

7.2 Natural Environment/Environmental Planning

Executive Summary/Key Points

- The Environmental Consultation and Mitigation Plan establishes:
 - A process for consultation with environmental resource agencies to obtain data to conduct a system-wide review of potential environmental impacts. The data obtained was used to prepare four environmental factors maps to use in the analysis.
 - A plan for analysis and mitigation, enabling the MPO to adjust project alignments to avoid or mitigate impacts to natural resources and to make informed decisions when setting project priorities for the urban area.

Map and Table References

Maps

Winston-Salem Urban Area MTP Projects and Environmental Factors Maps:

Hydrology
Land Management and Wildlife
Cultural
Agricultural

Table

Table 7.2 Potential Environmental Impacts and Mitigation Measures

7.2 Natural Environment/Environmental Planning

Development of the Metropolitan Transportation Plan (MTP) allows the Metropolitan Planning Organization (MPO) the opportunity to consult with environmental agencies and conduct a system-wide review of potential environmental impacts. The MTP consultation process is an initial step in identifying impacted areas and adjusting project alignments to avoid or minimize impacts to natural resources. It also allows the MPO to make informed decisions when setting project priorities for the urban area. The result is a transportation plan that not only minimizes negative impacts on the natural environment, but one that is ultimately more efficient, timely, and cost-effective.

Federal regulations require that:

The MPO shall consult, as appropriate, with State and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation concerning the development of the transportation plan. The consultation shall involve, as appropriate, (1) a comparison of transportation plans with State conservation plans or maps, if available; or (2) a comparison of transportation plans to inventories of natural or historic resources, if available (23 CFR 450.322).

The purpose of this consultation and mitigation plan is not only to meet the intent of the federal requirement, but to plan for a transportation system that protects and enhances the environment and the quality of life in our community.

7.2.1 Environmental Consultation Process

The Winston-Salem Urban Area MPO encourages the participation of the resource agencies throughout the development of the MTP. The consultation process for this MTP builds upon the

consultation process started in 2007 for development of the 2035 LRTP adopted in 2009. Unless otherwise outlined, the consultation process will be as follows:

- During the development of the MTP, resource agencies listed on the Resource Agency Contact List (**Appendix 7.2 A** of this chapter) will be contacted to provide input during the following plan milestones:
 - Development of tools and data needed
 - Development of base year and future year data
 - Development of draft plan
 - Adoption of final plan

Note: Every agency will not be contacted for every milestone, but at the milestones where agency input will be significant.
- The Winston-Salem Area Urea MPO will compare the proposed transportation plan to available maps, inventories, plans, policies and strategies as provided by the agency contacts. The MPO will provide the resource agencies with an opportunity for review and comment prior to decision points that might rely upon said data.
- The Winston-Salem Area Urea MPO will provide the resource agencies with an outline or schedule for the development of the MTP.
- The Winston-Salem Area Urea MPO will use email, the MPO website, the US Postal Service, telephone, private face-to-face and/or public meetings to ensure that our process is accessible to resource agencies.
- The Winston-Salem Area Urea MPO will provide written or email notice to the resource agencies of upcoming public review meetings or public comment periods being held on the draft MTP and air quality conformity process (if applicable).
- Documentation of resource agency contacts and any comments received by the MPO will be included in **Appendix 7.2 B** of this chapter. A summary of comments received and the changes made to the MTP and/or the analysis and mapping as a result of the resource agency comments is included below in this chapter under the heading “Summary of Resource Agency Comments.”

Resource Agency Contact List

A Resource Agency Contact List was first compiled with assistance from the Federal Highway Administration (FHWA) and the Piedmont Authority for Regional Transportation (PART) in 2007 for development of LRTP adopted in 2009. The list was updated and extended by Winston-Salem Urban MPO in 2012 and 2013 for the 2035 LRTP Update and again in 2015 for this 2040 MTP. The updated **Resources Agency Contact List** is included as **Appendix 7.2 A** of this chapter.

Consultations for 2040 Plan Development

Environmental resource agencies marked with one asterisk (*) on the Resource Agency Contact List were contacted via email in June 2015 to confirm or correct contact information and to request updates in data for mapping and analysis. The email also included a generalized schedule for completion of the draft 2040 plan. A sample email, along with summary of the responses with information about data and mapping sources is included in **Appendix 7.2 B, Consultation with Resources Agencies**. Based on the responses from the resources agencies, the contact list was updated and new data sources or links were identified to use to complete the environmental analysis and mapping for the environmental analysis of this 2040 plan.

Resource agencies were contacted again in July 2015 [marked with a pound sign (#)] when the environmental mapping and the draft plan was complete and asked to review and provide comments on the draft plan, particularly the Environmental Mapping discussed in this chapter. The comments received from resources agencies and Winston-Salem MPO staff responses are included in **Appendix 7.2 B** of this chapter.

Ongoing Consultation Efforts

To integrate transportation planning with other community priorities, the Winston-Salem MPO has developed strong ongoing relationships with agencies responsible for land use planning, historic resource protection and air quality monitoring and permitting.

Land Use Planning

The Winston-Salem Urban Area MPO has sought to integrate land use planning and transportation planning on an ongoing basis. The goals and objective of the 2040 MTP are based on those of the adopted land use plans of jurisdictions in the MPO, particularly the *Legacy 2030 Update*, the comprehensive plan adopted by Forsyth County and all its municipalities, including Winston-Salem. MPO staff contributed to the development of the *Legacy 2030 Update* and participated in the public involvement meetings for the plan. The MPO maintains a continuous consultation with land use planning organizations in the MPO area, as the planning directors for Winston-Salem and each of the counties in the MPO (Forsyth, Davie, Davidson, and Stokes) serve as members of the MPO's Technical Coordinating Committee (TCC). In addition, representatives from the Winston-Salem and NC Departments of Transportation have a formal role in Winston-Salem/Forsyth County's development review process by serving on the development and site plan review committees.



Historic Preservation

In addition to consulting with the NC State Historic Preservation Office, the Winston-Salem MPO has developed an ongoing relationship with the Forsyth County Historic Resources Commission (HRC). In 2009, the MPO provided funding to the HRC to assist with the Forsyth County Architectural Survey Update Project which updated a 1981 survey, compiled information from surveys done since 1981 (primarily as part of transportation projects) and identified additional historic properties. All information was compiled into a database with digital photography and GPS coordinates, providing a GIS data layer of all inventoried properties.



Forsyth County
Historic Resources
Commission

Air Quality

To fully integrate air quality impact analysis into the transportation process, the Winston-Salem Urban Area MPO has developed an ongoing consultation relationship with the Forsyth County Office of Environmental Assistance and Protection (FCOEAP), previously known as the Forsyth County Environmental Affairs Department (FCEAD). FCOEAP is the agency responsible for air quality monitoring and permitting in Forsyth County. The Director of FCOEAP's Air Quality Program serves as a member of the TCC of the MPO. FCOEAP air quality staff provides a report for each TCC and TAC meeting informing the committees on air quality issues and local air quality performance. In the past, the MPO contracted with FCOEAP to complete the Air Quality Conformity Analysis for the MTP and the TIP Needs Priority List. Currently, the FCOEAP completes the air quality analysis for CMAQ grant proposals. A summary of the history of air quality in the Winston-Salem Urban Area provided by the FCOEAP is included in **Appendix 7.2 C, Air Quality History** of this chapter.



Resource Agency Comments

As discussed above, the Winston-Salem MPO consulted with resource agencies at various points in the MTP development process. Documentation of these consultations is included in **Appendix 7.2 B**. In June 2015, the MPO undertook a preliminary consultation, requesting updated contact information and data sources from resource agencies for this 2040 Plan. Most comments received were updates of contact persons. Some resource agencies provided updated data sources which were incorporated into the environmental factors maps for this 2040 Plan. Due to the increase in data layers, the Natural Features Environmental Factors Map was divided into two maps—a hydrology map and a land management & wildlife map, increasing the number of environmental factors maps from three to four.

The environmental resource agencies were contacted again in July 2015 when updated environmental mapping and a draft plan were available. The consultations and responses are documented in **Appendix 7.2 B**. Land use, transportation and development agencies included on the Resource Agency Contact List were also be contacted in July 2015 and asked for comments during the public comment period which ran from July 16 to August 20, 2015. The most detailed comments came from the USEPA Region 4 NEPA Program Office/NC Field Office and the North Carolina Wildlife Resources Commission. Based on their comments, the mitigation measures in Table 7.2 were extensively updated.

7.2.2 Environmental Analysis and Mitigation Plan

General

Assessment of the impacts of specific transportation projects on communities and the natural environment has long been an element of project development, environmental documentation, and facility design. Federal law also includes requirements for planning-level environmental review.

Accordingly, this section discusses the MPO's generalized analysis of potential environmental impacts and identifies potential mitigation strategies to restore or maintain environmental functions affected by projects. It also summarizes the MPO's consultation with federal and state environmental regulatory agencies relative to the plans, inventories, policies, and concerns.

A preliminary environmental impact screening can identify potentially serious impacts that could end up stopping a project. Recognizing such issues at the earliest stage of planning provides the opportunity to avoid or mitigate undesirable impacts through modification or elimination of the project. Early "fatal flaw" analysis of this type helps reduce the possibility that subsequent, more detailed analyses will uncover unexpectedly serious environmental impacts. This approach helps reduce the risks that are inherent in an uncertain planning process, and helps ensure that time and resources are not expended unnecessarily.

A systems-level environmental screening allows consideration of the interactions between various projects. Rarely does a project stand independent of other projects. The combined impacts of several projects can vary substantially from the sum of each project's individual impacts. Similarly, modification or elimination of one project due to environmental considerations can significantly alter the performance and impacts of other projects. It is important to be able to assess project impacts in the context of the entire MTP.

Although system-level environmental screening does not substitute for detailed, project-specific review, this assessment can identify and highlight issues requiring further analysis. This knowledge not only reduces the likelihood of unexpected environmental impacts; it allows future environmental studies to focus on critical issues. The result is a transportation plan that not only minimizes negative impacts on the natural and man made environments, but one that is ultimately more efficient, timely, and cost-effective.

This environmental screening process and its results reflect the reality that the overwhelming majority of the recommended MTP's environmental impacts are associated with roadway projects. Once a few critical decisions are made, constraints on roadway cross sections and alignments (due to safety factors and design criteria) limit opportunities to avoid or reduce these negative impacts.

Sidewalks and bicycle facilities are much more limited in the magnitude of their environmental and community impacts, due to smaller cross-sections and greater flexibility in design. Furthermore, pedestrian and bicycle facilities are most often built in conjunction with roadway facilities, and have only marginal environmental impacts beyond those of the roadway itself. Bicycle and pedestrian travel is also inherently less disruptive to the environment than travel by automobile, especially with respect to air pollution, noise, and energy consumption.

Most of the transit elements in the MTP are associated with bus route and service expansions, which typically involve no new construction, and have minimal negative impacts on either natural or man-made environments. In general, transit impacts tend to be positive, in that increased service tends to reduce vehicle-miles traveled and typically improves accessibility in disadvantaged neighborhoods. It is difficult to identify environmental impacts for these facilities in the context of this MTP update. Specific studies are needed to assess the impacts of these transit systems.

Environmental Screening Analysis

A generalized screening was performed to assess the potential environmental impacts of the roadway projects recommended for inclusion in the Winston-Salem Urban Area 2040 MTP.

To identify environmentally sensitive areas/features for analysis, the Winston-Salem Urban Area MPO used existing GIS data and consulted with resource agencies for their recommendations of additional data sets to use for analysis. The data used for this preliminary screening analysis was obtained through various sources including (but not limited to) local government databases (Winston-Salem and Forsyth County), NCOneMap's website, the North Carolina Floodplain Mapping Program, the National Hydrography Dataset, the NC Wildlife Commission's Green Growth Toolbox data set, and resource agency websites. Sources are listed on the Resource Agency Contact List in **Appendix 7.2 A** of this chapter.

The analysis consisted of overlaying project alignments and locations onto maps depicting sensitive natural, cultural and agricultural resources. Because of the extent and diversity of data available, four separate environmental factors maps have been prepared for the 2040 Plan: hydrology; land management and wildlife; cultural; and agricultural. These maps are located at the end of this Section 7.2. The previous long range transportation plan, the 2035 Plan, had only three environmental factors maps (Natural, Cultural and Agricultural); however, due to the increase in data layers recommended by resource agencies, the natural features map was divided into two maps—a hydrology map and a land management & wildlife map.

The following environmental factors were included on the maps and in the analysis:

Hydrology Factors Map

- Rivers & Streams
- Lakes & Ponds
- 303(d) Listed Streams
- Floodplains
- Wetlands (National Wetlands Inventory)
- State-mandated Regulated Water Supply Watersheds
- EEP Targeted Watersheds
- Jordan Riparian Buffers
- Randleman Riparian Buffers

Agricultural Factors Map

- Agricultural Soils Assessment Levels
- Voluntary Agriculture District
- Farmland Preservation Properties

Land Management & Wildlife Factors Map

- Hazardous Waste Sites
- Active Permitted Landfills
- Land Trust Conservation Properties
- Land Managed for Conservation & Open Space
- Conservation Tax Credit Properties
- Natural Heritage Program Areas and Element Occurrences
- Relative Conservation Value (based on biodiversity and habitat assessment)

Cultural Factors Map

- National Register Listed, Eligible and Study Districts
- Schools & Parks

MPO staff reviewed each proposed MTP project and determined whether a significant environmental impact was anticipated based on the mapped information. Projects determined likely to have significant impacts were identified with an "E" in the "Other Significant Factors" column of the Street and Highway Project lists by horizon year (2013, 2021, 2030, and 2040) in Chapter 3.

Since this was a system-wide, planning-level screening, no formal field investigation was conducted, and screening was performed only on those features for which GIS coverage was available. The screening process allows early identification of impacts and areas of uncertainty that will need to be investigated more as a particular project moves forward through detailed planning and design. For some of the projects in the MTP, environmental studies based on federal guidelines are already underway or completed. When a project is ready to move from the MTP into the design/engineering phases, the project sponsor will conduct any necessary analysis as required by State and federal regulations.

Environmental Mitigation

General

Since the transportation planning activities of the MPO are regional in scope, this environmental mitigation discussion does not focus on each individual project within the Long Range Transportation Plan but rather offers a summary of environmentally mitigation strategies that could be considered in an effort to minimize any negative affect that a project may have on an environmentally sensitive area.

Specifically, federal regulations instruct state DOTs and MPOs to include in their long range transportation plans (MTP) and transportation improvement programs (TIP) the following:

a discussion of the environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the metropolitan transportation plan. The discussion shall be developed in consultation with federal, state and tribal land management, wildlife and regulatory agencies.

In order to meet these requirements, it is essential to know how federal regulations actually define mitigation:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
 - Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
 - Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
 - Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
 - Compensating for the impact by replacing or providing substitute resources or environments.
- (Source: 40 CFR 1508.20)

An ordered approach to mitigation, known as “sequencing,” involves understanding the affected environment and assessing transportation effects throughout project development. Effective mitigation starts at the beginning of the environmental process, not at the end. Mitigation must be included as an integral part of the alternatives development and analysis process.

SEQUENCING:

AVOID ► MINIMIZE ► REPAIR/RESTORE ► REDUCE OVER TIME ► COMPENSATE

FHWA’s mitigation policy states: Measures necessary to mitigate adverse impacts will be incorporated into the action and are eligible for Federal funding when the Administration determines that:

- The impacts for which mitigation is proposed actually result from the Administration action; and
- The proposed mitigation represents a reasonable public expenditure after considering the impacts of the action and the benefits of the proposed mitigation measures. In making this determination, the Administration will consider, among other factors, the extent to which the proposed measures will assist in the compliance with a Federal statute, Executive Order, or Administration regulation or policy. (Source: 23 CFR 771.105(d))

Mitigation Strategy & Measures

The Winston-Salem Area MPO is committed to minimizing and mitigating the negative affects of transportation projects on the natural and built environments in order to preserve our quality of life. In doing so, the MPO recognizes that not every project will require the same type or level of mitigation.

Some projects, such as new roadways and roadway widening, involve major construction with considerable earth disturbance. Others, like intersection improvements, street lighting, and resurfacing projects, involve minor construction and minimal, if any, earth disturbance. The mitigation efforts used for a project will be based upon how severe the impact on environmentally sensitive areas is expected to be.

The following three-step process is used to determine the type of mitigation strategy to apply for any given project:

1. Identify and confirm environmentally sensitive areas throughout the project study area.
2. Determine how and to what extent the project will impact these environmentally sensitive areas.
3. Develop and review appropriate mitigation strategies to lessen the impact these projects have on the environmentally sensitive areas.

The three-step mitigation planning process is designed to solicit public input and offer alternative designs or alignments and mitigation strategies for comment by the environmental review agencies, MPO, and local governments. To the extent possible, transportation projects should minimize off-site disturbance in sensitive areas, develop strategies to preserve air and water quality, limit tree removal, minimize grading and other earth disturbance, provide erosion and sediment control, and limit noise and vibration. Where feasible, alternative designs or alignments are developed that would lessen the project's impact on environmentally sensitive areas. For major construction projects, such as new roadways, or for projects that may have a region-wide environmental impact, a context sensitive solution process with considerable public participation and alternative design solutions should be used to lessen the impact of the project.

The table below details mitigation activities and measures that should be considered when dealing with environmental impacts during the project development phase. Some of the mitigation measures listed are added based on consultation with resources agencies.

Table 7.2 Potential Environmental Impacts and Mitigation Measures

Impacts	Avoidance/Minimization/Mitigation Measures
Air Quality	Designate pedestrian/Transit Oriented Development areas Adopt local air quality mitigation fee program Develop energy efficient incentive programs Adopt air quality enhancing design guidelines
Archaeological	Design modifications to avoid area Archaeological excavation Educational activities
Community Impacts	Bridge community Sidewalks Bike lanes Develop recreational areas Traffic calming Oral history project
Environmental Justice Communities	Property owners paid fair market value for property acquired Residential and commercial relocation
Farmland	Protect one to one farmland acre for every acre converted Agricultural conservation easement on farmland Compensation
Fragmented Animal Habitats	Wildlife crossing structures, including overpasses or underpasses, that facilitate movement of terrestrial and aquatic species through the landscape Other innovative wildlife crossings and design measures Native plant species to provide habitat for native insects and animal species; control of invasive species infestations Regional and county-wide conservation plans Adoption of zoning, ordinances, and development standards that protect connected natural areas
Historic Sites	Relocation of historic property Design modification Landscaping to reduce visual impacts Photo documentation Historic archival recording to present information to the public
Light Impacts	Lens color Direction of lighting Low level lighting Use of lighting that illuminates roadways while protected natural nighttime environment for humans and wildlife
Noise	Depressed roads Noise barriers Planting trees Construct tunnels
Park Impacts	Construct bike/pedestrian pathways Dedicate land Compensation for park dedication fees Replace impaired functions
Streams	Crossing minimization Stream restoration Vegetative/forested buffer zones—undisturbed and forested along perennial streams; vegetated along intermittent streams. Native plant species in riparian areas to provide habitat for native insects and animal species; control of invasive species infestations. Strict erosion and sedimentation control measures Best management practices for stormwater management, particularly with potential impact

Impacts	Avoidance/Minimization/Mitigation Measures
	on 303(d) listed waters Ecosystem Enhancement Program (EEP) Impervious surface limits Low impact development Alternatives to curb and gutter streets
Threatened & Endangered Species	Preservation, enhancement or restoration of degraded habitat Creation of new habitats Establishment of vegetated buffer areas around existing habitats and streams Modifications of land use practices Restrictions on land access Regional and county-wide conservation plans Protected corridors to facilitate movement of species across the landscape Best management practices for habitat protection Incentives to protect habitat in developing landscapes
Viewshed Impacts	Vegetation and landscaping Screening Buffers Earthen berms Camouflage Lighting limitations
Wetlands	Vegetated/forested buffers around wetlands "Critical habitat zones" around wetlands Wetland restoration Creation of new wetlands Strict erosion and sedimentation control measures Use silt fencing and other methods to keep wildlife out of active construction areas. Native plant species to provide habitat for native insects and animal species; control of invasive species infestations. Ecosystem Enhancement Program (EEP) Compensation

Appendix References

Documents

- Appendix 7.2 - A Resource Agency Contact List
- Appendix 7.2 - B Documentation of Consultation with Resource Agencies
- Appendix 7.2 - C Air Quality History