



# FACILITIES DEVELOPMENT MANUAL

Wisconsin Department of Transportation

## T409

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**Revise 5-2 Exhibit 1.1 (FHWA and WisDOT Stewardship & Oversight of Projects through Implementation of a Risk-Based Approach) with the November 2017 updated information.**

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**Chapter 8: Consultant Services**

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**Revise 8-5-2.3 (Length of Contracts) to change from Administrator of the Division of Business Management to Administrator of the Division of Transportation Investment Management.**

- [Section 8-10](#) ..... Contract Negotiation
- [Section 8-15](#) ..... Contracts

**Revise 8-15-2.5 (Contract Provisions) to remove information relating to DT1511 (Consultant Redistribution Contract Invoice Form). WisDOT consultants are to use the CARS system.**

**Revise 8-15-2.6 (Contract Management/Invoicing) to remove information relating to DT1511 (Consultant Redistribution Contract Invoice Form). WisDOT consultants are to use the CARS system.**

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**Revise FDM 9-45 Attachment 40.3 (Wisconsin County Coordinate System Numbers and Abbreviations) to revise the County coordinate system numbers.**

- [Section 9-50](#) .....Alignments - Reference Line With Stationing
- [Section 9-55](#) .....Drainage Structure Surveys
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- [Section 11-5](#) .....General Design Considerations

**Revise 11-5-2 (Traffic Demand Forecasts) guidance information. Remove former Attachments 2.1, .2.2 and 2.3 relating to traffic forecasting.**

**Revise FDM 11-5-3 (Highway Capacity) guidance information and traffic analysis software selection tools.**

- [Section 11-10](#) .....Design Controls
- [Section 11-15](#) .....Cross-section Elements for Rural Highways and Freeways

**Revise FDM 11-15 Attachments 1.6 and 1.7 (Typical Cross Sections) to clarify the drawings and update the design notes.**

- [Section 11-20](#) .....Cross Section Elements for Urban Highways
- [Section 11-25](#) .....Intersections at Grade
- [Section 11-26](#) .....Roundabouts

**Revise 11-26-10.1.1 (Pedestrians) guidance.**

**Revise 11-26-20 (Roundabouts - Operations) primary to reflect and incorporate the Highway Capacity Manual 6th Edition (HCM) methodologies.**

- [Section 11-30](#) .....Interchange
- [Section 11-35](#) .....Structures
- [Section 11-40](#) .....Resurfacing, Restoration and Rehabilitation (3R) Projects for Highways other than Interstate
- [Section 11-44](#) .....Interstate Highways

[Section 11-45](#) ..... Other Elements Affecting Geometric Design

[Section 11-46](#) ..... Bicycle and Pedestrian Accommodations

**Revise FDM 11-46 title from “Design - Complete Streets” to “Design - Bicycle and Pedestrian Accommodations”.**

**Revise 11-46-1.1 (Introduction, Purpose, Definitions, Overview) to update Federal and State regulations.**

**Revise 11-46-1.3.1 (Evaluation Criteria) to update guidance.**

**Revise 11-46-5.1.1 (ADA Compliance) to update guidance.**

**Revise 11-46-5.2.1 (Sidewalks) to update guidance.**

**Revise 11-46-10.1 (Curb Ramps - Introduction) to update guidance.**

**Revise 11-46-10.2 (Curb Ramps and Detectable Warning Fields) to update guidance.**

**Revise 11-46-10.2.2 (Truncated Domes) to update guidance.**

**Revise 11-46-10.2.3 (Detectable Warning Fields) to update guidance.**

**Revise 11-46-10.2.4 (Detectable Warning Field Placement) to update guidance.**

**Revise 11-46-10.3 (Curb Ramp Design Consideration) to update guidance.**

**Revise 11-46-15.3 (Urban On-road Bicycle Accommodations) to update guidance.**

[Section 11-50](#) ..... Traffic Control

**Add 11-50-20.10 (Smart Work Zones) and associated sub-sections to add guidance for smart work zone technologies.**

**Revise FDM 11-50 Attachment 20.2 (Work Zone Traffic Control Plan Review Checklist) to edit work zone pavement marking identifications.**

**Remove FDM 11-50 Attachment 30.2 (Corridor Delay Map).**

**Add 11-50-31.4.10 (Lighting Temporary Pedestrian Accommodation) to add guidance regarding lighting for temporary pedestrian accommodations.**

[Section 11-52](#) ..... Traffic Engineering and Operations

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[Section 11-60](#) ..... Detours

## **Chapter 12: Right-of-Way Plat Development**

[Section 12-1](#) ..... General

[Section 12-5](#) ..... Making Right-of-Way Determinations

[Section 12-10](#) ..... Transportation Project Plat Preparation

**Revise 12-10 Attachment 20.1 and 20.2 (Legal Description Verbiage and Examples) to update language.**

[Section 12-15](#) ..... Traditional Right-of-Way Plat Preparation

## **Chapter 13: Drainage**

[Section 13-1](#) ..... Drainage Practice

[Section 13-5](#) ..... Field Work

[Section 13-10](#) ..... Hydrology

[Section 13-15](#) ..... Hydraulic Design of Culverts

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- [Section 14-1](#) ..... General
- [Section 14-5](#) ..... Base Course
- [Section 14-10](#) ..... Pavement Design
- [Section 14-15](#) ..... Pavement Type Selection

**Revise 14-15 Attachment 5.1 (Pavement Design Report Outline) to update information.**

- [Section 14-25](#) ..... Pavement Rehabilitation

**Chapter 15: Plan Preparation**

- [Section 15-1](#) ..... Standards

**Revise 15-1 Attachment 5.4 (Sample Detail Sheet (Construction Details)) to update sample construction detail for overhead sign supports.**

**Revise 20.10 (Permanent Signing) to add information for tapered column and cord mast arms.**

- [Section 15-5](#) ..... Methods

**Revise 15-5 Attachment 3.1 (CADDs AutoCAD Civil 3D Project Folder Structure Standard) to update right-of-way information.**

**Add 15-5-7.1.1 (Exception to Design Model Requirements) to add guidance regarding exceptions to design model requirements.**

**Revise 15-5-7.2.1 (Surface Model Types) to remove EBS, all sub-base surfaces, pavement surface and base course surfaces and add rural driveway surface model requirements.**

**Revise 15-5-7.2.2.1 Table 7.1 (Proposed Work Surface Model Definition Density Requirements) to revise table and notes.**

**Revise 15-5 Attachment 7.1 (Surface Model Types) to remove sub-grade improvement, subbase, pavement, and base course surface type examples.**

**Revise 15-5-7.2.2.2 Table 7.2 (Proposed Work Surface Model Feature Requirements) to remove subbase, EBS, pavement, base course columns and table information.**

- [Section 15-10](#) ..... Review

**Chapter 17: Railroad Coordination**

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- [Section 17-15](#) ..... Types of Programs
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- [Section 17-30](#) ..... Crossing Surface Projects
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**Chapter 19: Plans, Specifications, and Estimates**

[Section 19-1](#) .....Introduction

[Section 19-5](#) .....Estimates

[Section 19-10](#) .....PS&E Transmittal and Composition

**Revise 19-10-15.1.4 (Synopsis of Significant Approvals, Acceptances or Completed Action) to update the environmental document types.**

**Revise 19-10-15.1.7 (Right-of-Way and Utilities) to update guidance.**

**Remove former subsection 19-10-15.1.22 (Functional Classification of Road) and renumber remaining subsections.**

**Add 19-10-15.1.24 (Labor Compliance Prevailing Wage Rate Decisions) to add guidance relating to prevailing wage rate decisions.**

**Remove former 19-10 Attachment 30.3 (Estimated Production Rates for Computing Contract Time) since the information is linked to in the text.**

**Revise 19-10-30.3 (Factors Influencing Contract Time) to revise production rate guidance and provide link to productivity estimation tool.**

**Revise 19-10 Attachment 43.1 (Civil 3D Metadata Sheet for WisDOT Project - Contractor Data Packet) to remove EBS, subgrade improvements, pavements and base course from proposed surface model.**

[Section 19-15](#) .....Special Provisions

**Revise 19-15-75 (Specification Modifications) to add guidance.**

**Revise 19-15-80 (Special Provision Bid Items SPV) to update guidance.**

**Revise 19-15-85.1 (Modifying an Existing STSP) to update guidance.**

[Section 19-21](#) .....Quality Management Program

**Revise 19-21-5.2.2 (QMP HMA Pavement Nuclear Density; STSP 460-020) to add guidance.**

**FDM 19-21-10 (Use of HMA Pavement Percent Within Limits QMP) is new guidance.**

[Section 19-22](#) .....Post-Advertisement Activities

[Section 19-25](#) .....Local Force Account Agreements

[Section 19-30](#) .....Razing and Removal Contracts

[Section 19-35](#) .....TEA and EDA Funded Projects

[Section 19-40](#) .....Review

**Revise 19-40 Attachment 1.2 (Standard Detail Drawings (Examiner's List)) with updated text and bid item information.**

**Chapter 20: Environmental Documents, Reports and Permits**

[Section 20-1](#) .....Introduction

Revise 20-1 (Environmental Documents, Reports and Permits - Introduction) to change chapter title from “Federal and State Environmental Laws, Regulations and Agreements” to “Environmental Documents Reports and Permits”. Guidance has been revised.

Move and revise 20-1 Attachment 1.1 (Glossary and Acronyms) from former location FDM 20-1-5.

Section 20-5 .....Major Laws, Regulations and Agreement Documents

Revise 20-5-5.1 (National Environmental Policy Act) guidance formerly found in FDM 20-5-1.1.

Revise 20-5-10.1 (Wisconsin Environmental Policy Act (WEPA) (1.11 Wis. Status) guidance formerly found in FDM 20-20-1.1.

Add 20-5-10.5 (Wisconsin Administrative Code - Chapter Trans 400) guidance.

Revise 20-5-15.1 (Wisconsin Department of Transportation (WisDOT) and Wisconsin Department of Natural Resources (WDNR) Cooperative Agreement, 1995) guidance formerly found in FDM 20-30-1.1.

Section 20-10 .....Roles and Responsibilities in the Environmental Documents Process

Revise 20-10-1 (Roles and Responsibilities) guidance.

Revise 20-10-5 (WisDOT Staff Responsibilities) guidance.

Add 20-10-10.1 (Federal Highway Administration/Federal Transit Administration) guidance.

Section 20-15 .....Environmental Document Types

Revise 20-15-1 (Environmental Documents) guidance.

Revise 20-15-5 (Determining Appropriate Environmental Document Types) guidance.

Section 20-20 .....Categorical Exclusion Documents

Revise 20-20-1 (Introduction) guidance.

Revise 20-20-5 (Categorical Exclusion Checklist) guidance.

Revise 20-20-10 (Programmatic Categorical Exclusions (PCE)) guidance.

Revise 20-20-15 (Environmental Report) guidance.

Section 20-25 .....Environmental Assessments

Revise 20-25-1 (Introduction) guidance.

Revise 20-25-5 (Process) guidance.

Revise 20-25-10 (Documentation) guidance.

Section 20-30 .....Environmental Impact Statements

Revise 20-30-1 (Introduction) guidance.

Revise 20-30-5 (Process) guidance.

Revise 20-30-10 (Documentation) guidance.

Revise 20-30-15 (Options for Preparing Final EISs) guidance.

Revise 20-30-20 (Record of Decision) guidance.

Revise 20-30-25 (Statute of Limitations) guidance.

Revise 20-30-30 (Draft and Final EIS Review, Approval and Circulation Process) guidance.

Revise 20-30-35 (Tiered EIS) guidance.

Section 20-35 .....Environmental Document Review and Approvals

Revise 20-35-1 (Introduction) guidance.

Section 20-40 .....Re-evaluating Environmental Documents

Revise 20-40-1 (Introduction) guidance.

Revise 20-40-5 (Major Action Approval) guidance.

Revise 20-40-10 (When is a Re-evaluation Required) guidance.

Revise 20-40-15 (Types of Environmental Documentation Re-evaluations) guidance.

Revise 20-40-20 (Resource Agency, Tribal, Public and Governmental Coordination) guidance.

Section 20-45 .....Other Required Documents

Revise 20-45-1 (Introduction) guidance.

Revise 20-45-5 (Section 4(f) of the Department of Transportation Act of 1966) guidance formerly found in FDM 21-25-1.

Add 20-45-10 (Land and Water Conservation Act Fund Lands and Section 6(f)) guidance.

Add 20-45-15 (Specially Funded Properties) guidance.

Add 20-45-20 (Section 106 of the National Historic Preservation Act of 1966) guidance.

Add 20-45-25 (Federal Highway Administration Wetland Funding) guidance.

Add 20-45-30 (FHWA Floodplain Report) guidance.

Revise 20-45-35 (Agricultural Impact Statement) guidance formally found in FDM 20-20-30 (State Agricultural Statues).

Revise 20-45-40 (Natural Resources Conservation Service Farmland Conservation Impact Rating) guidance formally found in FDM 20-5-25 (Federal Agricultural Law).

Add 20-45-45 (Deed Restrictions and Easements) guidance.

Section 20-50 .....Permits

Revise 20-50-5 (Federal Water Resource Permits) guidance some of which was formerly found in FDM 20-5-10 (Federal Natural Resource Law) and FDM 20-15-1 (Federal Transportation Agreements with Other Federal Agencies).

Revise 20-50-10 (Other Federal Permits) guidance some of which was formerly found in FDM 20-5-10 (Federal Natural Resource Law).

Add 20-50-15 (Tribal Permits) guidance.

Revise 20-50-20 (State Permits) guidance some of which was formerly found in FDM 20-30-5 (State Permits).

### **Chapter 21: Hazardous Materials Investigation**

Section 21-35 .....Contaminated Site Assessment and Remediation

Revise FDM Chapter 21 to change chapter title from “Environmental Documents, Reports and Permits” to “Hazardous Materials Investigation” and remove sections FDM 21-01, 21-05, 21-10, 21-15, 21-20, 21-25, 21-30 and associated attachments.

### **Chapter 22: Air Quality**

Section 22-1 .....Highway Air Quality

Section 22-5 .....Laws & Regulations Pertaining To An Air Quality Analysis

Section 22-15 .....Factors Influencing Highway Air Quality

Section 22-20 .....Mobile3 Emission Factors

Section 22-25 .....Excess Emissions and Delay

Section 22-30 .....Ambient Air Quality

[Section 22-35](#) .....Prediction Techniques  
[Section 22-40](#) .....Nonattainment Areas  
[Section 22-45](#) .....Documentation of Air Quality Analysis  
[Section 22-50](#) .....Construction or Modification and New Operation Permit

**Chapter 23: Noise**

[Section 23-1](#) .....General

**Revise 23-1-1.1 (Noise, General - Originator) to update the title of originator of chapter.**

[Section 23-5](#) .....Laws, Regulations and Policy Pertaining To Noise Analysis

**Revise 23-5-1.1 (Noise, Laws, Regulations and Policy Pertaining to Noise Analysis) to revise how Trans 405 is described. Removed former 23-5 Attachment 1.1 (FHWA Noise Abatement Criteria Hourly A-Weighted Sound Level).**

[Section 23-10](#) .....Project Analysis

**Revise 23-10-1.1 (Type I Projects) to add 2,500' length to describe an auxiliary lane per FHWA Noise website FAQs.**

**Revise 23-10-1.2 (WisDOT Retrofit Projects) to add language that the retrofit program is not currently funded.**

**Revise 23-10-1.4 (Type I Projects Requiring a Detailed Analysis) to make minor editorial additions and corrections.**

[Section 23-15](#) .....Factors Influencing Noise Levels

**Revise 23-15 1.3.3 (Ground Cover) to delete sentence regarding soft sites.**

[Section 23-20](#) .....Existing Noise Levels

[Section 23-25](#) .....Future Sound Levels

[Section 23-30](#) .....Noise Impact Determination

[Section 23-35](#) .....Noise Abatement Measures

**Revise 23-35-6 (Noise Walls) to update link, update conceptual design plan and update submittal information.**

**Revise 23-35-7.4 (Special Provisions) to update the bid item special provision numbers.**

**Revise 23-35-15.2 (Noise Barriers) to change the threshold cost reasonableness criterion for per benefit receptor, cost/sq. ft. and cost for individual receptor from \$30,000 to \$47,000, \$18.00 to \$28.00 per square foot and from \$60,000 to \$94,000. Add additional criteria for identifying receptors for sound-proofing. remove community sensitive solution and update language to clarify.**

**Revise 23-35-15.3 (Soundproofing) to edit cost reasonableness criterion and update guidance language.**

**Revise 23-35-20.1 (Public Involvement Meeting) to change public informational meeting to public involvement meeting throughout the text, add allowable texture and color language.**

**Revise 23-35-20.5 (Voting) to change condition that when an owner is also a resident of a unit in a multi-family dwelling they own, they get an extra vote. Add allowable texture and color language and change administrative record to project files.**

[Section 23-40](#) .....Construction Noise

[Section 23-45](#) .....Documentation of Noise Analysis

**Remove 23-45 Attachments 5.1 (Basic Sheet 4, Environmental Factors Matrix), Attachment 5.2 (Basic Sheet 8, Environmental Commitments), Attachment 5.3 (Factor Sheet D-2, Construction Stage Sound Quality Evaluation), Attachment 5.4 (Factor Sheet D-3, Traffic Noise Evaluation) and Attachment 5.5 (Typical A-Weighted Sound Levels) and replace with a link to the environmental forms and tools website.**

**Revise 23-45 (Noise - Documentation of Noise Analysis) with global change from basic sheet 4 to basic sheet 9, and revise language to include in the phrasing for use on environmental commitment basic sheet 8.**

[Section 23-50](#) .....Providing Sound Level Information to Local Officials

**Chapter 24: Land and Water Resources Impacts**

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- [Section 24-10](#) ..... Terrestrial Systems
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- [Section 24-20](#) ..... Endangered Species
- [Section 24-25](#) ..... Bibliography

**Chapter 25: Socio-Economic Factors**

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- [Section 25-10](#) ..... Impact Identification
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**Chapter 26: Cultural Resource Preservation**

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**Chapter 27: Planting and Aesthetic Design**

- [Section 27-1](#) ..... Introduction
- [Section 27-10](#) ..... Visual Impact Assessment
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