

**APPENDIX D:
IMPACT ASSESSMENT METHODOLOGY AND LEVEL OF DETAIL**

**GOVERNOR HARRY W. NICE MEMORIAL BRIDGE
IMPROVEMENT PROJECT
CHARLES COUNTY, MARYLAND AND KING GEORGE COUNTY, VIRGINIA**

**DRAFT
IMPACT ASSESSMENT METHODOLOGY AND LEVEL OF DETAIL**



Maryland
Transportation
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INTRODUCTION

The Maryland Transportation Authority (Authority) is currently conducting a project planning study for the Nice Bridge Improvement Project in Charles County, Maryland and King George County, Virginia. In accordance with the Safe, Accountable, Flexible, Efficient, Transportation Equity Act - A Legacy for Users (SAFETEA-LU), the Authority has developed the following methodology for the impact assessments for each resource within the project's study area. In addition, this document includes a statement regarding the anticipated level of detail to be included in the environmental document for each resource. This information is being provided to the appropriate participating agencies for comment on the methodology and level of detail. This document will address the following resources: communities; businesses; parkland; land use; historic sites; archeological sites; soils; surface water; groundwater; floodplains; wildlife habitat; aquatic habitat; wetlands; rare, threatened and endangered species; noise quality; air quality; and hazardous materials.

IMPACT ASSESSMENT METHODOLOGIES AND LEVELS OF DETAIL

Socioeconomic Resources

The Authority will conduct a socioeconomic analysis to identify and describe the communities, neighborhoods, and facilities present within the project study area, and the underlying beneficial and adverse social, economic, and community resource impacts anticipated for each of the build alternates, including the No-Build alternate.

The Authority will quantify and/or qualify the direct effects that each alternate (including the No-Build) will have on the following, where applicable: residences and businesses; elderly, handicapped, minority, or low income individuals (Environmental Justice considerations); and community facilities (such as churches, schools, parks and recreation areas, health care facilities, libraries, community centers, government buildings, etc.).

This analysis will assess whether the project alternates will affect community or neighborhood cohesion; access to services and facilities; travel patterns (vehicular, bicycle, pedestrian); emergency vehicle response times; agricultural operations; employment opportunities; tax base and revenues. If potential low-income or minority populations are impacted by any alternate, the Authority will ensure sufficient coordination with the communities to determine if the impacts are disproportionately high or adverse.

The Authority will formally consult with public safety officials (police, fire, and emergency services) regarding the possible effects on response times as a result of implementing the alternates under consideration.

Based on the fact that US 301 is an existing highway corridor, and that the potential bridge replacement options are not expected to result in substantial realignment or property acquisition, the effects of the project on socioeconomic resources is expected to be minor. As such, the anticipated level of detail for this analysis is expected to be low.

Parkland

The Authority will identify all parks within the Nice Bridge study area and will verify the locations through coordination with the Charles County Department of Public Facilities and the King George County Parks and Recreation Department. The Authority will identify the functions and features of each park including the park owners, the types of amenities available, the types of activities available, and the funding sources for the acquisition and development of the parks. Both direct and indirect impacts to the parks will be assessed. Direct impacts will be assessed by determining where the project alternates would require the acquisition or disturbance of land within the park boundaries. The amount of land acquired and/or disturbed along with the effect that the disturbance of the land would have on the parks functions

and features will be described. Indirect impacts will be assessed by determining if noise, vibration, changes in the visual environment, and/or changes in access resulting from the roadway would affect nearby parks.

The Authority anticipates that a high level of detail will be provided for parkland impacts due to the proximity of several parks to the build alternates and the potential challenges imposed by federal regulations protecting the parks such as Section 4(f) of the U.S. Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act.

Land Use

The Authority will conduct a land use analysis to determine if the alternates under consideration will affect land use designations, and consistency with comprehensive or master plans; local and regional economic activities and development; and secondary development areas. The Authority will contact municipal, county, and regional planning offices for information on the consistency of a project with an area's planning goals and objectives.

Based on the fact that US 301 is an existing highway corridor, and that the potential bridge replacement options are not expected to result in substantial realignment or property acquisition, the effects of the project on land use is expected to be minor. As such, the predicted level of detail for this analysis is expected to be low.

Historic Sites

The project area of potential effects (APE) for historic structures will be defined to encompass all areas that will be both directly and indirectly affected by project activities. It is assumed that the APE for historic structures will consist of a corridor extending 500 feet on both sides of the existing road centerline extending south from the intersection of US 301 and Edge Hill Road in Maryland, to the intersection of US 301 and Owens Drive in Virginia. The APE will also extend approximately 1.5 miles along the Maryland and Virginia shorelines to the north and south of the bridge in order to include those properties within the viewshed to and from the bridge.

Background research will be conducted to develop a thorough understanding of the local history of the project area. The results of the background research will be presented in the form of a context statement as part of the historic resources survey and determination of eligibility report (for Maryland Historical Trust), and the evaluation report (for Virginia Department of Historic Resources). The context will be specific to the APE and will serve to place it in a regional context. This context will be used to assist in the evaluation of potential significance of historic resources within the APE.

The Authority will conduct an intensive-level survey of the project area to evaluate potential resources within the project area that have not been previously identified. Field researchers will note of areas of disturbance and/or made land, any visible ruins, and any properties that are greater than 50 years of age. Field personnel will attempt to field verify previously identified resources in the project area. This will entail a pedestrian survey (walk-over) of documented historic properties.

Determination of Eligibility/Evaluation Reports will be prepared for all identified historic resources. The reports will provide a detailed summary of the historical context of the study area, descriptions of the identified resources, and recommendations regarding National Register eligibility. These reports will assess the historic significance according to the National Register of Historic Places criteria.

If eligible historic properties are identified within the APE, the Authority will determine the effect of the proposed project on the historic resources, and will prepare a Determination of Effect Report detailing the proposed project, its location, and potential direct and indirect impacts to historic properties. If there is a finding of Adverse Effect on historic properties, then measures will need to be taken to resolve known or anticipated adverse effects. This will include the execution of a signed Memorandum of Agreement

(MOA) between The Authority and the appropriate State Historic Preservation Officer. The MOA will establish and outline the measures to be taken to minimize, avoid, or mitigate for adverse effects to historic properties.

Based on the scope of the proposed project, and the fact that the existing Nice Bridge has previously been determined eligible for the National Register, it is anticipated that historic structures will be an important factor with this project, requiring a high level of detailed study.

Archeological Sites

As determined during previous studies, the majority of the APE falls within areas of upland soils. Therefore, the bulk of the survey will be undertaken using shovel test pits (STPs) placed on a 20 meter (65.6-foot) grid. These STPs will be excavated on relatively flat (<8%) landforms with good soil drainage characteristics. In addition, STPs will also be excavated at the discretion of the field director and principal investigator within the floors of potential rock shelters and in the near vicinity of rock outcrops that potentially served as lithic sources for Native Americans. In order to better determine the distribution of artifacts associated with sites reported previously as falling within or near the existing project's APE, some number of shorter-interval STPs may be excavated within the near vicinity of the reported location of these sites. Additional STPs may also be excavated to bracket apparent isolated finds in the 20-meter grid and to better refine the boundaries of small sites identified during the course of the survey.

As noted in previous studies, the Maryland side of the APE may contain deeply buried deposits within the Potomac River terrace section of the APE. In addition, the potential for the presence of historic graves within the APE will require a wider exposure of the subsurface contact than that afforded by an STP. In order to test such contexts adequately, one-meter square test units may be needed.

All cultural material collected from the APE will be appropriately processed, inventoried, catalogued, and analyzed. The analyses will consider all potential sites within the project study limits. Prehistoric lithic artifacts will be characterized as to the cultural/temporal affiliation, type, raw material, presumed function, and evidence of modification or usewear. Prehistoric ceramics will be characterized as to their cultural affinity, type, and temper. Historic artifacts will be characterized as to their type, function, period of attribution, and diagnostic features. Analyses of the field findings will include the use of numerical techniques and qualitative assessment of the artifacts to evaluate the nature of the artifact deposits identified during testing and their depositional contexts. The goal of these analyses will be to determine the integrity of the deposits and their potential to provide new and significant information about the local and regional prehistory.

A Phase I Archeological Survey report will be prepared and will include a complete description of the exact field methodologies employed during the survey together with field results, the interpretation of those results, and any recommendation for further archeological investigations of sites identified in the APE, if necessary.

Based on the scope of the project, and the fact that the majority of the APE has previously been disturbed, impacts to archeological resources are expected to be minor. It is anticipated that a medium level of detail will be provided for this analysis.

Soils

The Build Alternates will be evaluated to determine the potential impact of the project on geology, topography and soils. Soil types and characteristics will be identified, including their erosion susceptibility, and impacts will be quantified. Digital mapping of hydric soils, soils of statewide importance and prime farmland soils, and highly erodible soils will be used to calculate the presence of these soils within a 200-foot buffer of each build alternate. To ensure consistency with the Farmland Policy Protection Act, impacts will be coordinated with the U.S. Department of Agriculture (e.g., Natural

Resource Conservation Service) via the completion of the Farmland Conversion Impact Rating Form (AD-1006 or NRCS-CPA-106), if required.

Topography will be reviewed to determine the project's impact on steep slopes within the vicinity of the alternates. Topography will be classified as slopes of 0 to 15 percent, 15 to 25 percent, and 25 percent or greater. The acreage of steep slopes within a 200-foot buffer around each build alternate will be calculated.

The Authority anticipates that a medium level of detail will be provided for soils, topography and geology impacts due to the presence of steep slopes and various soil types and associations within the vicinity of the study area.

Surface Water

Impacts to streams and rivers, including areas crossed by the perennial tributaries, will be identified by name and class. All Waters of the United States (WUS) within a 400-foot buffer (i.e., 200 feet on either side of the centerline of each build alternate) will be evaluated to determine the extent of linear feet of impact to each system. The number of stream crossings per alternate will also be determined. Time of year construction restrictions will be determined per stream classification (e.g., Class I, II, etc.). Watershed drainage areas will also be determined to evaluate surface water impacts per watershed.

Water quality effects will be assessed using existing water quality sampling data and supplemented, where needed, with limited water quality studies (physical, chemical and biological). The increase or decrease of impervious surface resulting from the build alternates will be analyzed to determine impacts on surface water quality. Sediment transport downstream will be evaluated for each alternate.

An analysis of the build alternates' effect on the Potomac River, such as the relocation or placement of piers, will be documented.

The Authority anticipates that a high level of detail will be provided for surface water impacts due to the presence of various surface water resources located within close proximity to all build alternates.

Groundwater

Groundwater flow regimes in the study area will be identified to evaluate potential impacts resulting from the build alternates. This will include assessing impacts to groundwater issues including groundwater movement, and the potential for contamination. In addition, the interaction between groundwater and existing surface water (i.e., streams) will be reviewed to assess potential effects of the build alternates on groundwater and stream hydrology. The presence of well and septic systems will be identified, if any, and evaluated to determine potential impacts to these systems by any of the build alternates.

The Authority anticipates that a low level of detail will be provided for groundwater impacts because minor impacts to groundwater are anticipated from the build alternates.

Floodplains

Impacts to Federal Emergency Management Agency (FEMA) designated 100-year floodplains will be assessed consistent with Executive Order 11988 – Floodplain Management. Acreages of the 100-year floodplain within the 400-foot buffer (i.e., 200 feet on either side of the centerline of each build alternate) will be calculated. Preliminary floodplain findings, and potential avoidance/minimization of floodplains impacts (e.g., retaining walls, 2:1 minimum slopes, etc.) will be developed.

Floodplain impacts that exceed Maryland Department of the Environment (MDE) floodplain impact criteria (e.g., greater than 0.1-foot increase in flood elevation) will be identified. Areas in which there are deviations from MDE requirements, mitigation will be required and documented.

The Authority anticipates that a high level of detail will be provided for floodplain impacts due to the presence of various floodplains located within close proximity to all build alternates, as well as challenges imposed by the floodplain regulations mentioned above.

Terrestrial Habitat and Wildlife

Impacted wooded areas, noted by community type, will be highlighted on digital mapping and acreage totals will be calculated within a 200-foot buffer of each build alternate. Any large and significant trees and the associated impacts will be documented. In addition, impacts to forest interior dwelling bird species (FIDS) habitat will be assessed. Avoidance and Minimization of these resources will be documented.

Potential direct impacts to wildlife will be assessed, including an immediate change in mammal populations, behavior, and habitat. Direct impacts to wildlife will be assessed for areas within the study area where terrestrial habitat is present.

The Authority anticipates that a low level of detail will be provided due to the proximity of the build alternates to terrestrial habitat and wildlife.

Aquatic Habitat and Biota

Impacts to Aquatic Habitat and Biota will be assessed based on existing water quality sampling data for the study area. An analysis of impacts to macroinvertebrates and fish species will be categorized per Biological Integrity ranking (FIBI and BIBI). An analysis of potential impacts to aquatic biota from increased impervious cover will also be documented.

An analysis of the build alternates' effect on aquatic habitat and biota located within the Potomac River and its associated waters will also be documented. Impact analysis will include the project alternates effect on Submerged Aquatic Vegetation (SAV) in the Potomac River. Impacts will be classified based on sparse, moderate or dense coverage, while recognizing that SAVs are not fixed resources.

The Authority anticipates that a high level of detail will be provided for aquatic habitat and biota impacts due to the presence of various aquatic resources, including the Potomac River, located within close proximity to all build alternates.

Wetlands

Impacted wetlands will be highlighted on digital mapping and acreage totals will be calculated within a 400-foot buffer (i.e., 200 feet on either side of the centerline of each build alternate). Impact analyses will be consistent with Executive Order 11990 — Protection of Wetlands. Detailed analysis of impacts will occur following the Jurisdictional Determination (JD) of wetlands present within the study area. Impacts will be classified by wetland class, per watershed, and size. Potential wetland mitigation sites and mitigation goals will also be identified.

The Authority anticipates that a high level of detail will be provided for wetland impacts due to the presence of tidal and non-tidal wetlands located within close proximity to all build alternates.

Rare, Threatened, and Endangered Species

Impacts to State and Federal Rare, Threatened and Endangered (RTE) Species will be assessed for all build alternates. Direct impacts to RTE species will be assessed in the study area where habitat is presently located. Where applicable, acreage totals will be calculated for RTE habitat. Avoidance and minimization of species habitat will also be identified.

An analysis of the build alternates' effect on bald eagle nesting locations and concentration zones will also be documented.

The Authority anticipates that a low level of detail will be provided for RTE impacts due to the minor amount of impacts anticipated from the build alternates.

Noise

The Authority will perform a technical noise analysis for each alternate carried forward into detailed study, including the No-Build Alternate. Impacts will be determined based on the relationship between the existing and predicted noise levels and established noise abatement criteria for different land uses within the project area. The Authority will identify Noise Sensitive Areas (NSA's) and locate each on the alternates mapping. A noise monitoring plan will be developed and 24-hour noise level monitoring will be completed to determine the diurnal variation in community noise levels and to establish the hour(s) of the day that produce the loudest noise levels. Short-term noise level monitoring will be conducted during worst-case noise hours. Acoustic analysis and noise prediction modeling will be completed for existing, no-build and design year scenarios using the latest FHWA Traffic Noise Model (TNM), currently version 2.5, and in accordance with 23 CFR 772. The feasibility and reasonableness of noise abatement will be evaluated for each alternate. If necessary, the Authority will develop noise abatement alternates (barriers, berms, etc.) to mitigate project impacts and develop estimated costs of each alternate using TNM noise barrier/berm analysis.

The Authority anticipates that a medium level of detail will be provided for noise because there are few noise sensitive land uses located within close proximity of the proposed improvements.

Air Quality

The Authority will assess all air quality impacts within the Nice Bridge study area based on federal and state guidance. Any impacts to air quality and the associated effects on the study area will be described.

Mobile Source Air Toxics (MSATs)

FHWA *Guidance on Air Toxic Analysis in NEPA Documents*,¹ requires analysis of Mobile Source Air Toxics (MSAT) under specific conditions. The EPA has designated six prioritized MSATs that are known or probable carcinogens or can cause chronic respiratory effects. The six prioritized MSATs are: Benzene; Acrolein; Formaldehyde; 1,3-Butadiene, Acetaldehyde; and Diesel Exhaust (Diesel Exhaust Gases and Diesel Particulate Matter). Since the no-build total projected daily traffic volume for an average summer weekend day at the Nice Bridge is approximately 42,000, this project would be considered a **Project with Low Potential MSAT Effects**. Therefore, a qualitative MSAT analysis is required in conformance with the reference guidance.

This qualitative assessment will compare, in narrative form, the expected effect of the project on traffic volumes, vehicle mix, or routing of traffic, and the associated changes in MSATs for the project alternates, based on VMT, vehicle mix, and speed. It will also discuss national trend data projecting substantial overall reductions in emissions due to stricter engine and fuel regulations issued by the U.S. Environmental Protection Agency (US EPA).

Fine Particulate Matter (PM_{2.5})

A portion of the Nice Bridge study area is located in Charles County, Maryland which is in the Washington, DC-MD-VA PM_{2.5} Nonattainment Area, which was designated a nonattainment for PM_{2.5} on January 5, 2005 by the US EPA. This designation became effective on April 5, 2005, 90 days after EPA's

¹ Interim Guidance on Air Toxic Analysis in NEPA Documents; FHWA; August 3, 2006

published action in the Federal Register. Transportation conformity for the PM_{2.5} standards applied on April 5, 2006, after the one-year grace period provided by the Clean Air Act.

Projects that require hotspot analysis for PM_{2.5} are those projects that are Projects of Air Quality Concern as enumerated in 40CFR93.123 (b)(1):

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

Because the no-build total projected daily traffic volume for an average summer weekend day at the Nice Bridge is approximately 42,000, there will not be a significant number or significant increase in diesel trucks. Therefore, it is anticipated that the requirements of the Clean Air Act and 40 CFR 93.109 will be met for particulate matter without a project-level hot-spot analysis, since the project will not be found to be a **project of air quality concern** as defined under 40 CFR 93.123(b)(1).

Ozone (O₃)

Ozone is a regional pollutant that will be analyzed on a regional basis by the Metropolitan Washington Council of Governments (MWCOG). Results of the MWCOG analysis will be documented.

CO

Carbon Monoxide (CO) impacts will be analyzed as the accepted indicator of overall vehicle-generated air pollution. The analysis years will be the year the project is open to traffic and the design year. Emissions factors, developed from the MOBILE 6.2.03 program, be used by the CAL3QHC dispersion model to predict CO concentrations at air quality sensitive receptors. The sensitive receptor locations will be defined as locations on either side of the proposed alignments that would be affected by changes in air quality. The locations selected will be residences, schools, parks, places of worship, or along the edge of right-of-way. The CO air quality analysis will consider the vicinity of a particular alternate, and therefore, No-Action and Build air quality models will be developed and analyzed separately for each build alternate. Modeled 1-hour and 8-hour average CO concentrations will be added to background CO concentrations for comparison to the State and National Ambient Air Quality Standards (S/NAAQs).

The Authority anticipates that a high level of detail will be provided for air quality impacts.

Hazardous Materials

Results of previous hazardous materials surveys indicate one area of high potential for hazardous materials and additional testing is recommended. Other areas of high to medium potential for the presence of hazardous materials do not appear likely to be impacted and no further testing is recommended at this time. Based on these findings, the Authority will perform a Preliminary Environmental Site Assessment (ESA) and related survey support services for the Naval Support Facility Dahlgren (Dahlgren).

The Authority will request and conduct a file review under the Freedom of Information Act for US EPA and Virginia Department of Environmental Quality (VDEQ) files pertaining to the prior investigations and/or remediation actions at Dahlgren. The areas adjacent to the proposed bridge project will be targeted for the review. An assessment will be made regarding the appropriateness of additional sampling if an alternate involves property acquisition of portions of Dahlgren.

The Authority will conduct soil sampling within US 301 right-of-way adjacent to Dahlgren along the length of the proposed construction activities for the bridge replacement and the roadway work. Sampling of the right-of-way is proposed based off the assumption that construction work will not extend onto the base property. This sampling approach will target the immediate area of concern and provide the Authority with a baseline of contamination levels that would be encountered during construction activities. It is anticipated that the soil samples will be collected by means of mechanical borings (GeoProbe or similar method).

Soil borings will be advanced to a depth of 15 feet at 100 foot intervals for a length of 2,700 feet. This distance covers the area between the Potomac River and Barnesfield Road (approximate project limits). A photo-ionization detector (PID) instrument (or similar instrument) will be used to field screen samples. The PID detects volatile concentrations in parts per million relative to a background level. The PID is a qualitative instrument and cannot identify specific compounds present or provide absolute concentration values. However, scanning the soils with the PID will assist in identifying the presence of any photo-ionizable volatile organic vapor concentrations and likely sample locations.

Soil samples will be collected and preserved in accordance with appropriate ASTM protocol and delivered to an US EPA/MDE/VDEQ approved analytical laboratory for testing analysis. Soil samples will be collected based on PID readings, visual, and olfactory observations. The samples will be collected at approximately 4 feet and 15 feet depths (or 6 inches above the water table if shallower than 15 feet), and will be analyzed for priority pollutant metals, mercury, PCBs, and pesticides.

Based on the fact that the potential bridge replacement options will not result in substantial realignment or property acquisition, the likelihood that the project would encounter significant quantities of hazardous materials is moderate. As such, the predicted level of detail for this analysis is expected to be medium.