

I-39/90/94 STUDY

General Impact Analysis Methodology Report

I-39/90/94

Madison – Portage

US 12/18 Interchange – I-90/94

Dane & Columbia Counties



Wisconsin Department of Transportation
Southwest Region
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Table of Contents

Table of Contents
Revision History

	Page
Section 1	1
1.0 Introduction.....	1
1.1 Purpose of Impact Analysis Methodology	1
Section 2	2
2.0 Agricultural Impact Methodology.....	2
2.1 Laws, Regulations, and Guidelines.....	2
2.2 General Methodology	2
Section 3	3
3.0 Upland Habitat / Wildlife Impact Methodology	3
3.1 Laws, Regulations, and Guidelines.....	3
3.2 General Methodology	3
Section 4	4
4.0 Threatened and Endangered Species Impact Methodology.....	4
4.1 Laws, Regulations, and Guidelines.....	4
4.2 General Methodology	4
Section 5	5
5.0 Water Resource and Floodplain Impact Methodology	5
5.1 Laws, Regulations, and Guidelines.....	5
5.2 General Methodology	5
Section 6	6
6.0 Wetland Impact Methodology.....	6
6.1 Laws, Regulations, and Guidelines.....	6
6.2 General Methodology	6
Section 7	8
7.0 Air Quality Impact Methodology	8
7.1 Laws, Regulations, and Guidelines.....	8
7.2 General Methodology	8
Section 8	10
8.0 Traffic Noise Impact Methodology.....	10
8.1 Laws, Regulations, and Guidelines.....	10
8.2 General Methodology	10
Section 9	11
9.0 Construction Impact Methodology.....	11
9.1 Laws, Regulations, and Guidelines.....	11
9.2 General Methodology	11
Section 10	12

Table of Contents (continued)

10.0	Visual and Aesthetic Impact Methodology	12
10.1	Laws, Regulations, and Guidelines	12
10.2	General Methodology	12
Section 11	.....	13
11.0	Section 4(f), 6(f), and Other Unique Lands Impact Methodology	13
11.1	Laws, Regulations, and Guidelines	13
11.2	General Methodology	13
Section 12	.....	14
12.0	Historical Resources Impact Methodology	14
12.1	Laws, Regulations, and Guidelines	14
12.2	General Methodology	14
Section 13	.....	15
13.0	Archeological Resources Impact Methodology	15
13.1	Laws, Regulations, and Guidelines	15
13.2	General Methodology	15
Section 14	.....	16
14.0	Business and Residential Relocation Impact Methodology	16
14.1	Laws, Regulations, and Guidelines	16
14.2	General Methodology	16
Section 15	.....	17
15.0	Socio-Economic Impact Methodology	17
15.1	Laws, Regulations, and Guidelines	17
15.2	General Methodology	17
Section 16	.....	18
16.0	Environmental Justice Impact Methodology	18
16.1	Laws, Regulations, and Guidelines	18
16.2	General Methodology	18
Section 17	.....	19
17.0	Contaminated Sites Impact Methodology	19
17.1	Laws, Regulations, and Guidelines	19
17.2	General Methodology	19
Section 18	.....	20
18.0	Indirect Effects Impact Methodology	20
18.1	Laws, Regulations, and Guidelines	20
18.2	General Methodology	20
Section 19	.....	21
19.0	Cumulative Effects Impact Methodology	21
19.1	Laws, Regulations, and Guidelines	21
19.2	General Methodology	21

Section 1

1.0 Introduction

1.1 Purpose of Impact Analysis Methodology

Section 139 of Title 23 of the United States Code (USC) requires Lead Agencies for proposed federally funded transportation projects to determine the appropriate methodology and level of detail for analyzing impacts of these proposed transportation projects in collaboration with other state and local agencies. The Federal Highway Administration (FHWA) and the Wisconsin Department of Transportation (WisDOT) are Joint Lead Agencies for the I-39/90/94 Study. Other federal, state and local agencies that are involved in the study process are designated as Cooperating or Participating Agencies. The Cooperating and Participating Agencies, and their roles, are identified in the *Coordination Plan for Agency and Public Involvement* for this project.

Impact Analysis Methodology for the I-39/90/94 Study is described in two reports, a General Impact Analysis Methodology Report, which is housed on the project's website, and a Project Specific Impact Analysis Report is included as Appendix A in the Coordination Plan for Agency and Public Involvement.

The General Impact Analysis Methodology Report contains two sections: the first section, laws, regulations and guidelines; and the second section, general methodologies commonly used on proposed WisDOT transportation projects to define, identify, and determine potential impacts to the resource.

The Project Specific Impact Analysis Methodology Report includes project specific methodologies.

Consensus on the methodology¹ is not required, but the Joint Lead Agencies must consider the views of the Cooperating and Participating agencies with relevant interests before making a decision on a particular methodology. Well-documented, widely accepted methodologies, such as those for noise impact assessment and evaluation of impacts under Section 106 of the National Historic Preservation Act, would require minimal collaboration. If a Cooperating or Participating agency has concerns about the proposed methodology for a particular environmental factor, the agency should describe its preferred methodology and why it is recommended.

The purpose of the IAM Report is to communicate and document the Joint Lead Agencies' structured approach to analyzing impacts of the proposed transportation project and its alternatives. Collaboration on the impact analysis methodology is intended to promote an efficient and streamlined process and early resolution of concerns or issues.

¹ The methodology used by the lead agency must be consistent with any methodology established by statute or regulation under the authority of another federal agency.

Section 2

2.0 Agricultural Impact Methodology

2.1 Laws, Regulations, and Guidelines

Agricultural Impacts are evaluated in accordance with these key laws, regulations, or guidelines.

- Farmland Protection Policy Act of 1981 (7 USC 4201-4209)
- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- WisDOT Facilities Development Manual (FDM) Chapter 24, Section 10, Agricultural Lands
- Chapter 32.035, Wisconsin Statutes, Agricultural Impact Statement

2.2 General Methodology

To the extent practicable, the proposed transportation action and its alternatives are developed to minimize impacts on farmland and maximize compatibility with state and local farmland programs and policies. If new right of way is to be acquired, a Farmland Conversion Impact Rating form would be prepared and coordinated with the U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS). Agricultural impacts are quantified and reported to the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP). Based on the extent of the impacts, DATCP will determine whether an Agricultural Impact Statement is required.

Section 3

3.0 Upland Habitat / Wildlife Impact Methodology

3.1 Laws, Regulations, and Guidelines

Upland habitat/wildlife impacts are evaluated in accordance with these key laws, regulations or guidelines.

- Fish and Wildlife Coordination Act as amended (16 USC 661-667)
- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- WisDOT FDM Chapter 24, Section 10, Land and Water Resource Impacts
- FHWA Guidelines for Consideration of Highway Project Impacts on Fish and Wildlife Resources, 1989

3.2 General Methodology

Upland habitat includes non-wetland areas that have vegetative cover suitable for supporting wildlife. Such areas include woodlands/shrub thickets, fallow fields, fence lines, and remnant prairies dominated by grasses and forbs. WisDOT coordinates with the Wisconsin Department of Natural Resources (WDNR), other agencies, and regional planning commissions as appropriate to obtain information on the quality and classification of wildlife habitat in the project's area of potential effect.

Impact evaluation includes an assessment of existing conditions (community type, connectivity to other resources, wildlife associations), amount and type of habitat affected by the proposed project, fragmentation or severance of ecosystems, and possible effects on wildlife permanently inhabiting or passing through the upland habitat areas. At this time, FHWA does not have a policy for mitigating upland habitat impacts. It is FHWA's position that normal practices such as providing appropriate management of highway right-of-way, using location, design and construction techniques to minimize habitat impacts, and reestablishment of suitable vegetated areas through appropriate landscaping will adequately mitigate the loss of upland wildlife habitat.

Section 4

4.0 Threatened and Endangered Species Impact Methodology

4.1 Laws, Regulations, and Guidelines

Threatened and endangered species impacts are evaluated in accordance with these key laws; regulations or guidelines:

- Endangered Species Act of 1973 (7 USC 136; 16 USC 1531-1544)
- Migratory Bird Treaty Act (16 USC 661)
- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- FHWA guidance memo, Management of the Endangered Species Act Environmental Analysis and Consultation Process, 2002
- Wisconsin Administrative Code Chapter NR 27, Endangered and Threatened Species, 2005
- WisDOT/WDNR Cooperative Agreement Amendment, Memorandum of Understanding on Endangered and Threatened Species Consultation, 1998
- WisDOT FDM Chapter 24, Land and Water Resources
- U.S. Army Corps of Engineers (USACE) Regulations for Processing Department of the Army Permits (33 CFR, Part 325); regulations include consideration of threatened and endangered species.
- Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c)

4.2 General Methodology

The impact evaluation for threatened and endangered species includes a determination of the presence or absence of any federally listed or state listed threatened or endangered species or their critical habitat in the transportation project's area of effort. The presence or absence determination is made in consultation with WDNR and the U.S. Fish and Wildlife Service (USFWS) and may include field inventories by qualified resource biologists.

If federally threatened or endangered species or their critical habitat is present and cannot be avoided by location and design refinements to the proposed transportation project, consultation would occur under Section 7 of the Endangered Species Act. FHWA is the lead agency for Section 7 consultation, in cooperation with WisDOT. Consultation would involve applicable agencies including the USFWS and WDNR.

For state listed species, WisDOT would develop a conservation plan or lay the groundwork for an incidental take permit in consultation with WDNR for unavoidable impacts. WisDOT will also incorporate construction contract special provisions to eliminate or reduce impacts.

Section 5

5.0 Water Resource and Floodplain Impact Methodology

5.1 Laws, Regulations, and Guidelines

Water resource and floodplain impacts are evaluated in accordance with these key laws, regulations, and guidelines:

- Clean Water Act (33 USC 1251) including Section 303(d), impaired waters
- Section 10 of the Rivers and Harbors Act (33 USC 401 et seq.)
- Executive Order 11988, Floodplain Management (42 FR 26951)
- Compensatory Mitigation Rule requirements (33 CFR 332)
- DOT Executive Order 5650.2, Floodplain Management and Protection; Policies and Procedures (23 CFR 650)
- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- WisDOT FDM Chapter 24, Land and Water Resources Impacts, FDM Chapter 10,
- Erosion Control and FDM Chapter 13, Drainage
- Wisconsin Administrative Code Chapter NR 116, Wisconsin's Floodplain Management Program
- WisDOT/WDNR Cooperative Agreement Amendment, Memorandum of Understanding on Erosion Control and Storm Water Management, 1994
- Wisconsin Administrative Code Chapter TRANS 401, Construction Site Erosion Control and Storm Water Management Procedures for Department Actions

5.2 General Methodology

Transportation alternatives involving water resources and floodplain impacts are developed to minimize adverse impacts to water quality, floodplains, and aquatic habitat to the maximum extent practicable. Measures to minimize adverse effects include using sound erosion control and storm water management practices, providing compensatory storage for floodplain storage districts, and sizing new and replacement structures to reduce floodplain encroachment and increases in the height of the regional (100-year) floodplain elevation. Properly minimizing adverse effects requires assessment of existing conditions such as water quality, fishery resources, floodplain functions and values, watershed stability, potential undesirable outcomes to these conditions, and proposed measures to minimize the adverse effects.

The extent to which erosion control and storm water management measures, i.e. conceptual Best Management Practices (BMPs) or specific erosion control and storm water management commitments, are proposed in the EIS depends on the type of transportation improvements being proposed, the construction time frame, and the extent of water and floodplain resources in the project's area of effect. A planning level project generally includes conceptual BMPs, other projects may require more specific erosion control and storm water management commitments.

Section 6

6.0 Wetland Impact Methodology

6.1 Laws, Regulations, and Guidelines

Wetland impacts are evaluated in accordance with these key laws, regulations, or guidelines:

- Sections 401 and 404 of the Clean Water Act (33 USC 1251)
- Clean Water Act, 40 CFR Part 230, Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material
- Executive Order 11990, Protection of Wetlands (42 FR 26961)
- Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Part 332)
- DOT Executive Order 5660.1A, Preservation of the Nation's Wetlands
- Fish and Wildlife Coordination Act as amended (16 USC 661-667)
- FHWA policy and procedures for evaluation and mitigation of adverse environmental impacts to wetlands and natural habitat (23 CFR 777)
- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- WisDOT FDM Chapter 24, Section 5, Aquatic Systems
- WisDOT Wetland Mitigation Banking Technical Guideline as amended, March 2002
- WisDOT/WDNR Memorandum of Understanding, Compensatory Mitigation for Unavoidable Wetland Losses Resulting from State Transportation Activities, 2012
- Army Corps of Engineers Wetland Delineation Manual (1987 Manual)
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North central and Northeast Region (Version 2.0), January 2012
- Final National Wetland Plant List, U.S. Army Corps of Engineers, Federal Register, Volume 77, Number 90, May 9, 2012; updated March 2014
- Field indicators of Hydric Soils in the United States published by NRCS (Version 7.0), 2010
- Guidance for Submitting Wetland Delineation Reports to the St. Paul District Army Corps of Engineers and the DNR, 2014

6.2 General Methodology

Depending on the type of transportation improvements being proposed, the construction time frame, and the extent of wetland resources in the project's area of potential effect, approximate wetland boundaries are established using existing information such as the Wisconsin Wetland Inventory maps produced by the WDNR, county soil survey, and farmed wetland maps produced by the USDA NRCS statewide, regional or local GIS data, and field surveys. If more precise wetland boundaries are required, more detailed wetland boundary determinations or delineations would be conducted in accordance with the interagency Corps of Engineers Wetland Delineation Manual (1987 Manual), subsequent guidance such as the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North central and Northeast Region (Version 2.0), January 2012, Field indicators of Hydric Soils in the United States published by NRCS (Version 7.0), 2010, and the Final National Wetland Plant List published by the USACE in March 2014.

Transportation improvement alternatives are developed to reduce wetland impacts to the extent practicable through a sequence of avoiding wetlands where possible, minimizing impacts to wetlands that cannot be avoided and mitigating unavoidable wetland loss through various compensation measures as specified in WisDOT's Wetland Mitigation Banking

Technical Guideline, and in the USACE regulations, Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Part 332). Mitigation banking is the preferred compensation option, though WisDOT and WDNR agree that other practicable and ecologically valuable project specific opportunities may be pursued on a case-by-case basis. All unavoidable wetland loss would be fully compensated in terms of amount affected, type, and functional values.

Section 7

7.0 Air Quality Impact Methodology

7.1 Laws, Regulations, and Guidelines

Air Quality impacts are evaluated in accordance with these key laws, regulations or guidelines.

- Section 176(c) of the Clean Air Act Amendments of 1990 (42 USC 7401)
- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- Determining Conformity of Federal Actions to State or Federal Implementation Plans (40 CFR, Part 93), EPA
- Transportation Conformity Guidance for Qualitative hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas, March 2006, EPA and FHWA
- FHWA air quality conformance guidance (23 CFR 450)
- FHWA Interim Guidance on Air Toxics Analysis in NEPA Documents, 2006 (updated in September, 2009)
- Wisconsin State Implementation Plan for Air Quality

7.2 General Methodology

The Environmental Protection Agency (EPA) has set national air quality standards for six principal air pollutants (also referred to as criteria pollutants): Carbon Monoxide (CO), lead, Nitrogen Dioxide (NO₂), ozone, particulate matter, and sulfur dioxide. Transportation contributes to CO, NO₂, ozone and particulate matter. Applicable transportation improvements are evaluated for ozone, carbon monoxide, mobile source air toxics and particulate matter in accordance with established air quality assessment techniques.

The build alternatives are screened to determine whether project level evaluation of Carbon Monoxide (CO) emissions is required. The first screening step utilizes the indirect source permit exemption criteria previously established by WDNR in Wisconsin Administrative Code Chapter NR 411, Construction and Operation Permits for Indirect Sources. Although NR 411 was suspended by the Wisconsin Legislature in March 2012 (based on WDNR's determination that automobile CO emissions have decreased dramatically and therefore Wisconsin no longer exceeds the CO National Ambient Air Quality Standards (NAAQS)) WisDOT in consultation with FHWA, has elected to continue using the following exemption criteria as a screening tool for WisDOT projects:

- For highway projects located outside the metropolitan counties* any new road segment or intersection leg that will carry less than four lanes of traffic or any modified road segment or intersection that will have less than two additional lanes of traffic within 10 years after construction.

** The metropolitan counties are Brown, Calumet, Chippewa, Dane, Douglas, Eau Claire, Kenosha, La Crosse, Marathon, Milwaukee, Outagamie, Ozaukee, Racine, Rock, Sheboygan, St. Croix, Washington, Waukesha, and Winnebago.*

Any highway project that will meet the following criteria for location and traffic volumes within 10 years after construction or modification:

- Any new road segment or new intersection leg in a metropolitan county that will have a peak hour volume of less than 1,200 vehicles per hour.
- Any new road segment or new intersection leg in a metropolitan county that will have an increase in peak hour volume of less than 1,200 vehicles per hour.
- Any new road segment or new intersection leg outside a metropolitan county that will have a peak hour volume of less than 1,800 vehicles per hour.

Where there is a shift in one or more of the intersection approach legs, one of the following:

- The maximum shift in the nearest roadway edge toward any potential receptor within a new or modified intersection boundary will be less than 12 feet.
- Where the shift in the nearest roadway edge toward any potential receptor is 12 feet or more, each new road segment has no more than two approach lanes (not including exclusive turning lanes), and any potential receptor is located at more than 25 feet from the nearest roadway edge, a peak hour volume on each approach leg of less than 1,800 vehicles per hour.

Projects that meet the exemption criteria listed above do not require further evaluation for CO emissions.

For projects that do not meet the exemption criteria listed above, additional screening may be done by referencing past projects that represent a worst-case scenario compared to the currently proposed project and that did not exceed the CO NAAQS based on modeling results. If applicable past projects are found, the comparison would be described in the EIS and no further CO analysis would be required. If no applicable past projects are found, the worst case build alternative for the currently proposed project will be modeled using MOVES/CAL3QHC. The results of the modeling will be compared to the CO NAAQS and summarized in the EIS.

Section 8

8.0 Traffic Noise Impact Methodology

8.1 Laws, Regulations, and Guidelines

Highway noise impacts are evaluated in accordance with these key laws, regulations or guidelines:

- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- FHWA Federal Aid Policy Guide, Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772) (Revised in July 2010)
- WisDOT FDM Chapter 23, Noise (Revised in July 2011 to reflect FHWA's revised noise policy)
- Wisconsin Administrative Code Chapter TRANS 405, Siting Noise Barriers (Serves as supplement to WisDOT's noise policy in FDM Chapter 23)

8.2 General Methodology

Transportation projects are evaluated for traffic noise impacts and abatement measures to help protect the public health and welfare, to provide noise abatement criteria and to provide information to local officials for land use planning near highways. The noise analysis also provides information on noise generated from typical construction equipment during the construction period.

Existing and design year traffic noise levels are modeled at residential, commercial, and other sensitive receptors along the project corridor using FHWA's Traffic Noise Prediction Model (TNM) 2.5 computer program. The TNM includes traffic characteristics that yield the greatest hourly traffic noise on a regular basis for existing conditions and the future design year. Noise impacts will be evaluated further to determine the reasonableness and feasibility of potential mitigation measures such as noise walls. If noise mitigation is determined reasonable, additional public involvement related to noise mitigation would be initiated in the project's design phase.

Section 9

9.0 Construction Impact Methodology

9.1 Laws, Regulations, and Guidelines

Construction impacts are evaluated in accordance with these key laws, regulations, or guidelines.

- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- FHWA Work Zone Safety and Mobility Rule (69 FR 54562), 2004

9.2 General Methodology

Discussion of construction related impacts may include access to facilities and services, emergency response, air quality (emissions and fugitive dust), noise, water quality (erosion and sedimentation), construction solid waste/hazardous waste, and vibration as applicable. Additional construction related information will include conceptual discussions about construction material sources (borrow sites), and major utility adjustments/associated impacts.

A transportation management plan (TMP) for work zones provides management strategies for work zone impacts and safety in all project development phases. Strategies include temporary traffic control measures and devices, public information and outreach; and operational strategies such as travel demand management, signal retiming and traffic incident management. Preliminary information is developed in the project's planning phase with input from the public, local officials and other interests, and developed further in the engineering design phase.

Section 10

10.0 Visual and Aesthetic Impact Methodology

10.1 Laws, Regulations, and Guidelines

Aesthetic (visual) impacts are evaluated in accordance with these key laws, regulations, or guidelines.

- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- FHWA publication Guidelines for the Visual Impact Assessment of Highway Projects (FHWA HEP015-029) – January 2015
- WisDOT FDM Chapter 27, Section 10, Visual Impact Assessment

10.2 General Methodology

The purpose of the visual impact assessment is to preserve and enhance the visual character of the project corridor. This is accomplished by identifying the visual character of the project corridor, characterizing the visual quality of the area, and identifying and quantifying viewer groups to the extent practicable. The impact assessment also describes the visual change that will occur due to the proposed transportation improvements. Mitigation measures, where adverse visual effects are identified, could include landscaping and aesthetic treatments such as retaining walls, bridge abutments and sidewalks in the project area.

Section 11

11.0 Section 4(f), 6(f), and Other Unique Lands Impact Methodology

11.1 Laws, Regulations, and Guidelines

Impacts to public use lands (existing and planned public parks, recreation areas, wildlife and waterfowl refuges, other public-use lands and historical sites) are evaluated in accordance with these key laws, regulations, or guidelines.

- Section 4(f) of the U.S. DOT Act (23 USC 138; 49 USC 303)
- 23 CFR 774, FHWA's regulations for implementing Section 4(f) requirements for parks, recreation areas, wildlife and waterfowl refuges and historic sites
- FHWA Section 4(f) Policy Paper (Federal Register, July 20, 2012)
- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- Section 6(f) of the Land & Water Conservation Fund Act (LWCF) as amended (16 USC 4601)
- Federal Aid in Sport Fish Restoration Act (Dingell-Johnson Act) as amended (16 USC 777)
- Pittman-Robertson Wildlife Restoration Act (16 USC 669)
- WisDOT FDM Chapter 21, Environmental Documents, Reports and Permits, Chapter 26, Cultural Resources Preservation
- Other public use land funding programs such as those administered by the National Park Service, NRCS, and WDNR

Section 4(f) of the U.S. Department of Transportation (U.S. DOT) Act applies only to the actions of agencies within the U.S. DOT including FHWA. While other agencies may have an interest in Section 4(f), FHWA is responsible for applicability determinations, evaluations, findings and overall compliance.

11.2 General Methodology

The public use land impact evaluation includes an inventory of such resources in the transportation project's area of effect, a description of the resources including existing and planned use, funding sources, and jurisdictional agencies. The transportation improvements are located and designed to avoid or minimize impacts to public use land to the extent practicable. Where such resources cannot be avoided, impacts would be analyzed by the amount of land required from the resource and any construction impacts such as increased traffic noise, changes in the visual setting, or other impacts that would adversely affect the public use land. WisDOT would coordinate with the jurisdictional agencies to obtain information on resource use, funding and management, and to obtain input on potential effects and possible mitigation measures. The Section 6(f) land mitigation process will follow the conversion proposal documentation and Land and Water Conservation Fund (LWCF) Project Amendment procedures of the National Park Service (NPS), with assistance of the State-level LWCF officer.

Section 12

12.0 Historical Resources Impact Methodology

12.1 Laws, Regulations, and Guidelines

Historic resource impacts for transportation projects are evaluated in accordance with the following key regulations and guidance.

- Sections 106 and 110 of the National Historic Preservation Act as amended (16 USC 470)
- Section 106 regulations (36 CFR Part 800)
- FHWA's Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- 23 CFR 774, FHWA's regulations for implementing Section 4(f) requirements for parks, recreation areas, wildlife and waterfowl refuges and historic sites
- WisDOT's Facilities Development Manual, Chapter 26, Cultural Resource Preservation
- U.S. Army Corps of Engineers Regulations for Processing Department of the Army Permits (33 CFR, Part 325); Appendix C of the regulations includes procedures for protection of historic properties

12.2 General Methodology

Impact evaluation includes identification of historic resources in the project's area of potential effect which generally consists of existing and proposed right-of-way, temporary and permanent easements, equipment staging areas, and other land that would be disturbed by the project.

Historic investigations are done by qualified historians in accordance with established procedures developed jointly by WisDOT and the Wisconsin Historical Society and include evaluation of the resources to determine eligibility to the National Register of Historic Places, assessment of effects to determine whether an adverse effect will occur, consultation with the State Historic Preservation Office (SHPO), Indian tribes, and other parties indicating an interest in the historic resources, and implementation of agreements reached to account for unavoidable adverse impacts.

FHWA is the lead federal agency for the Section 106 consultation process, in cooperation with WisDOT.

Section 13

13.0 Archeological Resources Impact Methodology

13.1 Laws, Regulations, and Guidelines

Archaeological impacts for transportation projects are evaluated in accordance with the following key regulations and guidance:

- Section 106 of the National Historic Preservation Act as amended (16 USC 470)
- NPS regulations for curation of federally-owned and administered archaeological collections (36 CFR 79)
- NPS Secretary of the Interior's Archaeology and Historic Preservation Standards and Guidelines, as amended and updated
- FHWA's Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- U.S. Army Corps of Engineers Regulations for Processing Department of the Army Permits (33 CFR, Part 325); Appendix C of the regulations includes procedures for protection of historic properties
- Chapter 157, Wisconsin Statutes, Disposition of Human Remains; Wis. Stat. § 157.70 Burial Sites Preservation
- WisDOT's FDM, Chapter 26, Cultural Resource Preservation
- Guide for Public Archaeology in Wisconsin. The Wisconsin Archaeological Survey, August 2012.

13.2 General Methodology

Impact evaluation includes identification of archaeological resources in the project's area of potential effect which generally consists of existing and proposed right-of-way, temporary and permanent easements, equipment staging areas, and other land that would be disturbed by the project.

Archaeological investigations are done by qualified professionals as defined by the NPS and WHS in accordance with established procedures developed jointly by the NPS and the Wisconsin Historical Society and include evaluation of the resources to determine eligibility to the National Register of Historic Places (NRHP), assessment of effects to determine whether an adverse effect will occur, consultation with the SHPO, Indian tribes, and other parties indicating an interest in the archaeological resources, and implementation of agreements reached to account for unavoidable adverse impacts.

The services of a qualified professional will be required to determine if any encountered skeletal material is human or if any burial site boundary extends into the project's Area of Potential Effect.

Section 14

14.0 Business and Residential Relocation Impact Methodology

14.1 Laws, Regulations, and Guidelines

Business and residential impacts are evaluated in accordance with these key laws, regulations or guidelines:

- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (49 CFR Part 24)
- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987

14.2 General Methodology

Evaluation of business impacts includes an estimate of the number and types of businesses to be displaced, number of employees/jobs affected, any special characteristics, and availability of replacement business sites. Evaluation of residential impacts includes an estimate of the number of homes to be displaced including family characteristics; availability of comparable decent, safe, and sanitary housing in the area; any measure to be taken when replacement housing is insufficient; and identification of any special relocation needs. Depending on the number and types of businesses or homes displaced, a Conceptual Stage Relocation Plan (CSRP) may be prepared as part of the EIS. Impacts to businesses and homes due to changes in access during and after construction are also evaluated.

Section 15

15.0 Socio-Economic Impact Methodology

15.1 Laws, Regulations, and Guidelines

Socioeconomic impacts are evaluated in accordance with these key laws, regulations or guidelines:

- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- WisDOT Facilities Development Manual (FDM) Chapter 25, Socioeconomic Factors
- Wisconsin State Statute §84.01(35)

15.2 General Methodology

Evaluation of social impacts includes applicable changes in neighborhoods or community cohesion; changes in travel patterns and accessibility; impacts on community facilities; impacts on traffic safety/public safety; and impacts on any special groups such as elderly, handicapped, minority, and transit-dependent persons. Evaluation of economic impacts includes cost estimates of the proposed action and its alternatives, effects on highway-dependent businesses and effects on existing and planned business development.

Socioeconomic impacts that can be quantified based on available data will be presented as such in the EIS and other impacts will be discussed qualitatively.

Section 16

16.0 Environmental Justice Impact Methodology

16.1 Laws, Regulations, and Guidelines

Environmental Justice impacts are evaluated in accordance with these key laws, regulations or guidelines:

- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 1994
- Title VI of the federal Civil Rights Act, 42 USC Section 2000d
- U.S. DOT Order on Environmental Justice, DOT Order 5610.2(a), 2012
- FHWA Order T6640.23A, FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 2012
- WisDOT FDM Chapter 21-15-1, Format and Content of Environmental Documents (includes Environmental Justice as one of the factors to be considered when evaluating resource impacts)

16.2 General Methodology

The proposed action and its alternatives are evaluated to determine whether there would be disproportionately high and adverse impacts on minority and low income populations with respect to human health and the environment. Potential impact categories include air, noise, or water pollution; increased traffic congestion; changes in aesthetic value; disruption of community cohesion or economic vitality; changes in the availability of public and private facilities and services; adverse employment effects; and displacement of homes, businesses, or other facilities.

Consideration of Environmental Justice in transportation decision-making is based on the following principles listed in the WisDOT FDM Chapter 21-15-1:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects on minority populations and low-income populations
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations

Section 17

17.0 Contaminated Sites Impact Methodology

17.1 Laws, Regulations, and Guidelines

The impacts of potential environmental contaminants are evaluated in accordance with these key laws, regulations or guidelines:

- Resource Conservation and Recovery Act of 1976 as amended (42 USC 6901)
- FHWA Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, 1987
- WisDOT FDM, Chapter 21, Section 35, Contaminated Site Assessments and Remediation

17.2 General Methodology

The Phase 1 investigation for potentially contaminated sites uses field observations, interviews and records searches to identify sites that have a high likelihood for contamination. Phase 1 screening is performed for all alternatives carried forward in the environmental document. A Phase 2 investigation which includes subsurface testing is performed on sites located within the area of effect for the preferred alternative. Further investigation is performed when necessary after a preferred alternative is selected. WisDOT also evaluates existing highway structures that need to be replaced or rehabilitated as part of a proposed transportation improvement to determine whether any asbestos materials were used in the construction, renovation or rehabilitation of the structures.

Section 18

18.0 Indirect Effects Impact Methodology

18.1 Laws, Regulations, and Guidelines

Indirect effects are evaluated in accordance with these key laws, regulations, or guidelines.

- National Cooperative Research Program (NCHRP) Report 466, Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects, 2002
- WisDOT Guidance for Conducting an Indirect Effects Analysis, November 2014
- 40 CFR, Chapter 1, Section 230.11(g)(h); Protection of Environment, Environmental Protection Agency, Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material
- 33 CFR, Part 230, Section 320.4(a)(1); Navigation and Navigable Waters, General Regulatory Policies, General Policies for Evaluating Permit Applications

Indirect effects 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).

18.2 General Methodology

The indirect effects analysis methodology includes the following key components:

- Determine the study area boundaries
- Inventory the study area and notable features such as land use/development trends, demographics and natural resources including aquatic ecosystems
- Identify impact-causing activities of the proposed project alternatives
- Identify the potentially significant indirect effects
- Analyze indirect effects, describe their significance for the project alternatives and evaluate assumptions
- Assess consequences and identify mitigation measures
- The analysis is supported by input/information from local officials, agencies, and community outreach activities

Section 19

19.0 Cumulative Effects Impact Methodology

19.1 Laws, Regulations, and Guidelines

Cumulative effects are evaluated in accordance with these key laws, regulations or guidelines:

- Council on Environmental Quality (CEQ) publication, Considering Cumulative Effects under the National Environmental Policy Act, 1997
- FHWA position paper, Secondary and Cumulative Impact Assessment in the Highway Development Process, 1992
- WisDOT Guidance for Conducting a Cumulative Effects Analysis, November 2007
- 40 CFR, Chapter 1, Section 230.11(g)(h); Protection of Environment, Environmental Protection Agency, Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material
- 33 CFR, Part 230, Section 320.4(a)(1); Navigation and Navigable Waters, General Regulatory Policies, General Policies for Evaluating Permit Applications

Cumulative effects are impacts on the environment that result 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

19.2 General Methodology

The cumulative effects analysis methodology includes the following key components:

- Identify the significant issues associated with the proposed action and define the assessment
- Establish geographic scope for the analysis
- Establish future timeframe for analysis
- Identify other actions affecting the resources, ecosystems (including aquatic ecosystems) and human communities of concern
- Characterize resources identified in terms of their response to change and capacity to withstand stress
- Characterize the stresses affecting the resources and their relationship to regulatory thresholds
- Define a baseline condition for the resources
- Identify the important cause and effect relationships between human activities and resources
- Determine the magnitude and significance of cumulative effects
- Modify or add alternatives to mitigate significant cumulative effects
- Monitor the cumulative effects of the selected alternative and recommend management practices as appropriate to prevent or mitigate undesirable effects.
- The analysis is supported by input/information from local officials, agencies, and community outreach activities