaluated in this report is Land Use Category B, however the area also includes Land Use Categories C, E, and G. FHWA guidelines require that states define their impact criteria as being at least 1 dB(A) less than the NAC. The State Highway Administration has set the noise impact levels at 1 dB(A) less than the NAC as shown in Table III-18.

For a Type I project, SHA considers a sensitive land use to be impacted if:

- The design year noise levels are projected to equal or exceed the Noise abatement criteria in Table III-18, or
- The projected noise levels are anticipated to increase over existing year noise levels by the amount shown in Table III-19 below.

Table III-18: State Highway Noise Abatement Criteria (NAC) Hourly A-Weighted Sound Level in Decibels (dBA)¹

Activity		
A	56 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (Exterior)	Residential.
C	66 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D	51 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	71 (Exterior)	Hotels, motels, offices, restaurants/ bars, and other developed lands, properties or activities not included in A-D or F.
F	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship yards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

1. Activity Categories and Description of Activity Categories are from the FHWA Noise Abatement Criteria. The Noise Abatement Criteria Noise Levels are established at one dB(A) less than the FHWA noise levels.

Table III-19: SHA Substantial Noise Increase Criteria Hourly A-Weighted Sound Level in Decibels (dBA)

Existing Noise Level	
45 dB(A) or less	15 dB(A)
46 dB(A)	14 dB(A)
47 dB(A)	13 dB(A)
48 dB(A)	12 dB(A)
49 dB(A)	11 dB(A)
50 dB(A) or greater	10 dB(A)

Noise Sensitive Areas (NSAs) can be residential or non-residential. Residential NSAs include single-family residences, single-family attached residences (townhouses), multi-family residences (condominiums and apartments), motels and hotels. Non-residential NSAs include recreation areas, playgrounds, active sports areas, parks, schools, places of worship, libraries, restaurants, bars, medical facilities, and hospitals. Country clubs and golf courses are not considered noise sensitive areas. There are six NSAs in the study area.

Noise has been measured and/or modeled at selected points throughout the study area within the NSAs and these locations are referred to as 'Receptors'. In this study, receptors have been labeled according to the following convention: 'M' receptors were measured in the field and modeled, 'R' receptors were only modeled.

2. Analysis

Worst case noise levels were predicted using Traffic Noise Model (TNM) Version 2.5 for the following conditions: Existing, 2030 No-Build, 2030 Build Alternative 2, and 2030 Build Mainline Alternative 4 Modified. Calibration is used to validate the accuracy of a particular noise model (TNM 2.5), using measured highway traffic noise levels and the concurrent highway

MD 198 – FROM MD 295 TO MD 32

traffic counts. SHA considers a TNM Model to be properly calibrated when the modeled noise levels are within \pm three dB(A) of the measured noise levels for most of the receptors. In order to bring a model into calibration, modifications such as additional terrain and structural elements can be added to the model and re-tested until the SHA calibration criteria are met.

Locations of the six NSAs determined what portions of Alternative 2 (Figures III-7A:7F) and Alternative 4 Modified (Figures III-8A:8F) were modeled. The interchange options were not modeled because they are not in the vicinity of the NSAs. To predict worst case traffic noise levels and sound barrier performance, predicted 2030 traffic volumes were used in the analysis. Both AM and PM traffic conditions were analyzed to determine which produced the loudest noise levels. The traffic condition which produced the highest noise levels for each of the receptors was used in the model.

Twenty-two measurement receptors (M-01 thru M-09 and M-11 thru M-23) were used for predicting the TNM noise levels, barrier design, and analysis. In addition, sixteen receptors (R-01 thru R-16) were added in order to establish the 66 dB(A) and 71 dB(A) contours. Table III-19 indicates the predicted noise levels for the Existing Worst Case, 2030 No-Build, 2030 Build Alternative 2, and 2030 Build Mainline Alternative 4 Modified conditions. 2030 No-Build or 2030 Build conditions for either Alternate 2 or Alternate 4 modified. See Table III-19 for the predicted noise levels.

NSA-02

The existing residences in this NSA are not impacted under the worst-case 2030 No-Build or 2030 Build Conditions for either Alternate 2 or Alternate 4 modified. See Table III-19 for the predicted noise levels. Receptor M-01 shows an impact, but was not in an area of frequent human use.

Receptor M-01 was used to assist in developing the 66 dB(A) contour.

NSA-03

Two of the ball fields in NSA-03 are impacted under Alternative 4 Modified, as the predicted noise levels equal or exceed 66dB(A). See Table III-19 for the predicted noise levels.

In addition to peak hour traffic, non-peak hour traffic (7 to 8 pm) was modeled in the PM condition to verify that impacts occurred later in the evening when the ballfields were in use. The study indicated that there was an impact at receptor M-02 during the non-peak hour.

NSA-04

Noise levels at Receptor R-02 meet the Noise Abatement Criteria (NAC) noise level of 71 dB(A) in Table III-18 for medical facilities. Receptor R-02 is located between the Patient First medical facility parking lot and MD 198. It was placed to assist in developing the 66 dB(A) contour line at the facility. The 66 dB(A) line crosses the Patient First parking lot under Alternate 2 and Alternate 4 Modified; however, the parking lot is not impacted because the parking lot is not considered to be an area of frequent human use. There are no other outdoor uses at this facility.

Table III-20: Noise Impacts for Alternatives 2 and 4 Modified

Receptor Number ¹	Land Use Type	Existing Worst Case Traffic Noise Level ²	2030 No Build Predicted Noise Level ²	Difference from Existing Worst Case to 2030 No- Build	ALTERNATIVE 2		ALTERNATIVE 4 MODIFIED	
					2030 Build Predicted Noise Level ^{2,3}	Difference from Existing Worst Case to 2030 Build ^{3,5}	2030 Build Predicted Noise Level ^{2,3}	Difference from Existing Worst Case to 2030 Build ^{3,5}
NSA -01								
M-05	Future Development / Commercial	53	53	0	53	0	58	+5
R-15	Future Development / Commercial	63	63	0	63	0	NA ⁷	----
R-16	Future Development / Commercial	58	58	0	58	0	64	+6
NSA-02								
M-01	Residential	66 ⁴	66 ⁴	0	66 ⁴	0	72	+6
M-06	Residential	53	53	0	53	0	58	+5
M-07	Residential	55	55	0	55	0	60	+5
M-08	Residential	58	58	0	58	0	62	+4
M-09	Recreation Area/ Residential	60	60	0	60	0	64	+4
NSA-03								
M-02	Recreation Area/ Institutional	65	65	0	65	0	69	+4
M-03	Recreation Area/ Institutional	61	61	0	61	0	67	+6
M-04	Recreation Area/ Institutional	52	52	0	52	0	57	+5
NSA-04								
M-11	Commercial	69 ⁴	69 ⁴	0	69 ⁴	0	70 ⁴	+1
M-12	Commercial	67 ⁴	67 ⁴	0	67 ⁴	0	67 ⁴	+0
M-13	Commercial	68 ⁴	68 ⁴	0	68 ⁴	0	69 ⁴	+1
M-14	Commercial	62	62	0	62	0	62	+0
M-15	Commercial	65	65	0	65	0	65	+0
R-01	Commercial	68 ⁴	68 ⁴	0	68 ⁴	0	68 ⁴	+0
R-02	Commercial	71	71	0	71	0	71	+0
R-03	Commercial	63	63	0	63	0	63	+0
R-04	Forest	63	63	0	63	0	63	+0
NSA-05								
M-16	Forest	64	64	0	64	0	NA ⁷	----
M-17	Forest	60	60	0	60	0	71 ⁵	+11
M-18	Industrial	67 ⁴	67 ⁴	0	67 ⁴	0	69 ⁴	+2

Table III-20: Noise Impacts for Alternatives 2 and 4 Modified

Receptor Number ¹	Land Use Type	Existing Worst Case Traffic Noise Level ²	2030 No Build Predicted Noise Level ²	Difference from Existing Worst Case to 2030 No- Build	ALTERNATIVE 2		2030 Build Predicted Noise Level ^{2,3}	Difference from Existing Worst Case to 2030 Build ^{3,5}	2030 Build Predicted Noise Level ^{2,3}	Difference from Existing Worst Case to 2030 Build
					2030 Build Predicted Noise Level ^{2,3}	Difference from Existing Worst Case to 2030 Build ^{3,5}				
R-05	Forest	61	61	0	61	0	69 ⁴	+8		
R-06	Forest	53	53	0	53	0	58	+5		
R-07	Forest	63	63	0	63	0	70 ⁴	+7		
R-08	Forest	54	54	0	54	0	60	+6		
M-19	Forest	65	65	0	65	0	73 ⁵	+8		
M-20	Commercial	64	64	0	64	0	71	+7		
M-21	Forest	65	65	0	65	0	73 ⁵	+8		
M-22	Forest	64	64	0	64	0	68 ⁴	+4		
M-23	Commercial	68 ⁴	68 ⁴	0	68 ⁴	0	68 ⁴	+0		
R-09	Forest	71	71	0	71	0	NA ⁷	--		
R-10	Forest	59	59	0	59	0	65	+6		
R-11	Forest	67 ⁴	67 ⁴	0	67 ⁴	0	NA ⁷	--		
R-12	Forest	61	61	0	61	0	66 ⁴	+5		
R-13	Forest	72	72	0	72	0	71 ⁵	- 1		
R-14	Forest	59	59	0	59	0	60	+1		

LEGEND

Impact³

1. A Receptor Number beginning with "M" represents a measured location and a Receptor Number beginning with "R" represents a modeled receptor only.

2. A noise level of 45 dB(A) was added to the TNM results in order to account for the presence of background because TNM does not account for background noise.

3. Impacted receptors are those where the predicted noise levels equal or exceed toe Criteria Noise Levels in Table 1.C. or where there is an increase over exiting noise levels as given in Table 1.D.

4. Receptors of this land use are not impacted until noise levels reach 71 dB(A).

5. Receptor is impacted, but is located on undeveloped land. Receptor was chosen in order to establish the 66 dB(A) and 71dB(A) contour lines.

6. This comparison is used in the determination of impacts.

7. Not applicable. Receptor is located in proposed roadway.

Because there is no exterior impact and the FHWA NAC criterion lists an interior noise threshold for medical facilities (Category D), a preliminary interior impact investigation was performed for NSA 4. The analysis was performed using the *FHWA Highway Traffic Noise Analysis and Abatement Guidance* dated January 2011 (page 30). Assuming masonry construction and double- glazed windows, the transmission loss through the building exterior would be 35 dB(A). Using the exterior level of 68 dB(A) at R-01 and subtracting the 35 dB(A) transmission loss yields an interior noise level of 33 dB(A). This is well below the

MD 198 – FROM MD 295 TO MD 32

interior NAC level of 51 dB(A) and therefore there are no interior impacts. Noise levels generated within the building itself would well exceed 33 dB(A).

The adjacent fast food restaurants are not impacted because impact does not occur for those facilities unless the noise level reaches 71 dB(A).

Receptors in areas of frequent human use in this NSA are not impacted under the worst-case 2030 No-Build or 2030 Build Conditions for either Alternate 2 or Alternate 4 Modified.

NSA-05

The receptors at this NSA are not impacted under the worst-case 2030 No-Build or 2030 Build conditions except at M-17 which is located on undeveloped land. M-17 was modeled in order to determine the location of the 66 dB(A) line and the 71 dB(A) line. The 66 dB(A) contour varies from 60 - 100 feet from the edge of proposed MD198 and the 71dB(A) contour varies from 20 - 40 feet from the edge of proposed MD 198.

NSA-06

Because restaurants/ bars impact occurs at 71 dB(A), neither the Southern Barbeque building (currently vacant) nor Casey's Crab Co. are impacted under the worst-case 2030 No-Build or 2030 Build conditions for either Alternate 2 or Alternate 4 modified. Southern Barbeque and Casey's Crab House are both represented by Receptor M-23.

There is an outside eating area in the vicinity of receptor M-20 at the Bank Shot Bar & Grill which is impacted under the Alternate 4 Modified 2030 Build Conditions.

Other receptors in this NSA (M-19, M-21, R-12 and R-13) were also impacted, but are on undeveloped parcels. These receptors were placed in order to determine the location of the 66 dB(A) and 71 dB(A) contours.

3. Noise Abatement

According to the SHA *Sound Barrier Policy*, decisions concerning the provision of sound barriers will be made after evaluation of the feasibility and reasonableness criteria. Sound barrier feasibility is defined as the engineering and acoustical ability to provide effective noise reduction. The determination of the feasibility of a sound barrier is dependent upon the relationship of the highway to the adjacent community. The elevations of the highway and adjacent development must be such that a barrier of reasonable height can be constructed to provide a desirable noise reduction. Other factors such as available right-of-way, constructability, and safety are also considered in determining sound barrier feasibility. Reasonableness includes such factors as cost, desires of the affected community, the relationship of existing worst-case to build noise levels, aesthetics, and environmental considerations.

a. Feasibility

The design of a sound barrier may be feasible provided the following criteria can be met:

- Noise levels can be reduced by at least 5 dB(A) at 50% of the impacted receptors in any given noise sensitive area.
- Placement of a sound barrier does not restrict vehicular or pedestrian access.
- Construction of a sound barrier does not cause any safety or maintenance

problems.

- A sound barrier can be constructed given topography, drainage, utilities, etc.
- There are no non-highway noise sources that would reduce or limit barrier effectiveness.

b. Reasonableness

A sound barrier may be considered to be reasonable when the following criteria are met:

- At least 50% of the benefitted property owners and residents are in favor of noise abatement.
- At least 50% of benefitted residences will receive a 7 dB(A) or greater noise reduction in a defined NSA.
- The noise barrier will not have adverse impacts on Section 4(f) resources.
- The square footage of noise abatement is equal to or less than 2,700 square feet per benefitted residence.

4. Summary of Results

It was determined that for Build Alternative 2 noise mitigation is not warranted for any of the six NSAs. Noise mitigation is not warranted for Build Alternative 4 Modified in NSA-01, NSA-02, NSA-04, or NSA-05 as there are no impacted areas of frequent human use. Noise mitigation is warranted at NSA 3 for Build Alternative 4 Modified though it is not feasible since it would restrict pedestrian access to the ball field. Noise mitigation is warranted at NSA-06 though it is not reasonable because 7dB(A) noise reduction cannot be obtained at the impacted receptor due to openings in the barrier required for ingress/egress at the outside eating area.

The following provides the noise analysis in NSA-03 and NSA-06 for Build Alternative 4 Modified:

NSA-03

At NSA-03, a sound barrier was investigated to determine the feasibility of providing noise abatement to the ball fields which are impacted in the design year 2030 under Alternative 4 Modified.

Two barrier options were investigated to provide abatement. Option 1 provides a continuous barrier along the proposed parking lot along the north side of the ballfields. Under this option, a door would be placed in the noise barrier to provide access from the parking lot to the ballfield rather than accessing the ballfields from the end of the barrier. While Option 2 would provide a barrier with a physical break in the barrier and an overlap between the two barrier segments in lieu of providing a door.

Although, results indicated the following regarding a sound barrier:

- It can provide 10 dB(A) reduction at the most severely impacted portions of the ball fields, namely the spectator areas for ball fields #1 and #4.
- It would be approximately 600 feet long and vary in height from 8 to 14 feet with an area of 7,553 square feet for Option 1 or approximately 670 feet long and vary in height from 8 feet to 15 feet with an area of 7,799 square feet for Option 2.
- The linear footage of the ballfields along MD 198 is approximately 630 feet. Using the SHA Linear Footage Factor of 125 feet of linear footage per one residence, the resulting

MD 198 – FROM MD 295 TO MD 32

number of equivalent residences is 5. Counting the ball fields as 5 equivalent residences, the area of noise abatement provided per benefitted residence would be either 1,511 square feet for Option 1 or 1,560 square feet for Option 2 per benefitted residence.

Noise mitigation is warranted at NSA-03; however, SHA determined that it would not be feasible to include a noise barrier at the ball fields (NSA-03) due to the access constraints that a barrier located between the parking area and the ball fields would cause. In addition, use of the fields is limited to those with permits on weekdays during approximately half the year (from April through August). Additional complications include potential negative visual impacts to a Section 4(f) resource.

NSA-06

At NSA-06, a sound barrier was investigated to determine the feasibility of providing noise abatement to the outside eating area at the Bank Shot Bar & Grill which is impacted in the design year 2030 under Alternate 4 Modified. The results indicated that a sound barrier can provide at least 5 dB(A) reduction, but cannot provide 7 dB(A) reduction due to openings in the barrier necessary for ingress/egress. The barrier would be approximately 377 feet long and vary in height from 24 to 32 feet with an area of 11,653 square feet. The linear footage of the Bank Shot Bar & Grill property along MD 198 is approximately 185 feet. Using the SHA Linear Footage Factor of 125 feet of linear footage per one residence, and rounding up, the resulting number of equivalent residences is 2. Counting the property as 2 equivalent residences, the area of noise abatement provided per benefitted residence would be 5,827 square feet per benefitted residence.

Noise mitigation is warranted at NSA-06, but is not reasonable, because 7 dB(A) noise reduction cannot be obtained at the impacted receptor due to openings in the barrier required for ingress/egress. Additional complications include potential negative visual impacts to the facility, as well as limiting access to and from the restaurant.

H. Hazardous Materials

An Initial Site Assessment was conducted for the MD 198 study area to identify locations with a likely presence of hazardous materials, wastes, or petroleum products. A summary of the assessment is below. For further information refer to the *Initial Site Assessment for MD 198: MD 32 to MD 295, Anne Arundel County, Maryland* (SHA, 2009).

There were 51 sites identified within the study area ranging in levels of severity of environmental concern. Fourteen sites received a high impact ranking based on SHA Project Impact Ranking Criteria (PIRC) requirements.

A partial investigation, due to access restrictions, was conducted at three (District Training School/ DC Children's Center, Fort George G. Meade and Tipton Airport) of the 51 sites. These sites were investigated within the area of MD 198 that would be impacted by the build alternatives and options. It is of best practice to conduct full investigations after a preferred alternative is selected; therefore, if warranted, investigations can be completed during a future stage of the project.

1. Impacts and Minimization/Mitigation

Thirty-Seven of the 51 sites, ranking from medium to high severity, would be impacted by the build alternatives and interchange options (Table III-20). A Preliminary Site Investigation

MD 198 – FROM MD 295 TO MD 32

(PSI) Screening is recommended for the 14 sites ranked as high severity in order to gather additional information regarding contamination of total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCB's), Resource Conservation and Recovery Act (RCRA) metals, volatile organic compounds (VOC's), and semi-volatile organic compounds (SVOC's). Further investigation such as soil sampling of the remaining 23 impacted sites could be required. Should soil contamination be present on site, excavation and proper removal/disposal of the material will be required.

SHA has coordinated with Fort Meade to identify probable locations of unexploded ordinances (UXOs) within the project area. Based on the information provided by Fort Meade, there are no anticipated impacts to UXOs by Alternative 2, 4 Modified, and the interchange options.

Table III-21: Sites Impacted by the Alternatives and Interchange Options

Site # (Parcel #) & Location	Risk Ranking	Impact Type	Alternative
Site 1 (Parcel # 12) is located on the south side of Laurel Fort Meade Road (MD 198) west of the MD 198/MD 32 Interchange. The parcel consists of the Tipton Airport.	High	Minimal property impacts	Interchange Options A, C, and D
Site 2 (Parcel # 71) is located on the south side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a radio tower with an emergency generator and a diesel AST.	Medium	Minimal property impacts	Alternative 4 Modified
Site 3 (Parcel # 86) is located on the south side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a wooded area.	Low	Minimal property impacts	Interchange Options A, C, and D
Site 4 (Parcel # 94) is located on the south side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a wooded area.	Low	Minimal property impacts	Alternative 4 Modified
Site 5 (Parcel # 65) is located on the north side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a gas station and auto service center.	High	Minimal property impacts	Alternative 4 Modified
Site 6 (Parcel # 64) is located on the north side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a gated house.	Medium	Minimal property impacts	Alternative 4 Modified

MD 198 – FROM MD 295 TO MD 32

Site # (Parcel #) & Location	Risk Ranking	Impact Type	Alternative
Site 7 (Parcel # 51) is located on the south side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a wooded area and an abandoned concrete structure.	Low	Minimal property impacts	Alternative 4 Modified
Site 8 (Parcel # 50) is located on the north side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a crab shop.	High	Minimal property impacts	Alternative 4 Modified
Site 9 (Parcel # 88) is located on the north side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of an auto service center.	High	Minimal property impacts	Alternative 4 Modified
Site 10 (Parcel # 58) is located on the south side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a commercial building.	Medium/High	Minimal property impacts	Alternative 4 Modified
Site 11 (Parcel # 75) is located on the north side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a restaurant.	Medium	Minimal property impacts	Alternative 4 Modified
Site 12 (Parcel # 57) is located on the north side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a wooded area.	Low	Minimal property impacts	Alternative 4 Modified
Site 13 (Parcel # 72) is located on the south side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of a wooded area.	Low	Minimal property impacts	Alternative 4 Modified
Site 14 (Parcel # 70) is located on the south side of Laurel Fort Meade Road (MD 198) east of Waters Road. The parcel consists of a wooded area.	Low	Minimal property impacts	Alternative 4 Modified
Site 15 (Parcel # 78) is located on the south side of Laurel Fort Meade Road (MD 198) west of Waters Road. The parcel consists of a wooded area.	Medium	Property impacts	Alternative 4 Modified
Site 16 (Parcel # 96) is located on the north side of Laurel Fort Meade Road (MD 198) east of Old Camp Meade Road. The parcel consists of the D.C. Children's Center.	High	Minimal property impacts	Alternatives 2 and 4 Modified

Site # (Parcel #) & Location	Risk Ranking	Impact Type	Alternative
Site 17 (Parcel # 44) is located on the south side of Laurel Fort Meade Road (MD 198) between Welch's Court and Arundel Gateway Boulevard. The parcel consists of a wooded area.	Medium	Minimal property impacts	Alternative 4 Modified
Site 18 (Parcel # 40) is located on the south side of Laurel Fort Meade Road (MD 198) between Welch's Court and Arundel Gateway Boulevard. The parcel consists of a wooded area.	Low	Minimal property impacts	Alternative 4 Modified
Site 19 (Parcel # 52) is located on the north side of Laurel Fort Meade Road (MD 198) west of Old Camp Meade Road. The parcel consists of a wooded area.	Low	Minimal property impacts	Alternatives 2 and 4 Modified
Site 20 (Parcel # 69) is located on the south side of Laurel Fort Meade Road (MD 198) between Welch's Court and Arundel Gateway Boulevard. The parcel consists of a wooded area.	Low	Minimal property impacts	Alternative 4 Modified
Site 21 (Parcel # 62) is located on the north side of Laurel Fort Meade Road (MD 198) west of Old Camp Meade Road. The parcel consists of an auto body shop and paint booth.	High	Minimal property impacts	Alternative 4 Modified
Site 22 (Parcel # 14) is located on the north side of Laurel Fort Meade Road (MD 198) west of Old Camp Meade Road. The parcel consists of a wooded lot.	Low	Minimal property impacts	Alternative 4 Modified
Site 23 (Parcel # 22) is located on the north side of Laurel Fort Meade Road (MD 198) west of Old Camp Meade Road. The parcel consists of a restaurant and bar.	Low	Minimal property impacts	Alternative 4 Modified
Site 24 (Parcel # 49) is located on the south side of Laurel Fort Meade Road (MD 198) between Welch's Court and Arundel Gateway Boulevard. The parcel consists of an auto salvage yard.	Medium	Property impacts	Alternative 4 Modified
Site 25 (Parcel # 76) is located on the north side of Laurel Fort Meade Road (MD 198) west of Old Camp Meade Road. The parcel consists of a storage facility.	Medium	Minimal property impacts	Alternative 4 Modified
Sites 26 and 27 (Parcel # 34) is located on the south side of Laurel Fort Meade Road (MD 198) east of Arundel Gateway Boulevard. The parcel consists of a barber shop	Low	Displacement	Alternative 4 Modified

Site # (Parcel #) & Location	Risk Ranking	Impact Type	Alternative
Site 28 (Parcel # 33) is located on the south side of Laurel Fort Meade Road (MD 198) west of Arundel Gateway Boulevard. The parcel consists of a wooded lot.	Low	Property impacts	Alternatives 2 and 4 Modified
Site 29 (Parcel # 83) is located on the north side of Laurel Fort Meade Road (MD 198) between the Baltimore-Washington Parkway (MD 295) and Old Camp Meade Road. The parcel consists of a commercial building.	High	Minimal property impacts	Alternative 4 Modified
Site 30 (Parcel # 89) is located on the north side of Laurel Fort Meade Road (MD 198) between the Baltimore-Washington Parkway (MD 295) and Old Camp Meade Road. The parcel consists of a wooded area.	Low	Minimal property impacts	Alternatives 2 and 4 Modified
Site 31 (Parcel # 84) is located on the north side of Laurel Fort Meade Road (MD 198) between the Baltimore-Washington Parkway (MD 295) and Old Camp Meade Road. The parcel consists of an auto service center.	High	Minimal property impacts	Alternative 4 Modified
Site 32 (Parcel # 20) is located on the south side of Laurel Fort Meade Road (MD 198) between the Baltimore-Washington Parkway (MD 295) and Arundel Gateway Boulevard. The parcel consists of an open lot.	Low	Minimal property impacts	Alternatives 2 and 4 Modified
Site 33 (Parcel # 85) is located on the south side of Laurel Fort Meade Road (MD 198) between the Baltimore-Washington Parkway (MD 295) and Arundel Gateway Boulevard. The parcel consists of a car dealership and an auto service center.	High	Minimal property impacts	Alternative 4 Modified
Site 34 (Parcel # 32) is located on the south side of Laurel Fort Meade Road (MD 198) between the Baltimore-Washington Parkway (MD 295) and Arundel Gateway Boulevard. The parcel consists of an auto body and paint shop.	High	Minimal property impacts	Alternatives 2 and 4 Modified
Site 48 (Parcel # 38) is located on the south side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and Waters Road. The parcel consists of an open lot with a radio tower.	Medium	Minimal property impacts	Alternative 4 Modified

Site # (Parcel #) & Location	Risk Ranking	Impact Type	Alternative
Site 49 (Parcel # 12) is located on the south side of Laurel Fort Meade Road (MD 198) between Bald Eagle Drive and the Little Patuxent River. The parcel consists of an auto salvage yard.	High	Minimal property impacts	Interchange Options A, C, and D
Site 50 is located on the north side of Laurel Fort Meade Road (MD 198) at the eastern end of the study area, adjacent to the MD 198/MD 32 Interchange. The parcel consists of Fort Meade.	Low	Minimal property impacts	Interchange Options A, C, and D
Site 51 is located on Laurel Fort Meade Road (MD 198) at the MD 198/MD 295 Interchange. This is a listed site of a spill on the highway resulting from an accident.	Low	Minimal property impacts	Alternative 4 Modified

I. Indirect and Cumulative Effects Analysis

An Indirect and Cumulative Effects (ICE) Analysis was conducted for the MD 198 study area in compliance with the guidelines established by SHA, the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) regulations. The following narrative is a summary of the analysis; for further information refer to the *MD 198: from MD 195 to MD 32, Anne Arundel County, Maryland, Indirect and Cumulative Effects (ICE) Analysis* (SHA, 2009).

1. ICE Analysis Objective and Scoping

The ICE analysis is required to investigate past, present, and reasonable foreseeable future actions. ICE scoping involved identifying environmental resources in the project area and ICE issues for consideration, such as data availability, geographic boundaries, and time frame analysis. Indirect and Cumulative Effects are defined below:

Indirect Effects: “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 CFR 1508.8(b))

Cumulative Impacts: “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)

a. Resources

In order to determine which environmental resources should be considered in the ICE, the resources that would be directly impacted by the possible improvements were first identified. Resources directly impacted by the project formed the basis for the resources that were

MD 198 – FROM MD 295 TO MD 32

examined in the ICE. Table III-21 summarizes the resources that were analyzed in the MD 198 ICE, and their representative sub-boundaries. These sub-boundaries were used to form the overall ICE boundary.

Table III-22: Summary of ICE Resource Impacts

Resources	Incorporation into	
Socioeconomic		
Communities/Businesses	Yes	Direct and/or Indirect Impacts
Park and Recreation Facilities	Yes	Direct and/or Indirect Impacts
Cultural		
Historic Sites	Yes	Direct and/or Indirect Impacts
Natural Environmental		
Floodplains	Yes	Direct and/or Indirect Impacts
Surface Water	Yes	Direct and/or Indirect Impacts
Wetlands	Yes	Direct and/or Indirect Impacts
Terrestrial Habitat (forests)	Yes	Direct and/or Indirect Impacts

b. Time Frame

The time from 1970 to 2030, a period of 60 years, was used to represent the ICE time frame, as there was a significant increase in population within the ICE boundary in 1970 and the MD 198 project’s design year is 2030.

Table III-22 shows historical and projected population growth trends within the ICE boundary and Anne Arundel County from 1920 to 2010. The table indicates that the population in the ICE boundary nearly doubled from 1960 to 1970 and the population in Anne Arundel County increased dramatically between 1950 and 1960.

Table III-23: Historical and Projected Populations

	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010*
ICE Boundary	11,370	16,496	24,106	50,531	73,074	131,852	169,963	214,060	247,024	N/A
District 2	6,489	8,885	13,168	24,212	14,082	32,755	39,430	51,239	67,147	N/A
District 3	4,881	7,611	10,938	26,319	58,992	99,097	130,533	162,821	179,877	N/A
Anne Arundel	43,406	55,167	68,375	117,392	206,634	297,539	370,775	427,239	489,656	532,500

Source: U.S. Census data

*Projections based on Round 7B from the Baltimore Metropolitan Council Cooperative Forecasting Committee

Choosing the ICE past time frame of 1970 was not only based on population growth (it nearly doubled from 1960 to 1970), but also on the implementation of the National Environmental Assessment & DRAFT Section 4(f) Evaluation

Environmental Policy Act (NEPA) and development of significant land use management plans. In 1969, NEPA was instituted by the Federal government. In 1997, the *Anne Arundel County General Development Plan* (GDP) was adopted, the *Odenton Small Area Plan* was adopted by Anne Arundel County in 2003, and the *Jessup/Maryland City Small Area Plan* adopted by Anne Arundel County in 2004. Another significant event that occurred in the ICE boundary includes the opening of Tipton Airport in 1999.

c. Geographic Boundary

Using the environmental resources that may be affected by direct and indirect impacts of the project as a guide (Table III-21), multiple resource boundaries were reviewed to determine appropriate ICE sub-boundaries that were joined to create a single ICE boundary in which all indirect and cumulative effects will be analyzed. Because indirect and cumulative effects are farther removed from the project alternatives than direct impacts, the geographic limits for the analysis of indirect and cumulative effects extend well beyond the MD 198 project limits. The sub-boundaries considered in establishing the ICE boundary are described below:

i. Sub-Boundary Considerations

a) Election Districts and Census Tract Block Groups

Census tract block group boundaries were identified from the United States Census Bureau 2000. The census tract block group sub-boundary was established by identifying all census tract block groups completely or partially within the MD 198 project limits which included census tract 7405, block groups 1 and 4, census tract 7406.03, block groups 1 and 3, and census tract 7411, block group 1. Census tracts block groups were used as a resource sub-boundary to represent the socioeconomic resources affected by the project. The census tract boundaries form portions of the eastern and western portions of the ICE boundary. Election District boundaries were not specifically used in the ICE boundary; however, they were used to evaluate population trends since 1920.

b) Traffic Analysis Zones and Area of Traffic Influence

A Traffic Analysis Zone (TAZ) is a special area delineated by state and/or local transportation officials used for tabulating traffic-related data especially journey-to-work and place-of-work statistics. The TAZs are used to develop the Area of Traffic Influence (ATI). The ATI represents the geographic extent to which the project will affect traffic levels on nearby roadways. The TAZ and ATI boundaries were used to represent socioeconomic resources, including communities and businesses and parks and recreational facilities. They form a majority of the entire ICE boundary.

b) Sub-watersheds

Sub-watershed boundaries were established by identifying all DNR 8-digit sub-watersheds completely or partially within the MD 198 project limits. The study area includes three sub-watershed boundaries. Sub-watersheds boundaries were used to represent natural environmental resources such as floodplains, surface water, wetlands, terrestrial (forest) habitat, and rare/threatened and endangered species affected by the project. They form the southeast portion of the ICE boundary.

c) Historic Resource Areas

MD 198 – FROM MD 295 TO MD 32

Based on preliminary data, there are five potential historic resources within the project area that may be directly impacted by the proposed improvements. The limits and boundaries of these individual resources are relatively small and fall within larger census tract block group boundaries. For that reason, cultural resource boundaries were not used to represent any portion of the overall ICE boundary.

d) County Planning Areas and Priority Funding Areas

Although the ICE boundary intersects three of Anne Arundel County's small planning areas (Jessup-Maryland City, Severn, and Odenton), the planning area boundaries were not used to define the ICE boundary. These planning area boundaries are much larger than the study area affected by the project. Also, the ICE boundary intersects the Priority Funding Area (PFA) that encompasses the study area. At the time the ICE Scoping was completed, the PFA boundary that encompasses the study area was not completely defined by the Maryland Department of Planning (MDP). Therefore, the PFA boundary was not used to define the ICE boundary.

ii. Overall ICE Boundary

The ICE involves natural environmental, socioeconomic, and cultural resources. Much of the ICE focuses upon natural environmental and socioeconomic resources, based upon the potential for direct natural, socioeconomic, and cultural impacts. Therefore, census tract block groups and the Area of Traffic Influence form much of the overall ICE boundary. Sub-watershed boundaries were used to represent impacts to natural environmental features; therefore, forming a portion of the ICE boundary (Figure III-9).

This rationale for establishment of the ICE boundary allows for assessment of indirect and cumulative effects in accordance with CEQ regulations (40 CFR 1508.7 and 1508.8 (b)). For example, the extent of the sub-watershed sub-boundary included all sub-watersheds that would experience not only direct project impacts, but also other potential indirect and cumulative effects. Similarly, the TAZ/ATI sub-boundary includes the geographical extent to which the MD 198 project would affect traffic levels on nearby roadways, and the census tracts selected for consideration in the ICE include all tracts that would be affected by the proposed alternatives.

d. Land Use Cover

In order to evaluate the potential effects of the proposed transportation alternatives, it is useful to identify the pattern, intensity, and pace of development in the area. Past, existing, and future land uses in the ICE boundary were evaluated. This comparison allowed for the observation of trends that, in conjunction with local comprehensive plans and anticipated development, assisted in predicting future land use and potential cumulative effects of the project. Land use for the ICE boundary is shown for 1973 and 2002 in Table III-23.

Table III-24: Land Use/Land Cover within the ICE Boundary, 1973 and 2002

Land Use	1973 (acres)	Percent of Total Land	2002 (acres)	Percent of Total Land	Change from 1973 to 2002 (acres)	Change from 1973 to 2002 (%)
Agriculture	2319	9%	798	3%	-1521	-66%
Barren Land	24	0%	82	0%	58	242%

MD 198 – FROM MD 295 TO MD 32

Commercial	1606	6%	1194	4%	-412	-26%
Extractive	200	1%	102	0%	-98	-49%
Forest	17895	67%	15719	59%	-2176	-12%
Industrial	74	0%	2031	8%	1957	2645%
Institutional	2,389	9%	3157	12%	768	32%
Residential	1801	7%	2881	11%	1080	60%
Transportation	0	0%	0	0%	0	0%
Urban Land	482	2%	713	3%	231	48%
Water	46	0%	90	0%	44	96%
Wetlands	10	0%	7	0%	-3	-30%
TOTAL	26,846	--	26,774	--	--	--

i. Past Land Use

The past land use is based on 1973 land use maps generated by the Maryland Department of Planning (MDP) (Figure III-10).

Based on the same 1973 land use maps, the parcels of land within the ICE boundary encompassed approximately 26,811 acres. Approximately 5,871 acres of that land were developed, which is 22 percent of the total area inside the ICE Boundary. The dominant land uses within the ICE boundary were forest (17,895 acres), institutional (2,389 acres), and agricultural (2,319 acres).

ii. Existing Land Use

Existing land use was determined through a review of 2002 land use maps generated by the Maryland Department of Planning (MDP) (Figure III-11), and supplemental field reviews of the ICE boundary. The MD 198 ICE study area is comprised of primarily forest (59 percent) and institutional lands (12 percent) with some smaller areas classified as commercial, industrial, and residential areas. Compared to 1973, the ICE boundary industrial and residential land use has increase dramatically, while the forest and agriculture land uses have decreased significantly (Table III-20).

iii. Future Land Use

Future land use is expected to be similar to existing land use in the ICE boundary. Future land use in the ICE boundary will be primarily influenced by the recommendations of the existing land use plans and zoning as identified in the *Anne Arundel County General Development Plan* (2009), the *Jessup/Maryland City Small Area Plan* (2004), the *Odenton Small Area Plan* (2004), and the *Howard County General Plan* (2000). Future land use identified by Howard and Anne Arundel Counties within the ICE boundary is depicted on **Figures III-12 and III-13**. All of the future developments proposed within the ICE boundary consist of commercial and residential developments (**Table III-24 and Figure III-13**). These developments range from less than an acre to over 300 acres in size.

Table III-25: Near Future Development

Project Name	Location	Description and Size	Status
Anne Arundel County			
Arundel Gateway Development	Fort Mead Rd, Laurel	Mixed Use (300 acres)	Conceptual site plan Approved
Jefferson @ Odenton Town Center	Lokus Rd, Odenton Tax Map 21, Parcels 497, 373, 208 and 255	Mixed Use (6.97 acres)	Site plan submitted
Grimmius Inc.	8213 Brock Bridge Rd, Laurel Near Annapolis Junction Tax Map 13, Parcel 235	Commercial (4.3 acres)	Site plan approved
Ascherl / Jaffe Property	Mayfield Rd / Telegraph Rd, Odenton Tax Map 21 Parcels 83, 84, 483, 482, and 300	Commercial (9 acres)	Site plan approved
Winward Aviation / Tipton Airfield	962 Generals Hwy, Crownsville Tax Map 30, Parcel 12	Commercial (1.3 acres)	Site plan approved
Meade Center	Annapolis Rd / Berger St., Odenton Tax Map 21, Parcels 297, 299, 315	Commercial (3 acres)	Site plan approved
Centralia Lots 24-27/ Jack of Arts Studio	Market Space St, Laurel Tax Map 13, Parcel 39	Commercial (0.5 acre)	Site plan approved
Arundel Crossing West	Blair Dr, Odenton Tax Map 21, Parcel 166	Commercial (11 acres)	Site plan approved
Boat Lifts Unlimited	Betson Ave, Odenton Tax Map 21, Parcels 96 and 20	Commercial (0.4 acre)	Site plan approved
National Business Park	Forest Ave, Jessup Tax Map 13, Parcel 71	Commercial (11.4 acres)	Site plan approved
Russet East	Laurel / Fort Mead Rd, Laurel Tax Map 20, Parcel 18	Commercial (16.9 acres)	Site plan approved
Parkside Parcel 12	Rockenbach Rd, Jessup Tax Map 13, Parcel 70	Commercial (30 acres)	Site plan approved
Robinson Property	Brock Bridge Rd, Laurel Tax Map 13, Parcel 244	Commercial (5.5 acres)	Site plan approved
Rappaport, Max & Lillian Rev	7871 Max Blobs Park Rd, Jessup Tax Map 13, Parcel 35	Residential (14.5 acres)	Minor Subdivision approved
Twenty Nine Twenty One Jessup Road	2921 Jessup Road, Jessup, Lot 1 Tax Map 13, Parcel 4	Residential (0.9 acre)	Minor Subdivision approved
Seven Oaks Parcel 21	Odenton Tax Map 21, Parcel 53	Residential (2,6 acres)	Preformal Phase approved
Seven Oaks Parcel 10	Private Rd, Odenton Tax Map 21, Parcel 516	Residential (6.6 acres)	Final Phase approved
Nevamar Corp Lt 2RA – Waiver	Telegraph Rd, Odenton Tax Map 21, Parcel 23	Residential (31.5 acres)	Preformal Phase approved
Laurel Race Track	3600 Laurel / Ft Meade Rd, Laurel Tax Map 19, Parcel 86	Residential (287 acres)	Sketch Phase approved
Bonaventure Lt 168R	Annapolis Rd, Odenton, Lot 168R Tax Map 29, Parcel 241	Residential (10 acres)	Final Phase approved
National Business Park	Sentinel Drive, Annapolis Junction Tax Map 13, Parcel 38	Residential (63 acres)	Final Phase approved
Jacobs Forest	Jacobs Rd, Severn Tax Map 21, Parcel 1	Residential (19 acres)	Final Phase approved

MD 198 – FROM MD 295 TO MD 32

Project Name	Location	Description and Size	Status
Ascherl Property, Mayfields Ave	Lokus Rd, Odenton Tax Map 21, Parcels 3, 414, 824, 838, and 380	Residential (4.5 acres)	Final Phase approved
Telegraph Commerce Center	Telegraph Road, Odenton Tax Map 21, Parcels 86 and 179	Residential (5.2 acres)	Preformal Phase approved
Kanaris 1215 LLC Property	Annapolis Rd, Odenton Tax Map 29, Parcel 34	Residential (3.9 acres)	Preformal Phase approved
Eighteen Eighty Five Lamont	1885 Lamonte Ave, Odenton Tax Map 21, Parcel 111	Residential (0.3 acre)	Preformal Phase approved
Jennifer Meadows	8376 Jacobs Road, Severn Tax Map 21, Parcel 33	Residential (5.3 acres)	Final Phase approved
Reecewood Estates	Reece Rd, Odenton, Near Camp Meade Tax Map 14, Parcel 140	Residential (10.7 acres)	Final Phase approved
Parkside Phase 2, Infrastructure	Rockenbach Rd, Jessup Tax Map 13, Parcel 70	Residential (13.5 acres)	Final Phase approved
Parkside Phase 1, Infrastructure	Rockenbach Rd, Jessup Tax Map 13, Parcel 70	Residential (17.8 acres)	Final Phase approved
Parkside Phase 3A, Parcels 1,2	Max Blobs Park Rd, Jessup Tax Map 13, Parcel 70	Residential (17.8 acres)	Final Phase approved
Parkside Phase 3B, Parcels 9,10,11	Max Blobs Park Rd, Jessup Tax Map 13, Parcel 70	Residential (5 acres)	Preformal Phase approved
Waskey Peter	Jessup Rd, Jessup Tax Map 13, Parcels 153 and 154	Residential (9.2 acres)	Final Phase approved
Rhodes / Roberts Property	Annapolis Rd, Jessup Tax Map 13, Parcels 59 and 101	Residential (25 acres)	Sketch Phase approved
National Business Park Phase 2	Brock Bridge Rd, Jessup Tax Map 13, Parcels 871, 181 and 263	Commercial (121 acres)	Final Phase approved
Alta at Town Center	Nevada Ave, Odenton Tax Map 21, Parcels 138 - 140, and 336	Residential (7 acres)	Sketch Phase approved
Walgreens Store #12559	Odenton Rd, Odenton Tax Map 21, Parcels 442, 175, 180 and 390	Commercial (2.4 acres)	Final Phase approved
Otto-Baldwin Property	Annapolis Rd, Odenton Tax Map 29, Parcels 112, 214 and 353	Mixed Use (20 acres)	Sketch Phase approved
Odenton Business Park, Lot 4	Odenton Tax Map 21, Parcel 548	Commercial (5.21 acres)	Site plan approved
Royal Farm Store #149	Odenton Tax Map 21, Parcels 475,158	Commercial	Site plan approved
National Business Park / BGE Substation	Jessup Tax Map 20, Parcels 90,192	Commercial (6.14 acres)	Site plan approved
Base Realignment and Closure (BRAC)	Fort Meade/ National Security Agency (NSA)	Not Available	Working Plan Only
Loving Property	Tax Map 14, Parcel 142, Block 23	Residential (23.2 acres)	Sketch Phase approved

MD 198 – FROM MD 295 TO MD 32

Project Name	Location	Description and Size	Status
	Howard County		
Rushing Property	South Side of Washington St, East of Baldwin St.	Residential (2 acres)	Signed Plan submitted
Savage Town Center, Phase 1&2	Dorsey Run Rd, Laurel	Residential (30 acres)	Signed Plan submitted
Jessup Ready Mix Concrete	Between Waterloo Rd & Jessup Rd, Jessup	Residential (10 acres)	Final plan approved

e. Transportation Projects

There are currently two transportation projects, MD 175 and MD 732, within the ICE boundary. MD 175 (Annapolis Road) from MD 295 to MD 170 is a traffic flow improvement project that is in the project planning phase. MD 732 (Guilford Road) is a bridge replacement project that is currently under construction.

The improvements along MD 175 from MD 295 to MD 170 are expected to impact socioeconomic, cultural and natural resources. The estimated impacts range from 92 acres of right-of-way including four residential and eight commercial displacements, up to 730 linear feet of stream, 1.34 acres of wetland, 0.01 acre of floodplain, 27.1 acres of woodland, and 2.3 acres of Section 4(f) property will be impacted.

The MD 732 (Guilford Road) bridge replacement construction project is not anticipated to impact any socioeconomic, cultural, or natural environmental resource impacts.

2. Analysis/Conclusion

Anne Arundel and Howard counties are expected to experience continued growth regardless of the improvements associated with the MD 198 project. The proposed improvements to MD 198 are consistent with the *Anne Arundel County GDP*, the *Jessup/Maryland City Small Area Plan*, and the *Howard County General Plan*. All of the currently planned developments will occur regardless of the MD 198 improvements.

This ICE Analysis examined the two sections of the MD 198 project study area, the mainline and the MD 198/MD 32 Interchange. Alternatives 2 and 4 Modified have been designed to function the same with any of the three interchange options. Alternatives 2 and 4 Modified would not change the access of MD 198 to any other roads within the study area. Alternative 4 Modified includes access improvements to existing roadways within the study area. There are three different interchange options, Option A, C, and D, for the MD 198/MD 32 Interchange. All of the interchange options provide the same access to both MD 32 and MD 198 as it currently exists today.

Based on the direct impacts associated with the build alternatives and the interchange options, all natural resources within the ICE boundary, including surface water, forest/terrestrial habitat, floodplains, and wetlands may experience direct impacts. No indirect impacts on floodplains associated with Alternative 2 are expected. The build alternatives and interchange options may also cause minor indirect impacts on communities and businesses, but only the build alternatives may cause indirect impacts on recreational facilities and historic structures in the ICE boundary.

MD 198 – FROM MD 295 TO MD 32

The build alternatives and interchange options may impose cumulative effects on all of the natural resources in the ICE boundary, including water quality, surface water, forest/terrestrial habitat, floodplains, and wetlands as a result of the MD 198 project, as well as other proposed development within the ICE boundary. Alternative 2 could impose cumulative effects on all natural resources listed above with the exception of floodplains. However, some of these impacts will be minimal because of state, local, and federal laws for avoidance, minimization and/or mitigation. Future development within the ICE boundary will stimulate the local economy, attracting more people and business, and creating more jobs. Development is expected to be concentrated in residentially, commercially, and industrially zoned areas which will decrease impacts on environmentally sensitive resources.

Alternatives 2 and 4 Modified could cause adverse cumulative effects on parks and recreational facilities due to the planned increases in development within the ICE boundary. Increased planned development and population could increase business within the ICE boundary, resulting in beneficial cumulative effects on other socioeconomic resources such as improved traffic flow and accessibility to residences and businesses. Cumulative effects on historic sites and structures are expected to be minimal within the ICE boundary as a result of current state and federal regulations.

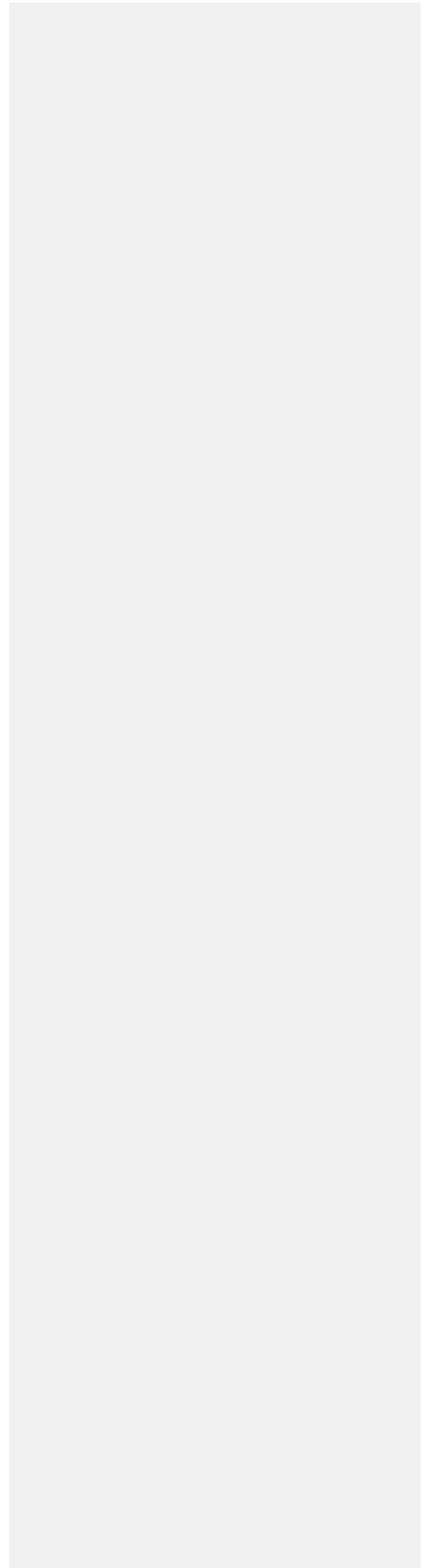
All impacts to resources resulting from the potential future development within the ICE boundary would occur independently of the improvements to MD 198 and would be minimized by existing environmental regulations. It is understood that BRAC will play a major role in determining the amount of residential and commercial development in the ICE boundary, but at this time the indirect and cumulative effects of BRAC cannot be accurately identified/quantified because the full extent of BRAC related improvements has not been fully determined within this area. It's expected that all development related to BRAC will be regulated by resource agencies and guided by the Howard County and Anne Arundel County comprehensive land use plans; thus indirect and cumulative effects associated with BRAC will be minimized.

3. ICE Mitigation

As required by SHA guidelines, avoidance and minimization strategies were incorporated into the MD 198 design to reduce impacts to environmental resources. SHA will recommend mitigation for any direct impacts that remain following avoidance and minimization efforts.

Future development and growth within the ICE boundary will be determined by state and county development plans. SHA will continue to work with local governments and state agencies to promote beneficial controls and suggest that local jurisdictions develop resource preservation plans. However, efforts to avoid, minimize, and mitigate impacts caused by cumulative development impacts within the ICE boundary are beyond the control and funding authority of SHA. Anne Arundel and Howard Counties are ultimately responsible for monitoring and applying growth management techniques that result in development at a consistent pace with roadways and other necessary infrastructure. Mitigation for cumulative effects to environmental resources must be considered by the responsible parties and regulatory agencies.

Coordination and Comments



V. COORDINATION AND COMMENTS

A. Process Coordination

1. Purpose and Need

The Purpose and Need Statement for the MD 198 Project Planning Study was presented to the agencies for review and comment in June 2007. Each agency concurred on the Purpose and Need. Table V-1 provides a list of the agency correspondence regarding the approval of the Purpose and Need Statement.

Table V-1: Purpose and Need Statement Coordination

Correspondence	To	From	Date
Concurrence on Purpose and Need	SHA	USACE	7/18/07
Concurrence on Purpose and Need	SHA	USFWS	7/16/07
Concurrence on Purpose and Need	SHA	FHWA	7/20/07
Concurrence on Purpose and Need	SHA	EPA	9/11/07
Correspondence on Purpose and Need	SHA	MDP	7/18/07
Correspondence on Purpose and Need	SHA	MHT	8/9/07
Correspondence on Purpose and Need	SHA	BMC	7/5/07
Correspondence on Purpose and Need	SHA	DNR	8/22/07
Correspondence on Purpose and Need	SHA	NMFS	8/10/07
Correspondence on Purpose and Need	SHA	MDE	11/13/07
Correspondence on Purpose and Need	SHA	NPS	2/4/08

2. Alternatives Retained for Detailed Study

The Alternatives Retained for Detailed Study (ARDS) was presented to the agencies for review and comment in August 2008. Each agency concurred with minor comments. Table V-2 provides a list of agency correspondence regarding the ARDS.

Table V-2: ARDS Coordination

Correspondence	To	From	Date
Concurrence on ARDS	SHA	FHWA	1/27/09
Concurrence on ARDS	SHA	EPA	2/6/09
Concurrence on ARDS	SHA	USACE	12/22/08
Concurrence on ARDS	SHA	USFWS	1/14/09
Concurrence on ARDS	SHA	NPS	11/21/08
Concurrence on ARDS	SHA	NMFS	12/24/08
Concurrence on ARDS	SHA	DNR	2/18/09
Concurrence on ARDS	SHA	MDE	1/22/09
Concurrence on ARDS	SHA	MHT	12/12/08
Concurrence on ARDS	SHA	MDP	12/22/08
Concurrence on ARDS	SHA	BMC	1/28/09
Concurrence on ARDS	SHA	BMC	12/30/08

The Maryland Department of Planning (MDP) indicated that the project is within the priority funding area and that it addresses the need for improving transportation access to Fort Meade to support BRAC related expansion.

The National Park Service (NPS) indicated that they would like to see Option E (Diamond Interchange with New Bridge) be retained with further study addressing road design features that reduce the security risk of a "straight connection," such as retractable hydraulic bollards, speed tables, etc. If Option E were implemented along with the removal of the existing interchange at Airfield Road/MD 198, the project would have the potential for substantial wetlands restoration and reduction in the overall impervious surface. Dismissal of Option E is justified in the ARDS package because Fort Meade objects to the direct bridge access, due to security concerns. Option D, which has the same direct access, has been re-worked through other comments received during the ARDS process to evolve into a "one-way pair" such that the new bridge moves all traffic away from Ft. Meade.

The Baltimore Metropolitan Council (BMC) noted that the Central Maryland Transit Operations Center (CMTOC) project is not discussed. The location has not been identified but has been proposed adjacent to MD 198. SHA responded by indicating that there has been coordination between the SHA MD 198 Project Planning Study representatives and representative for the CMTOC project. During these meetings, it was discussed that the location for the CMTOC along Airfield Road is one of several potential locations. If this location is selected, the preliminary design that was shared during those meetings would fit within the various interchange options, as all improvements are located off of Airfield Road, and the proposed ramp from MD 198 Eastbound to MD 32 Southbound does not widen past the existing limits.

The U.S. Fish and Wildlife Service (USFWS) feels the gravel parking area along MD 198, used during soft ball games, poses a safety hazard and would like to see the gravel lot used for upgrades to MD 198. The project now includes creating a formal parking lot at the existing gravel parking area, which can be used for the ball fields.

An informational presentation was made to the Interagency Review Meeting May 18, 2011 about a modification to the ARDS. Only minor comments were received.

The presentation discussed why Alternative 4 Modified was substituted as a build alternative in place of Alternative 4. Since the scope of the environmental impacts from the addition of an approximately 0.5 mile auxiliary lane on the mainline and an additional lane to the ramp onto MD 295 were similar to those associated with Alternative 4, additional concurrences from the agencies were needed. The presentation ended with the USACOE expressing a desire for the fall 2011 Public Hearing to be jointly sponsored.

3. Resource Agency Coordination

Table V-3 lists all of the additional agency coordination and correspondence that has occurred during the project to this point.

Table V-3: Agency Coordination

Correspondence			
Anne Arundel County Public School Inquiry	SHA	A.A. Co. Public Schools	1/29/07
Patuxent Research Refuge	SHA	FWS	3/23/07
Rare, Threatened and Endangered Species Inquiry	DNR	SHA	12/20/06
Rare, Threatened and Endangered Species Inquiry	USFWS	SHA	12/20/06
DNR response to Rare, Threatened and Endangered Species Inquiry	SHA	DNR	2/5/07
USFWS response to Rare, Threatened and Endangered Species Inquiry	SHA	USFWS	1/19/07
DNR response to Finfish Species Inquiry	SHA	DNR	12/28/06
Request to MHT for a Determination of Eligibility and/or Effects	MHT	SHA	10/16/07
Maryland Historic Trust Determination of Eligibility and/or Effects response	SHA	MHT	12/4/07
Fort Meade Preferred Option Access	SHA	Fort Meade	6/4/09
NSA Traffic Comments	SHA	NSA	6/11/09
Request to MHT for a Determination of Eligibility and/or Effects (revised for Alternative 4 Modified)	MHT	SHA	3/16/11
Request to MHT for a Determination of Eligibility and Effects (Alternative 4 Modified with and without stormwater facilities on NPS land)	SHA	MHT	05/08/14 10/09/14
Coordination regarding B/W Parkway	NPS	SHA	3/16/11
Coordination regarding B/W Parkway	SHA	NPS	4/7/11
Coordination regarding B/W Parkway	SHA	NPS	4/16/14
Coordination regarding De Minimis impact	SHA	NPS	12/2014

a. Coordination with NPS

Coordination with NPS began early in the project (2008) with their concurrence on the purpose and need and alternatives retained for detailed studies. NPS concurred that the purpose and need of the project was to improve capacity and traffic operations on MD 198, while improving vehicle and pedestrian safety and supporting development in the area. This project will address projected operational and safety deficiencies resulting from the expected construction of the Arundel Gateway development and the continued growth of Fort Meade associated with BRAC consolidation. NPS then concurred with dropping Alternatives 3 and 4 and Interchange Options B and E and proceeding with studies on Alternatives 1 (no-build), 2 (TSM) and 4 Modified and Interchange Options A, C, and D.

In 2009, SHA quantified the impacts to the Parkway from Alternatives 2 and 4, and provided those calculations and a *de minimis* request for the 0.14 – 0.38 acre of pavement at the ramp and 1-4.68 acre of temporary construction easement to the NPS. In early 2010, a meeting was held to discuss the *de minimis* impact request. At that meeting the NPS expressed concerns about the impacts to the tree buffer outside the Parkway that provided visual buffering from the adjacent retail buildings, where SHA had placed stormwater management facilities to minimize impacts to the Parkway. NPS also asked to be consulted in planning the green stormwater management facility and the landscaping design within the Parkway. Shortly thereafter, SHA coordinated with NPS about the auxiliary lane needed to carry traffic to the new development planned within the MD 198 project limits. Impacts from Alternative 4 Modified to the NPS included shifting the stormwater management facilities from the tree buffer near the toe of the ramp, and adding 0.5 acres permanent impacts and 1.3 acres temporary impacts with 2.25 acres of landscaping with native plants offered as mitigation.

NPS concurred with the assessment of impacts to the Parkway from Alternative 4 Modified April 7, 2011, saying: “NPS concurs with your determination... that the ‘character defining features of the Baltimore-Washington Parkway would not be adversely impacted by a small increase in the typical road section in this location.’ We would add that we are concerned about cumulative impacts – especially if any additional road or non-pervious surfaces are added to the overall design. We also stress that cumulative impacts be addressed in any future NEPA and Section 106/4(f) environmental documentation. NPS concurs with your determination... that ‘ESD and SWM have been minimized as greatly as possible,’ but NPS asks that any vegetation removed would be replaced on a 1:1 ratio using native species and submitted to NPS and MHT for approval in a landscape plan” (Appendix B, page B-159).

FHWA approved an Environmental Assessment and Draft Section 4(f) Evaluation on September 28, 2011. A public hearing was held November 16, 2011. No comments were received about the project design within the Parkway.

In 2014, regulatory changes in the treatment of stormwater runoff NPS’s request to preserve an acre of tree buffer between the Parkway and the adjacent commercial structures resulted in SHA revising the design within the NPS boundaries. When these changes were coordinated with NPS, the following items were discussed: a) NPS concerns with having to maintain the ESD facilities, b) safety and access of SHA to maintain the ESD facilities, c) the need for SHA to produce NEPA documents that meet NPS regulatory standards, d) the lack of a planting site since the 2011 location was no longer available, and e) the NPS preference for SHA to acquire the tree buffer area as mitigation instead. NPS staff also acknowledged their need to determine whether the 2011 concurrence with the assessment of park impacts and mitigation was binding. Subsequently the NPS Acting Superintendent spoke with the SHA Deputy Director who agreed to remove the ESD from within the Parkway. NPS agreed to support the waiver request to the Maryland Department of the Environment for an exemption to the ESD regulations.

At a fall meeting (September 15) with NPS, SHA presented the current design within the Parkway, (0.94 acre permanent impacts, 5.32 acres temporary impacts, and 2.25 acres landscaping impacts) with potential areas shown for the landscape plantings, and explained that further property research had confirmed that the buffered tree area was currently owned by the Parkway. Since then, SHA has estimated the potential treeline impacts at 0.43 acre and that NPS has agreed to work with SHA to find locations for the required landscape mitigation within a mile of the project area (within the Parkway).

4. Streamlined Process Meeting Minutes

Meetings were held with local, state, and federal agencies at critical points in the project planning process to keep involved parties informed and solicit feedback. These meetings are listed in Table V-4 and the minutes are included in Appendix B.

Table V-4: Meetings

Meeting	Topic	Date	Attendees
Scoping Meeting	Discussed the scope of the MD 198 Project Planning Project Study and obtain feedback from team members.	3/28/07	SHA, FHWA, Anne Arundel Co., Fort Meade
Interagency Review Meeting (IRM)	Provided an update on the project prior to the Alternatives Public Workshop and present alternatives and options for additional comments from agencies.	5/21/08	SHA, FHWA, MDE, MHT, USACE, MDP, DNR, NPS, M-NCPPC, ACHP, EPA, BMC, CAC
IRM	Updated agencies on Alternative 4 Modified and provide a venue for questions	5/18/11	SHA, FHWA, MDE, MHT, USACE, MDP, DNR, M-NCPPC, EPA, BMC
NPS meetings	Discussed design revisions within the Baltimore-Washington Parkway to minimize permanent impacts and to coordinate landscaping sites.	5/19/14	SHA, FHWA, NPS
		6/6/14	SHA, NPS (conference call)
		09/15/14	SHA, NPS

B. Elected Officials Correspondence

Letters were mailed to local elected officials which provided initial project planning information. Copies of these letters are located in Appendix B.

C. Public Coordination/Comments

1. Stakeholders

The project team has identified the following stakeholders for the MD 198 project:

- Fort Meade Military Reservation
- Patuxent Research Refuge
- DC Children's Center/Woodlands Job Corps Center
- Arundel Gateway
- NSA
- Greater Odenton Improvement Association
- West County Federation
- Welch's Mobile Home Community
- Tipton Airfield

MD 198 – FROM MD 295 TO MD 32

- National Park Service
- Communities of Maryland City and Russett
- Anne Arundel County

There has been ongoing coordination with the stakeholders and SHA, please refer to Appendix B for correspondence.

Outreach strategies for the MD 198 Project Planning Study are ongoing. SHA has distributed mailings that include a newsletter and a postcard informing the public of the project as well as inviting them to attend public workshops. Through comment response cards provided by newsletters and public workshops, SHA has documented the public's concerns about current congestion along MD 198, the impacts of BRAC, and the expansion of MD 198.

2. Public Workshop

An Alternatives Public Workshop was held on June 24, 2008 to present the results of the preliminary planning study to the public. SHA presented four mainline alternatives and five MD198/MD 32 interchange options at the workshop, along with information on each alternative/option, including estimated cost, right-of-way requirements, displacements, number of properties impacted, and an estimation of natural environmental impacts. A total of 87 people attended this workshop including local residents, community leaders and county representatives.

The largest number of favorable responses was for mainline Alternative 4 and interchange option E. There were no overwhelming comments received against any of the alternatives or interchange options. The following is a summary of the comments received at the June 24, 2008 Alternatives Public Workshop:

- Want improvement at ramp from 295 Northbound to 198 Westbound, especially to Corridor Market Place;
- Do not want roundabouts;
- Would like bike/walking trail;
- Requested more information on wetland and stream impacts to each alternative and option;
- Stop road construction, need alternative to cars;
- Want safe biking infrastructure that is separate from traffic;
- Would like traffic light at Welch's Court;
- Would like sound barrier and wildlife fencing at Welch's Mobile Home Community;
- Fire Department requests wide road area with sidewalks and direct access to Fort Meade;
- Minimize traffic lights;
- Reduce footprint of improvements;
- Maintain safe bike/pedestrian facilities during construction;
- Would like traffic lights that bike/pedestrian could trigger sensors;
- Concerned with bridge heights and proximity to airport: winter freezing and plane avoidance;
- Minimize wetland impacts;
- Would like sky-walks rather than cross-walks;
- Do not want off-road trails;
- Would like bicycle tunnels rather than cross-walks.

Please refer to Appendix B for all the comments received from the June 2008 Public Workshop.

3. Other Outreach

SHA met with the owner of Welch’s Mobile Home Community on December 8, 2008 to discuss the MD 198 Project Planning Study, as well as to determine whether the mobile home community qualified as an Environmental Justice (EJ) Community. The mobile home community owner agreed to distribute information to residents.

SHA conducted a meeting with the residences of Welch’s Mobile Home Park on November 17, 2009 and on November 19, 2009 with local business owners to present the MD 198 Project Planning Study. During these meetings, both access and property impacts based on the proposed alternatives were discussed, as well as the project development and the environmental document processes. SHA also discussed how a Public Hearing would be conducted in the Spring of 2010 in order to offer the public a formal opportunity to comment on the alternatives. As the project moves forward SHA will continue to coordinate with the mobile home community and the local business owners (Refer to Appendix B for detailed meeting minutes).

