FDM 3-5-2 Highway Improvement Type Definitions

June 19, 2013

FDM 3-5-2 (Highway Improvement Type Definition) has remained in the same location with no text additions or edits.

TRANS 209 identifies and defines several types of highway improvement projects. This procedure provides the TRANS 209 definition for each type that will be used in classifying projects for the Six-Year STH improvement program. It also provides additional criteria and examples of different project types. Finally, it references the geometric standards to be applied to each. In the event that the applicable standards cannot be achieved, an Exception to Standards must be requested.

Designers need to understand these descriptions to help maintain the proper scope throughout the design life of a project and to ensure that if the scope must be changed, the program classification is also changed when appropriate.

See FDM 21-5-5 for guidance on the appropriate type of environmental documentation for each type of highway improvement.

2.1 Resurfacing

2.1.1 Definition

"Resurfacing" means placing a new surface on an existing roadway to provide a better all-weather surface, a better riding surface, and to extend or renew the pavement life. It generally involves no improvement in capacity or geometrics. Resurfacing may include some elimination or shielding of roadside obstacles, culvert replacements, signals, marking, signing and intersection improvements. Usually, no additional right-of-way is required; except possible minor acquisition for drainage and intersection improvements.

2.1.2 Additional Criteria

- Overlay must be placed directly on top of existing pavement (no intervening base course)
- May include spot replacement of curb and gutter in urban areas

2.1.3 Examples

See FDM 14-15 Table 1.2.

2.1.4 Standards

- Interstate: FDM 11-44-1
- Expressways and non-Interstate Freeways: FDM 11-40-1 and FDM 11-40-8.
- Non-expressway/non-freeway facilities: FDM 11-40-1 and FDM 11-40-6.

Note that "maintenance" work on connecting highways is not eligible for state funding and is therefore the responsibility of the local jurisdiction. The differentiation between a maintenance resurface (intermittent mats and mats of 2" or less) and an improvement resurface (continuous and more than 2"), as related to connecting highways, is stated in Section 6.2.5 of Chapter 09-03-02 of the Program Management Manual.

2.1.5 FIIPS Improvement Concepts

Use the following improvement concept for this task:

- RESURF Resurfacing

2.1.6 Reconditioning

2.1.6.1 Definition

“Reconditioning” means work in addition to resurfacing. Minor reconditioning includes pavement widening and shoulder paving. Major reconditioning includes improvement of an isolated grade, curve, intersection or sight distance problem to improve safety. Major recondition projects may require additional right-of-way.

2.1.6.2 Additional Criteria

- Does not include increasing the number of driving lanes
- May include replacing sections of and/or expanding existing storm sewer systems
- May include continuous pavement widening or shoulder widening on rural highways

- May include subgrade widening on rural highways in order to widen pavement or shoulders without steepening sideslopes, or to accommodate increased pavement structure depth due to resurfacing without steepening sideslopes, or to correct a structural problem
- Does not include adding continuous lanes
- May include reconstruction not to exceed 50% of the length of the project
- May include replacement of curb and gutter in urban areas with up to 50% of new curb and gutter or on new horizontal or vertical alignment.

2.1.6.3 Examples

- Resurfacing plus re-grading of some individual horizontal or vertical curves
- Resurfacing plus relocating parts of the project.
- Resurfacing plus continuously widening subgrade to allow pavement or shoulders to be widened along existing horizontal and vertical alignment
- Resurfacing plus adding non-continuous (turning, climbing or passing) lanes
- Resurfacing plus continuously or intermittently grading ditches and slopes to improve drainage or flatten vehicles recovery areas
- Placing "gravel lift" (new base course) over existing pavement and a new pavement on top of that
- Resurfacing plus adding parking lanes in urban areas.

2.1.6.4 Standards

- Interstate: FDM 11-44-1.
- Expressways and non-Interstate freeways: FDM 11-10-5, FDM 11-15-1, FDM 11-40-1, and FDM 11-40-8.
- Non-expressway/non-freeway facilities: FDM 11-40-1 and FDM 11-40-6.

2.1.6.5 FIIPS Improvement Concepts

Use the following improvement concept for this task:

- RECOND Reconditioning.

2.2 Pavement Replacement

2.2.1 Definition

“Pavement Replacement” means structural improvement to the pavement structure or removal of the total thickness of all existing asphalt and concrete paving layers from an existing roadway and providing a new paved surface without changing the subgrade. It may include restoration of the base aggregate by adding more material before repaving, or adding base aggregate open-graded with drainage system. It generally involves no improvement in capacity or geometrics. Pavement replacement may include some elimination or shielding of roadside obstacles, culvert replacement, signals, pavement marking, signing and intersection improvements. Pavement replacement projects may require additional right-of-way.

2.2.2 Additional Criteria

- Pavement replacement includes the pavement treatments under the heading of "Pavement Replacement" in FDM 14-15-1 Table 1.2.
- Does not include increasing the number of driving lanes
- Does not include adding continuous lanes
- May include reconstruction not to exceed 50% of the length of the project
- No change to subgrade means the subgrade profile and cross slope are not changed
- May include continuous pavement widening or shoulder widening on rural highways
- May include subgrade widening on rural highways in order to widen pavement or shoulders without steepening sideslopes, or to accommodate increased pavement structure depth without steepening sideslopes, or to correct a structural problem
- May include improvement of an isolated grade, curve, intersection or sight distance problem to improve safety
- May include curb and gutter replacement to same line and grade
- May include replacement of curb and gutter in urban areas with up to 50% of new curb and gutter on new horizontal or vertical alignment.
- For urban roadways, may include removing up to 50% of existing aggregate, by the length of the

project, to accommodate increased pavement structure depth.
- For urban roadways, may include minor subgrade changes for up to 50% of project, by length, due to increased pavement structure depth.
- Does not include new storm sewer construction
- May include replacing sections of and/or expanding existing storm sewer systems
- May include transfer of width between pavement and shoulders
- May include shoulder paving
- May include adding or replacing sidewalks
- May include adding or replacing bikeways.

2.2.3 Examples

See FDM 14-15 Table 1.2.

- Pavement replacement plus re-grading of some individual horizontal or vertical curves
- Pavement replacement plus relocating parts of the project
- Pavement replacement plus continuously widening subgrade to allow pavement or shoulders to be widened along existing horizontal and vertical alignment
- Pavement replacement plus adding non-continuous (turning, climbing or passing) lanes
- Pavement replacement plus continuously or intermittently grading ditches and slopes to improve drainage or flatten vehicle recovery areas
- Pavement replacement plus adding parking lanes in urban areas.

2.2.4 Standards

- Interstate: FDM 11-44-1.
- Expressways and non-Interstate freeways: FDM 11-10-5, FDM 11-15-1., FDM 11-40-1 and FDM 11-40-8.
- Non-expressway/non-freeway facilities: FDM 11-40-1 and FDM 11-40-6.

2.2.5 FIIPS Improvement Concepts

Use the following improvement concept for this task:

- PVRPLA Pavement Replacement

2.3 Reconstruction

2.3.1 Definition

"Reconstruction" means total rebuilding of an existing highway to improve maintainability, safety, geometrics and traffic service. It is accomplished basically on existing alignment, and major elements may include flattening of hills and grades, improvement of curves, widening of the roadbed, and elimination or shielding of roadside obstacles. Normally, reconstruction will require additional right-of-way.

It includes rebuilding both the pavement structure and subgrade. It also includes widening of urban streets to widen lanes or to add parking, bicycle accommodations or auxiliary lanes, or adding sidewalks. Removing parking together with pavement replacement is in this category, because this increases the traffic carrying capacity of the roadway without actually constructing new through travel lanes.

2.3.2 Additional Criteria

- Work that either changes the location of the existing subgrade shoulder points or removes all of the existing pavement and base course for at least 50% of the length of the project.

2.3.3 Examples

- Re-grading to improve horizontal or vertical alignment for more than 50% of the length of the project.
- Replacing pavement structure and widening subgrade to widen lanes and/or shoulders.
- Upgrading existing interchanges (i.e., realigning or re-profiling ramps, lengthening ramp tapers, etc.)
- Adding continuous parking or auxiliary lanes
- Replacing existing urban pavement, curb and gutter and storm sewer
- Converting a rural roadway to an urban roadway with the same number of driving lanes.

2.3.4 Standards

- New construction standards in FDM 11-10-5 and FDM 11-15-1 or FDM 11-20-1.

2.3.5 FIIPS Improvement Concepts

Use the following improvement concepts for these tasks:

- RECST Reconstruction Preservation
- BRNEW New Bridge

2.4 Expansion

2.4.1 Definition

"Expansion" includes the same types of work associated with reconstruction, but also involves the construction of additional through travel lanes. In some cases, expansion may include construction of an entirely new street or highway on new alignment. Substantial land acquisitions may occur with these types of projects. Major projects are excluded from this definition.

2.4.2 Additional Criteria

- Same as Reconstruction
- Additional travel lanes may be either on existing or new location
- May or may not include rebuilding the existing roadway.
- Relocation, as used below, means changing the horizontal alignment sufficiently so that the old and new right-of-way are no longer contiguous.

2.4.3 Examples

- Relocating a roadway for more than 50% of the length of the project
- Adding one or more travel lanes for more than 50% of the length of the project
- Constructing a 2-lane or 4-lane community bypass
- Converting a rural 2-lane roadway to an urban roadway with four driving lanes
- Constructing new interchanges or adding lanes to existing interchange ramps.

2.4.4 Standards

- New construction standards in FDM 11-10-5 and FDM 11-15-1 or FDM 11-20-1.

2.4.5 FIIPS Improvement Concepts

Use the following improvement concepts for these tasks:

- RECSTE Reconstruction Expansion
- BRNEW New Bridge

2.5 Bridge Rehabilitation

2.5.1 Definition

"Bridge Rehabilitation" means the preservation or restoration of the structural integrity of an existing bridge as well as work to correct safety defects.

"Bridge Rehabilitation" includes repair, restoration or replacement of the components of the existing structure, including asphaltic surfacing or concrete overlays, as well as work to correct safety defects. Additional right-of-way will typically not be required, except minimal acquisitions may be necessary to accommodate ancillary improvements for drainage or for the construction of an abutment or pier.

2.5.2 Additional Criteria

- Includes widening of superstructure and substructure components
- Includes replacement of any superstructure component
- May include replacement of portions of abutments or piers

2.5.3 Examples

- Initial or replacement concrete or asphalt/membrane deck overlay
- Replace parapets with or without widening the deck
- Replace deck
- Replace deck and girders
- Widen deck and substructure units and add girders
- Replace or repair joints; replace delaminated concrete; strengthen structural steel by adding plates, re-welding or re-bolting

- Add fencing
- Raise deck to improve vertical clearance below

2.5.4 Standards

- Interstate: FDM 11-44-1
- All Other Highways: FDM 11-40-1

2.5.5 FIIPS Improvement Concepts

Use the following improvement concept for this task:

- BRRHB Bridge Rehabilitation

2.6 Bridge Replacement

2.6.1 Definition

"Bridge Replacement" means the building of a new bridge to replace an existing bridge.

The new bridge is either at the location of the existing structure or at a new location usually contiguous to the existing structure. A minor acquisition of additional right-of-way may be required.

2.6.2 Additional Criteria

- Includes replacement bridges with wider lanes and shoulders or additional lanes
- Includes eliminating grade separations and replacing with at-grade crossings
- Includes box culverts or a series of pipes wide enough to be classified as a bridge
- A bridge of any length or type may be replaced by any other

2.6.3 Examples

- Remove and rebuild a 2-lane bridge
- Replace a 2-lane bridge with a 4-lane bridge
- Replace a 4-lane bridge carrying counter directional traffic with a pair of bridges, each carrying traffic in a single direction.
- Replace a small bridge with a triple-cell box culvert 20' (6.0 m) long
- Remove a railroad/highway grade separation and install an at-grade crossing

2.6.4 Standards

- Interstate: FDM 11-44-1
- All Other Highways: FDM 11-15-1.

2.6.5 FIIPS Improvement Concepts

Use the following improvement concepts for these tasks:

- BRELIM Bridge Elimination
- BRRPLE Bridge Replacement Expansion
- BRRPL Bridge Replacement Preservation

FDM 3-5-5 Federally Funded Preventive Maintenance Projects

June 24, 2016

FDM 3-5-5 (Federally Funded Preventative Maintenance Projects) moved from 3-1-5 with no text additions or edits.

5.1 Introduction

Preventive Maintenance (PM) is the planned strategy of cost effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition and safety of the system without increasing structural or operational capacity. The work on a PM project must not degrade existing roadway geometrics or appurtenances.

The criteria used to develop the Streets and Highways agreement are based on guidance issued by FHWA on October 8, 2004, “Preventive Maintenance Eligibility”, http://www.fhwa.dot.gov/preservation/100804.cfm; and followed-up on September 12, 2005, “Pavement Preservation Definitions”, http://www.fhwa.dot.gov/pavement/preservation/091205.cfm); as well as current AASHTO guidance on Preventive Maintenance.

An agreement between WisDOT and the FHWA Wisconsin Division allows for the use of Federal-aid Highway

Funding for Preventive Maintenance activities as authorized in 23 USC 116 (d), "Preventive Maintenance" on all eligible Federal-aid highways in the State of Wisconsin. WisDOT and FHWA have signed two documents that allow for the use of federal funds for preventive maintenance activities:

1. *"Agreement for the use of Federal Funds for Preventive Maintenance of Streets and Highways*", (Exhibit 5.1), which is limited to Preventive Maintenance (PM) activities on roadways (except PM projects are not currently eligible on the local roads system). Preventive Maintenance on Structures is not covered by this agreement.
2. "*Agreement for the use of Federal Funds for Preventive Maintenance of Structures*", (Exhibit 5.2), which is limited to Preventive Maintenance (PM) activities on Structures. Limits for bridge preventive maintenance projects will include the bridge plus nominal approach roadway lengths on each end to include the bridge approach guardrail. Advance load posting signs beyond these limits may be included.

Federally-Funded Preventive Maintenance projects are a subprogram of the STH improvement program. Federally-Funded Preventive Maintenance projects are different than State Highway Rehabilitation Maintenance (SHRM) projects. Preventive Maintenance (PM) projects span the gap between routine maintenance and improvement projects. PM projects preserve and maintain existing roadways and structures and are not intended to upgrade or improve highway facilities, except as provided in the agreements.

Federal PM funding is only allowable for roads (except roads on the local roads system) and structures that are eligible for federal funding on the interstate, NHS and non-NHS systems.

In order to optimize the value of performing PM activities, combine the various types of preventive maintenance work needed to restore a given section of highway (or combined sections of highway and/or bridges) into one PM project whenever practical.

5.2 Requirements

PM work must meet all of the applicable requirements listed in the agreements, unless both WisDOT and FHWA agree to waive one or more of the requirements on a project. Document the waiver and agreement in the DSR for that project.

Review the agreements in Exhibit 5.1 and Exhibit 5.2 to determine whether the proposed work is eligible for federal PM funding, and the activities that are required on the PM project. The use of federal funds for PM work is limited to the eligible work types listed in the agreements, unless:

- A non-listed work type meets the eligibility requirements for PM, and
- WisDOT and FHWA both agree that it is eligible on a project. Document the work type and agreement in the DSR for that project.

The activities required on a PM project vary depending on the work type(s) used on that project.

5.2.1 Federal Aid Requirements and WisDOT Procedures

PM projects are WisDOT improvement projects. Work must follow all normal and applicable Federal Aid and WisDOT requirements and procedures, including, but not limited to, the following:

1. Planning – Project is in the State Transportation Improvement Program (STIP) and, if the project is located within the boundary of a Metropolitan Planning Area (MPA), in the Transportation Improvement Program (TIP) for that MPA.
2. Project Scoping
3. Complete Environmental Document, – See FDM Chapter 21 (FDM 21-5 Attachment 1.1 List of Projects Covered by the Programmatic Environmental Report)
4. Americans with Disabilities Act (ADA) Accessibility Guidelines (ADAAG) – See FDM 11-46-10, "Curb Ramps". Provide/update curb ramps per FDM 11-46-10, where applicable, if the work type is an "ADA Alteration" per "Department of Justice/Department of Transportation Joint Technical Assistance on the Title II of the Americans with Disabilities Act Requirements to Provide Curb Ramps when Streets, Roads, or Highways are Altered through Resurfacing", and its associated Glossary of Terms. Refer to Attachments 5.2 and Attachment 5.3. The original documents can be found at:

   http://www.fhwa.dot.gov/civilrights/programs/doj_fhwa_ta.cfm

   http://www.fhwa.dot.gov/civilrights/programs/doj_fhwa_ta_glossary.cfm
5. Transportation Management Plan (TMP) - See FDM 11-50-5, "Transportation Management Plan Process"

6. Plans, Specifications, & Estimates - See FDM Chapter 19
7. Pavement Design Report (PDR) – See FDM 14-15
8. Design Study Report (DSR) – See FDM 11-4-10 and FDM 11-4 Attachment 10.1; an Abbreviated Design Study Report is available for PM projects - See FDM 11-4 Attachment 10.2
9. Highway signing, pavement marking, traffic signals, Traffic Operations Infrastructure Plan (TOIP) items or highway lighting can be done as stand-alone projects using State Operations funding but NOT State Improvement funding. In order to use State Improvement funding, the total cost of these items must be incidental to the total project cost. DTIM defines "incidental" as:
   - Generally less than 10% of project cost (exceptions to this "10% guideline" will be considered if the activities are shown to provide significant safety benefits); and
   - Within the geographic limits of the improvement project or within reasonable proximity to the project limits.

   Eligible incidental items must make sense from an overall program priority perspective.

   Long-term operating costs associated with the activities and the Department's ability to absorb such costs should be considered in the evaluation of the request.

5.3 Preventive Maintenance on Streets and Highways - Eligible Work Types

See section III of the agreement in Exhibit 5.1 for types of PM work on streets and highways that are eligible for federal funds, Eligible work types on streets and highways fall into six (6) broad categories:

1. Group 1 Pavement Strategies
2. Group 2 Pavement Strategies
3. Group 3 Pavement Strategies
4. Drainage Restoration
5. Safety Appurtenances
6. Other

These are described in more detail below

The activities required on a PM project vary depending on the work type(s) used on that project. See section III of the agreement in Exhibit 5.1 for required activities on PM projects on streets and highways. See FDM 3-1-5.4 for guidance on required activities.

5.3.1 Pavement Preservation Strategies

FHWA defines a pavement preservation program as a network level, long-term treatments program that enhances pavement performance by using an integrated, cost-effective set of strategies to extend pavement life, improve safety and meet motorist expectations. A comprehensive pavement preservation program includes preventive maintenance, minor rehabilitation (non-structural) and routine maintenance activities. An effective pavement preservation program will address pavements while they are still in good condition and before the onset of serious damage (see section below, "Determining Pavement Condition").

There are three (3) groups of PM pavement preservation strategies:

1. Group 1 strategies consist of higher type construction with a longer expected life than either Group 2 or Group 3 strategies.
2. Group 2 strategies are relatively less expensive than Group 1 strategies and help to maintain the pavement in good condition. Group 2 strategies have a shorter expected life than Group 1 strategies and a longer expected life than Group 3 strategies.
3. Group 3 strategies involve less construction effort and have a shorter expected life than either Group 1 or Group 2 strategies.

Confer with the region pavement design engineer on the appropriate strategy to use.

Note: Pothole filling is routine maintenance and not eligible for preventive maintenance.

Determining Pavement Condition

Preventive maintenance treatments are applied to pavements or structures in good condition having significant remaining service life. Preventive Maintenance treatments are usually not cost effective on a structurally

deficient pavement or structure because they do not satisfactorily address structural deficiencies. As a major component of pavement preservation, preventive maintenance is a strategy of extending the service life by applying cost-effective treatments to the surface or near-surface of structurally sound pavements.

A "good condition" pavement that is a viable PM/PP candidate can generally be defined as a pavement in which the dominant distress types present are expected pavement surface distress manifestations of age and environmental stress factors – typically temperature cracking and perhaps some surface wear, and spalling. Viable PM/PP candidates in good to very good condition would have little, if any, structural distresses; hence, these pavements can be classified as structurally sound pavements.

The Pavement Condition Index (PCI) Number is an indicator of pavement condition (see Program Management Manual Document No. 03-05-05, "*State Improvement Programs - State Highway Rehabilitation, State 3R/Low Cost Bridge Program - Program Development*", http://dotnet/pmm/03/03-05-05e.pdf (WisDOT staff only) for a description of PCI. PCI data will be included in Meta-Manager data in place of the "Pavement Distress Index" (PDI) rating).

Due to the numerous combinations of pavement distresses that can occur simultaneously, it is not foolproof to define "good" condition pavement solely by a Pavement Condition Index (PCI) Number. However, PM/PP projects would very likely have a PCI >65, and in the majority of cases, the PCI would likely be greater than 75. Confer with the Program Development and Analysis Section of DTIM's Bureau of State Highway Programs (BSHP) and with the region pavement design engineer.

Provide documentation in the project DSR of the pavement condition.

Determining if pavement treatment qualifies as a capital improvement

Several of the Group 2 and Group 3 strategies are only eligible as preventive maintenance if they are capital improvements, i.e., there is an appreciable extension to the capital life of an asset. This means that the treatment must have a rehabilitation effect on the pavement and extend the service life of the pavement by four (4) years or more. Again, confer with the Program Development and Analysis Section of DTIM's Bureau of State Highway Programs (BSHP) and with the region pavement design engineer.

Provide documentation in the project DSR that the treatment qualifies as a capital improvement.

5.3.1.1 Group 1 Pavement Preservation Strategies

Group 1 Pavement Preservation Strategies are:

- Resurfacing
- Milling and resurfacing
- Portland cement concrete (PCC) dowel bar retrofitting with diamond grinding

Resurfacing is eligible for preventive maintenance (PM) subject to the following:

- A maximum of 2 inches of new asphalt pavement can be placed, including all leveling and wedge courses, unless correcting cross slope deficiencies, and
- If the existing lane width and finished shoulder width have not been reduced from those that were built under new construction / reconstruction and the sideslopes contiguous with the finished shoulder are 4:1 or flatter then the new surface can be a maximum of 2 inches above the existing profile at the shoulder point. Otherwise, the new surface cannot be raised above the existing profile at the shoulder point.

Additional pavement thickness is allowed in the middle of a pavement section to correct for cross slope deficiencies. For example, correcting a cross-slope from 1.5% to a 2.0% over a 12-foot lane will increase the overlay thickness in the middle to about 2.75 inches while thickness at the edge of pavement is 2 inches (see Attachment 5.1).

Preventive Maintenance overlays projects need to maintain existing usable shoulder widths and recoverable slopes within the clear zone. There is not an issue with usable shoulder width or recoverable slopes for 2-inch overlays if the existing sideslope is 6:1. If the existing sideslope is 4:1 then the 2-inch maximum overlay can still be used on a roadway with a 6-foot or greater finished shoulder width, but the shoulder cross-slope will need to be steepened (use 6% MAX).

5.3.1.2 Group 2 Pavement Preservation Strategies

Group 2 Pavement Strategies are:

- Asphaltic patching – full depth
- PCC joint restoration

- PCC patching – full depth
- PCC cross-stitching
- Shoulder restoration/paving
- Paved shoulder addition
- Diamond grinding

Asphaltic patching-full depth, and PCC patching–full depth are not eligible for PM if performed as routine maintenance of random or isolated spot locations. However, combining locations to establish a reasonable sized project is eligible.

Asphaltic patching-full depth, PCC joint restoration and PCC patching–full depth are only eligible for preventive maintenance (PM) if they can be shown to be capital improvements (see guidance in FDM 3-1-5.3.1 for determining if work qualifies as a capital improvement).

Paved shoulder can be added if:

- It is consistent with the guidance in FDM 11-15-1 (there is a bicycle provision that references FDM 11-45-10 in this procedure), and
- It does not increase the total finished shoulder width, and
- It does not steepen the side slope at all.

5.3.1.3 Group 3 Pavement Preservation Strategies

Group 3 Pavement Strategies are:

- Milling
- Rut filling
- Seal coating
- Micro-surfacing
- Crack filling

Group 3 Pavement Preservation Strategies are not eligible for PM if performed as routine maintenance of random or isolated spot locations. However, combining locations to establish a reasonable sized project is eligible.

In addition, three of the Group 3 Pavement Preservation Strategies - Seal coating, Micro-surfacing, and Crack filling - are only eligible for preventive maintenance (PM) if they can be shown to be capital improvements (see section 5.3.1, “Determining if pavement treatment qualifies as a capital improvement”).

5.3.2 Drainage Restoration

Roadway drainage maintenance focuses on retaining the intended design efficiency of the drainage system. Good roadway drainage maintenance maintains roadway safety and increases the life of the pavement. A well maintained foreslope helps a driver bring a vehicle under control with minimum damage if it leaves the roadway. Cleaning roadside ditches maintains hydraulic efficiency and prevents standing water. Well-maintained embankment slopes and culvert ends minimize the potential to trip a vehicle that runs off the road and passes over the culvert end.

Drainage restoration work types are:

- Ditch restoration
- Storm drain restoration
- Culvert pipe restoration/replacement
- Traversable Grates
- Culvert pipe liners
- Box culvert restoration

Ditch restoration

Ditch restoration means restoring the originally designed and constructed alignment, grade profile, depth, and cross section of the ditch. Ditches within the clear zone shall be traversable, if possible (see FDM 11-15 Attachment 1.11). For paved ditches, patch and repair breaks, seal open cracks, and correct settlement.

Storm drain restoration

Storm drain restoration means restoring the structural integrity, hydraulic efficiency and hydraulic capacity of existing storm inlets.

Culvert pipe restoration

Culvert pipe restoration means restoring the geometrics (line and grade), structural integrity, hydraulic efficiency and hydraulic capacity of existing culvert pipes, including inlet and outlet structures.

Culvert pipe replacement

Culvert pipe replacement means removing an existing pipe culvert and replacing it with a new pipe culvert at the same general location. It does not include box culvert replacement.

Traversable Grates

Traversable Grates means installation of a bar-grate or pipe-grate at the end of an existing culvert, or its apron endwall, that is traversable by vehicles (see AASHTO Roadside Design Guide [1]). This also includes sloped endwalls per SDD 8F7 and SDD 8F8.

Consider the headloss associated with the grates when adding traversable grates to culverts or apron endwalls.

Culvert pipe liners

Culvert pipe liners means restoring an existing pipe culvert by inserting a liner.

Consider the effect of a proposed culvert liner on the water surface profile, particularly in a mapped floodplain. The smaller size of a culvert liner relative to the existing culvert can result in a raised water surface profile,

Also, carefully evaluate the impact of a proposed culvert liner on the passage of aquatic organisms. For example, because a culvert liner fits inside an existing culvert, the invert elevations will be higher. This might obstruct the passage of aquatic organisms. Also, the smaller size of a culvert liner relative to the existing culvert can result in greater velocity, which might hinder the passage of aquatic organisms.

Box culvert restoration

Box culvert restoration means restoring the geometrics (line and grade), structural integrity, hydraulic efficiency and hydraulic capacity of existing concrete box culverts, including inlet and outlet structures. It does not include box culvert replacement.

Confer with the Bureau of Structures (BOS).

5.3.3 Safety Appurtenances

Safety Appurtenance work types are:

- Beamguard/cable guard restoration/ installation/upgrading
- Terminal End upgrading
- Highway signing restoration/ installation/upgrading
- Pavement marking restoration/upgrading
- Traffic signal restoration/upgrading/ retiming
- Highway lighting restoration/upgrading
- Railroad Crossing Warning Device restoration/upgrading

Beamguard/cable guard restoration/ installation/upgrading and Terminal End upgrading

Restoration means restoring an existing barrier's geometry and hardware to current standards per FDM 11-45-2, and applicable SDD's or other details. Restoration can include line and grade, height, galvanization, hardware, block outs, posts and post foundations, tensioning, terminals, grading, shaping, finishing, and replacement/repair of damaged components. Upgrade existing barrier if it cannot be restored to current standards.

Installation means installing new barrier that meets current standards, and includes extending existing barrier. Extend existing barrier if it does not meet current standards for length of need (LON) (see FDM 11-45-2). Restore or upgrade existing barrier to current standards before extending it.

Upgrading means removing an existing sub-standard barrier or terminal and replacing it with a barrier or terminal that meets current standards.

Beamguard/cable guard restoration/ installation/upgrading and Terminal End upgrading are not eligible as a standalone PM project for routine maintenance of random or isolated spot locations. This work is eligible as a standalone PM project if several locations are combined to establish a reasonable sized project.

[1] AASHTO Roadside Design Guide, 3rd edition, 2006, sect. 3.4.2.1, "Traversable Design"

Highway signing restoration/ installation/upgrading

[2]*Restoration* means work to restore the proper function of a highway sign. This includes:

- Repair or replace damaged signs
- Assure that all signs are in proper position and legible,
- Assure that all signs are mounted on an adequate support and at proper height,
- Maintain night visibility of reflectorized and illuminated signs,
- Assure that signs are fully visible to traffic. If needed, remove, or arrange for removal or control of, brush or other vegetation that may obscure the sign. It may also be necessary to alter placement of a sign to assure that motorists can easily see and read the sign.
- Clean or wash signs that are dirty to improve visibility,
- Assure that the breakaway mechanism on sign supports is operating properly, and that bolts are properly tensioned to avoid unwanted breakaway.

Highway signing restoration is not eligible as a standalone PM project for routine maintenance of random or isolated spot locations, even if several locations are combined. Highway signing restoration is eligible as a standalone PM project (but still subject to the WisDOT funding restrictions noted in Section 5.2.1) if done along substantial section lengths, or area and corridor wide segments.

Installation means installing new highway signs that meet current standards

Upgrading means removing existing sub-standard signs and replacing them with signs that meets current standards.

Confer with the Region traffic engineer. See on-line manuals at the Highway Operations manuals library:

http://wisconsindot.gov/Pages/doing-bus/local-gov/traffic-ops/manuals-and-standards/manuals.aspx

Also, see FDM 15-1-20.10.

Pavement marking restoration / upgrading

Restoration means replacing existing pavement marking that has been obscured or obliterated by the preventive maintenance pavement treatment, or that shows unacceptable levels of discoloration, chipping, substrate exposure, or inadequate reflectivity

Pavement marking restoration is not eligible as a standalone PM project for routine maintenance of random or isolated spot locations, even if combining several locations. Pavement marking restoration is eligible as a standalone PM project (but still subject to the WisDOT funding restrictions noted in Section 5.2.1) if done along substantial section lengths, or area and corridor wide segments.

Upgrading means removing existing sub-standard pavement markings and replacing them with pavement-markings that meets current standards.

Confer with the Region traffic engineer. See on-line manuals at the Highway Operations manuals library:

http://wisconsindot.gov/Pages/doing-bus/local-gov/traffic-ops/manuals-and-standards/manuals.aspx

Also, see FDM 15-1-20.13, standard spec 646 and standard spec 647, and SDDs for pavement marking in FDM Chapter 16.

Traffic signal restoration /upgrading/ retiming

Confer with the Region traffic engineer.

Traffic signal work is subject to the WisDOT funding restrictions noted in Section 5.2.1.

Highway lighting restoration/ upgrading

Confer with the Bureau of Traffic Operation's Electrical Engineering Section.

Highway lighting work is subject to the WisDOT funding restrictions noted in Section 5.2.1.

Railroad Crossing Warning Device restoration / upgrading [BRH - Mark Morrison]

Confer with the Region railroad coordinator

[2] Adapted from Oregon DOT *Maintenance Guide (2004), ch. 15: Maintenance Activities,* Activity 143, "Minor Sign Installation Maintenance"

5.3.4 Other

Shoulder rumble strips

See SDD 13A5 for construction detail of shoulder rumble strips. The addition of shoulder rumble strips must be consistent with the guidance in FDM 11-15-1.

Erosion prevention/slope restoration

See FDM Chapter 10 for guidance on erosion control.

Slope restoration means restoring, as near as practical, the cross section to which the slope was originally designed and constructed or was subsequently reconstructed.

Clear zone restoration (tree/shrub removal)

Remove vegetation within the clear zone that can reasonably be expected to exceed 4-inches in diameter at maturity, or clumps of trees or bushes that may act as a single tree of 4-inches or more in diameter.

Clear zone is defined per 3R and 4R design standards. See FDM 11-40-1, FDM 11-40-2, and FDM 11-44-1.

Rip-rap restoration or addition

See FDM 10-10-19 and FDM 13-30-10 for guidance on riprap.

Curb, gutter, sidewalk restoration

See FDM 11-46-10 for ADA and curb ramp requirements.

This work does not include routine maintenance of random or isolated spot locations. Combining locations to establish a reasonable sized project is eligible.

Edge drop-off mitigation:

A vertical drop-off at the edge of travel lane or at the edge of paved shoulder is hazardous. It usually occurs as a result of the subsistence of the abutting gravel shoulder, and corrected by replenishing and re-grading the gravel.

Another technique that other states have used successfully is the asphalt wedge, or safety-edge. WisDOT will employ this technique on a pilot basis. It is also possible to use this technique in conjunction with gravel shoulder restoration.

Traffic Operations Infrastructure Plan (TOIP) items

See Program Management Manual Document 06-10-45 for additional information and programming considerations for TOIP items. Consult with DTSD Bureau of Traffic Operations (BTO) and with DTIM Bureau of State Highway Programs (BSHP).

TOIP-related improvements may be fully funded with maintenance and operations funds, but must be incorporated into larger improvement projects if improvement funds are to be used. Under current state statutes, “the installation, replacement, rehabilitation, or maintenance of highway signs, traffic control signals, highway lighting, pavement, markings, or intelligent transportation systems” cannot legally use SHR improvement funds unless they are “incidental” to an improvement project.

5.4 Preventive Maintenance on Streets and Highways - Activities

The activities required on a PM project vary depending on the work type(s) used on that project. Required activities can include the following:

1. Crash Information and Safety Improvements Evaluation
2. Capacity Evaluation
3. Guardrail Assessment / Upgrades
4. Clear Zone Restoration
5. Signing and Marking Upgrades
6. Median Crossover Side Slope Regrading
7. Railroad Crossing Safety Review

5.4.1 Crash Information and Safety Improvements Evaluation

Crash Information and Safety Improvements Evaluation is only required for PM projects on which either a Group

1 or a Group 2 Pavement Preservation Strategy is used.

The evaluation requires a Safety Screening Analysis (SSA) per FDM 11-1-4. A full Safety Screening Analysis (SSA) is required for PM projects on which a Group 1 Pavement Preservation Strategy is used. An abbreviated SSA is required for PM projects on which a Group 2 Pavement Preservation Strategy is used.

An abbreviated SSA requires the following:

- Do step 1 of the SSA as described in FDM 11-1-4
- If there are Improvement Flags with a level of problem (LOP) >=10 then complete steps 2 & 3 of the SSA.
- If there are no Improvement Flags with a LOP >=10 then the SSA is satisfactorily completed and the project development continues.

A PM project may still include segments with Crash Flags or Improvement Flags or sub-standard features that are not eligible for a programmatic exception to standards, even though correcting these segments is not included in the PM project because it is not eligible as PM work. Address these segments as follows:

- Incorporate operational improvements into the PM project at those spot/segment locations that are consistent with the scope of the preventive maintenance work and appropriate based on the analysis of crash types. Use measures listed in FDM 11-40 Attachment 1.1, “Alternatives to Reconstruction to Enhance Safety”, or other proven measures that are acceptable to FHWA, WisDOT Bureau of Project Development (BPD), WisDOT Bureau of Highway Maintenance (BHM) and WisDOT Bureau of Traffic Operations (BTO).
- Document in the PM project DSR that construction is required for safety improvements or to correct sub-standard features. The region will either consider this construction for HSIP funding or address this construction with future programming. The PM project may proceed without delay.

Document the SSA in the DSR for the PM project per FDM 11-1-4, except the special documentation for National Highway System (NHS) routes is not required for an Abbreviated SSA if step 1 did not identify any Improvement Flags with LOP >=10.

Although allowed, continuing with a PM project and deferring construction for improvement flags and substandard features to another project may not be the best approach. A safety issue or sub-standard feature may be bad enough that it requires immediate attention. If a non-PM project is done shortly after a PM project then some of the PM construction will be “thrown away”. It may be more cost-effective to exclude these segments from the PM project, or it may be possible to let the PM project in conjunction with the non-PM project. Coordinate with FHWA on the best way to handle improvement flags and substandard features on Interstate, NHS, and Federal long truck routes.

Formal Exception to Standards

It is not necessary to request a formal exception to standards per FDM 11-1-2 on a PM project because it has no effect on a PM project’s scope. Many PM eligible work types do not require the identification of substandard features, and those that do have a provision for deferring correction to another project. Also, it is extremely unlikely that correcting a substandard controlling feature within a PM project’s limits would be part of a PM project because the construction would not be eligible as PM work. Work needed to correct the deficiency would have to be part of a non-preventive maintenance project anyway.

Do not use impacts to a PM project as justification for an exception to standards because the relative low cost of PM treatments would distort the evaluation. Only justify an exception to standards based on the long term impacts of perpetuating a deficiency vs. the impacts of correcting it.

5.4.2 Capacity Evaluation

FHWA and WisDOT recognize the importance of system preservation but also require that roadways have adequate capacity. The projected capacity needs can be no less than one Level of Service (LOS) grade below the required LOS Grade per FDM 11-5-3 within 10 years of the date of construction (see FDM 11-5-3 for acceptable capacity calculation methods). FHWA pre-approval is required if the LOS is not acceptable within this period.

For example, if a Region is planning to resurface a section of rural interstate in 2010, the projected LOS 10 years after construction in 2020 must be at least LOS D; highways in urban areas with populations greater than 250,000 such as Milwaukee County need to be LOS E 10 years after construction to be eligible for Federal Preventive Maintenance.

Capacity Evaluation is only required for PM projects on which a Group 1 Pavement Preservation Strategy is used. Document this determination in the Design Study Report for the PM project.

5.4.3 Guardrail Assessment / Upgrades

The following minimum upgrades are required, per Exhibit 5.1, if this activity is included in a PM project:

- Upgrade guardrail and end treatments to current standards*. Eliminate all blunt end and turndown guardrail sections.
- Ensure that damaged guardrail elements, as defined in FDM 11-45-1, are repaired or replaced.
- Adjust rail height of guardrail to meet the criteria in FDM 11-45-1.
- Upgrade all guardrail transitions to fixed objects to meet criteria in FDM 11-45-1.
- Upgrade guardrail installations with 12'-6" post spacing or with no block-outs.
- Remove strong-post cable guard installations, replace with compliant barrier if needed.

* Note: Current standards mean both hardware and geometric standards, including grading requirements, working width and length of need (LON).

Guardrail assessment and upgrades are required on PM projects with the following work types:

- Group 1 Pavement Preservation Strategies
- Group 2 Pavement Preservation Strategies if the guardrail, within the PM project limits was installed more than twenty (20) years before the PS&E date of the PM project.
- Safety Appurtenances, Beamguard/cable guard restoration/installation/upgrading
- Safety Appurtenances, Terminal End upgrading

Guardrail assessment, per guidance in FDM 11-45-2, is required as part of the PM project. If an assessment was done as part of a previous project, then update that assessment. Document the assessment and the needed construction in the DSR for the PM project.

For Pavement Preservation PM Projects, the construction work may either be included in the PM project or be included as part of another improvement project. If the construction is not included in the PM project then the region will address the needed construction with future programming. For Beamguard/cable guard restoration/installation/upgrading or Terminal End upgrading PM projects, the construction is included in the PM project.

5.4.4 Clear Zone Restoration

Remove vegetation within the clear zone that can reasonably be expected to exceed 4 inches in diameter at maturity, or clumps of trees or bushes that may act as a single tree of 4-inches or more in diameter. Clear zone is defined per 3R and 4R design standards. See FDM 11-40-1, FDM 11-40-2, and FDM 11-44-1.

Clear Zone Restoration is required on PM projects with the following work types:

- Group 1 Pavement Preservation Strategies
- Group 2 Pavement Preservation Strategies
- Safety Appurtenances, Beamguard/cable guard restoration/ installation/upgrading if there is vegetation in the vicinity
- Safety Appurtenances, Terminal End upgrading if there is vegetation in the vicinity
- Other, Erosion prevention/slope restoration for work within the clear zone
- Other, Clear zone restoration (tree/shrub removal);

An assessment of whether clear zone restoration is needed is required as part of the PM project. Document the assessment and the needed construction in the DSR for the PM project.

For Pavement Preservation PM Projects, the construction work may either be included in the PM project or be included as part of another improvement project. If the construction is not included in the PM project then the region will address the needed construction with future programming. For non-pavement preservation PM projects, the construction is included in the PM project.

5.4.5 Signing and Marking Upgrades

Replace all permanent signs within the PM project limits. Remove vegetation obscuring any highway signing. Upgrade deficient pavement marking.

Coordinate with the region traffic engineer. See FDM 15-1-20 and applicable manuals from the Highway Operations manuals library:

http://wisconsindot.gov/Pages/doing-bus/local-gov/traffic-ops/manuals-and-standards/manuals.aspx

Signing and Marking Upgrades are required on PM projects with the following work types:

- Group 1 Pavement Preservation Strategies
- Group 2 Pavement Preservation Strategies
- Drainage Restoration, but only to replace missing culvert delineator posts
- Safety Appurtenances, but only for work involving signing or pavement marking

An assessment of whether signing and marking upgrades are needed is required as part of the PM project. Document the assessment and the needed construction in the DSR for the PM project.

For Pavement Preservation PM Projects, the construction work may either be included in the PM project or be included as part of another improvement project. If the construction is not included in the PM project then the region will address the needed construction with future programming. For non-pavement preservation PM projects, the construction is included in the PM project.

Signing and Marking Upgrades **are not required** on Group 3 Pavement Preservation Strategies PM projects. Pavement marking restoration is required for pavement markings that are disturbed / obliterated by the Group 3 pavement treatment. The reasons for not requiring signing & marking upgrades on Group 3 pavement strategies are:

- When Group 3 pavement strategies are applied early in the pavement life cycle, most signing should still be in good condition, and marking may still be in good condition.
- The work can easily exceed 10% of the project, i.e., it would not meet the requirement for incidental construction discussed in Section 5.2.1.

5.4.6 Median Crossover Side Slope Regrading

Flatten median crossover side slopes that are steeper than 6:1 to meet current design standards (see SDD 11a1)

Median Crossover Side Slope Regrading is required on PM projects with the following work types:

- Group 1 Pavement Preservation Strategies
- Group 2 Pavement Preservation Strategies
- Drainage Restoration, for Culvert replacement if the culvert being replaced is under a median crossover
- Safety Appurtenances, for Beamguard/cable guard restoration/installation/upgrading or Terminal End upgrading if a median crossover location coincides with the location of the barrier work
- Other, for Slope restoration

An assessment of whether median crossover side slope regrading is needed is required as part of the PM project. Document the assessment and the needed construction in the DSR for the PM project.

For Pavement Preservation PM Projects, the construction work may either be included in the PM project or be included as part of another improvement project. If the construction is not included in the PM project then the region will address the needed construction with future programming. For non-pavement preservation PM projects, the construction is included in the PM project.

5.4.7 Railroad Crossing Safety Review

Consult with the Region railroad coordinator about the requirements for both the safety review and construction.

A *Railroad Crossing Safety review* is only required on PM projects with the following work types:

- Group 1 Pavement Preservation Strategies - The safety review is required as part of the PM project Update safety reviews done as part of a previous project. Construction work may either be included in the PM project or be included as part of another improvement project. If the construction is not included in the PM project then the region will address the needed construction with future programming.
- Railroad Crossing Warning Device restoration/upgrading - Both the safety review and construction work are included in the PM project. Update safety reviews done as part of a previous project.

Document the safety review and the needed construction in the DSR for the PM project.

5.5 Preventive Maintenance on Structures

Coordinate with the Bureau of Structures.

LIST OF ATTACHMENTS

FDM 3-5 Attachments 5.1 to 5.3 and Exhibits 5.1 and 5.2 moved from FDM 3-1 Attachments 5.1 to 5.3 and Exhibit 5.1 and 5.2. No text additions or edits were added.

Attachment 5.1	Allowable Overlay on Existing 2% Cross Slope
Attachment 5.2	DOJ/DOT Joint Technical Assistance on the Title II of the Americans with Disabilities Act Requirements to Provide Curb Ramps when Streets, Roads or Highways are Altered through Resurfacing
Attachment 5.3	Glossary of the Terms for DOJ/FHWA Joint Technical Assistance on the ADA Title II Requirements to Provide Curb Ramps when Streets, Roads or Highways are Altered through Resurfacing

LIST OF EXHIBITS

Exhibit 5.1	Agreement for the Use of Federal Funds For Preventive Maintenance of Streets & Highways (Except Structures)
Exhibit 5.2	Agreement for the Use of Federal Funds For Preventive Maintenance of Structures

FDM 3-5-10 Force Account Agreements *January 13, 2017*

FDM 3-5-10 (Force Account Agreements) is the combination of former subsections FDM 3-1-3 (State Force Account and Local Force Account Agreements), FDM 3-20-11 (Force Account Agreements), and FDM 3-20-12 (Cost Effectiveness Findings). Revised text is shown in red.

10.1 Introduction

Although WisDOT policy is to let construction contracts through a competitive bidding process, under special circumstances the department may enter into an agreement directly with local governments, railroads, and utilities for the performance of construction work. Several types of "force account" agreements are used to this end and they are discussed in this procedure. (Note: the “force account” agreements discussed below are different than the Force Account work described in Section 2.46 of the Construction and Materials Manual.)

10.2 Wisconsin Statutes

The statutory basis for WisDOT's policy to let contracts through bidding lies within Section 84.06(2) which states in part:

> *"All such highway improvements shall be executed by contract based on bids unless the department finds that another method as provided in sub. (3) or (4) would be more feasible or advantageous."*

Subsection (3) allows the department to forgo the bidding process and enter into an agreement directly with local governments by stating in part:

> *"If the department finds that it would be more feasible and advantageous to have the improvement performed by the county in which the proposed improvement is located and without bids, the department may, by arrangement with the county highway committee of the county, enter into a agreement satisfactory to the department to have the work done by the county forces and equipment."*

The same allowance is made for cities, towns and villages:

> *"The provisions of this subsection relating to agreements between a county and the state shall also authorize and apply to such arrangements between a city, town or a village and the state."*

Utilities and railroads may also enter into a force account agreement with the state as allowed by Subsection (4) which states in part:

> *"If an improvement undertaken by the department will cross or affect the property or facilities of a railroad or public utility company, the department may, upon finding that it is feasible and advantageous to the state, arrange to perform portions of the improvement work affecting such facilities or property or perform work of altering, rearranging or relocating such facilities by agreement with the railroad or public utility. Such agreement shall be between the railroad company or public utility and the state and need not be based on bids."*

10.3 Types of Force Account Agreements

The department has developed several agreement types for the administration of the force account agreements

allowed by 84.06 (3) & (4). The type of agreement to be used for a particular project is primarily dependent on the organization performing the work. Other criteria of interest are the funding program and the jurisdictional system on which the work will be done. These considerations are outlined in the following table.

Table 10.1 Agreements

Type of Agreement	System	Funding Source	Funding Program
STATE FORCE ACCOUNT	STH	Fed/State	Any
LOCAL FORCE ACCOUNT (on the STH system)	STH	Fed/State/Local	Any
LOCAL FORCE ACCOUNT (on the local system)	LOCAL	Fed/State/Local	STP/HES/BR/CMAQ/TE
Utility Agreement	Any	Any	Any
Railroad Agreement	Any	Any	Any

10.3.1 State Force Account and Local Force Account (State System) Agreements

A State Force Account (SFA) agreement is used when the department performs work on the State Trunk Highway System with its own forces and equipment and the work is funded under an improvement project. Local Force Account (State System) agreements are used when a local unit of government does work for the department on the State Trunk Highway System.

The type of work associated with SFA projects is generally traffic, safety or other minor roadway related items such as traffic signals, signing, pavement marking, lighting and guardrail. The work is funded with federal or state funds. It is typically low cost and can be done by state, county or local forces with minimal plan detail and with only short lead-time

10.3.2 Local Force Account Agreements (Local System)

Local Force Account (LFA) agreements are used when a local unit of government does work on their own local highway system. Local units cannot use Federal-aid funds to have another local unit perform construction work on their own system. Under these agreements the locals are reimbursed for the actual costs incurred in performing the work up to an agreement maximum (as amended by any change orders); however, the labor, material, and machinery rates are projected in advance and must be determined to be cost effective. These agreements are to be based on the actual cost required to perform the work so that they cannot result in profit or loss for the unit of government performing the work. Any state, local or federal funding program for which the project is eligible may be used with this agreement type.

The type of work associated with LFA (Local System) will typically be limited to locally maintained traffic signal, lighting, signing, pavement markings, guardrail and utility work related to WisDOT improvement projects that can't be accommodated through the project letting or utility adjustment processes. Very narrow LFA exceptions may be made at WisDOT discretion; decisions will be made by on a case by case basis.

10.3.3 Utility & Railroad Agreements

Utility (UTL) and railroad (RR) agreements are used when railroad companies or public utilities perform portions of road improvement work that affect their facilities, or work to alter or relocate their facilities. Any available funding source may be used for these agreements and the work may be done on any jurisdictional system.

These types of agreements have been deemed to be in the public interest by definition and need not be justified on an individual project basis.

10.4 Policy Regarding Agreements

If a municipality (county or other unit of local government) wishes to construct a highway project with its own work force and equipment, it must comply with the Wisconsin Department of Transportation's "A Policy on Construction of State and Federal-Aid Highway Projects by Forces and Equipment of Counties or Other Local Governmental Units." The policy has been written to define WisDOT's position, regarding non-competitive bid agreements (force account agreements) with municipalities. The policy establishes general procedures and criteria for entering into force account agreements.

This policy is shown in Attachment 10.1.

This policy also defines the items necessary to show a force account agreement with a local unit of government is cost effective. FDM 3-5-10.9 describes how a Cost Effectiveness Finding is developed as well as other cost

documentation for a force account agreement.

10.4.1 Contracted Work (Federal Funded)

Municipalities that wish to perform work with their own forces on their own system using federal funds must be "adequately staffed and suitably equipped" to undertake and satisfactorily complete the work. "Adequately staffed" means that all work must be completed by the municipality itself (unless let via a competitive contract). If the municipality requires assistance from a contractor, then by definition, they do not have adequate forces to complete the work.

10.5 Project Oversight Requirements for Components of Project Listed in State/ Municipal Agreement (Local System)

As noted above, portions of a project may be federally funded and other portions may be entirely locally funded. Development oversight as defined in this Facilities Development Manual by the MC or other consultant is required for all federally funded components of work performed.

10.6 Development Oversight (Local System)

Environmental: The entire project must meet NEPA requirements Purchase of Real Estate: Real estate purchased for the project must follow the process per the Uniform Act.

Design Standards: LFA project development must follow the regulatory standards (for town road, as outlined in TRANS 204, for county roads, as outlined in TRANS 205), and appropriate guidance as outlined in FDM 11-40 for 3R projects as applicable.

10.6.1 Project Development

Regions are responsible for developing SFA or LFA projects on the state system. Local Units of Government are responsible for developing LFA projects on their local system. A PS& E will not be prepared for submittal to the central office for any SFA project or for state funded LFA projects. A PS&E is required for all federally funded LFA projects. The process to follow is summarized in Table 10.2. The details of the LFA and the PS&E procedure, when required to be submitted to Central Office, are contained in FDM 19-25-5.

Table 10.2 SFA/LFA Development Process

	Action Required		
Project Type & Size	**PS&E to C.O.**	**Agreement & DT25 to C.O.**	**Agreement Execution by Region**
SFA	No	No	Yes
LFA≤ $5,000	No	No	Yes
LFA>$ 5,000 (Local)	Yes	Yes [1]	No
LFA>$5,000 (State)	Yes	Yes	No

[1] DT25 not required for CMAQ or TE projects.

SFA and LFA projects that have certain levels of involvement (include signals, lighting, electrical work, etc.) should be coordinated with the appropriate region staff and/or central office bureau (refer to Table 10.3).

Table 10.3 Region Staff and/or Central Office Bureau Coordination Contacts

Project Involvement	Manual Reference	Region Contact	Central Office Contact
Design Standards	FDM - Chapter 11	Project Development Section or LPMC	DTSD/BPD - Project Services Section or Local Project Delivery Section
Environmental Documentation	FDM - Chapters 20 - 26	Region Environmental Coordinator, LPMC	DTSD/BTO) - Environmental Process & Documentation Section
Real Estate Acquisition	Real Estate Program Manual	TS Section, Real Estate Services Unit, LPMC	DTSD/BTO - Acquisition & Services Section
Structures	Bridge Manual	NA, LPMC	DTSD/BOS
Lighting, Signals, Electrical Work	Traffic Guidelines Manual - Chapters 4 and 11	Traffic Systems and Management, Traffic Systems Unit, LPMC	DTSD/BTO
Signing	Traffic Guidelines Manual - Chapters 2	Traffic Engineering and Safety, Traffic Design Unit, LPMC	DTSD/BTO
Railroads	FDM - Chapter 17	Region Railroad Coordinator, LPMC	DTIM/BTLRRH - Rails and Harbors Section
Utility Coordination	FDM - Chapter 18	Region Utility Coordinator, LPMC	DTSD/BTO - Acquisition Section, Utility and Access Unit

DTSD = Division of Transportation System Development

BPD = Bureau of Project Development

BOS = Bureau of Structures

BTO = Bureau of Traffic Operations

DTIM = Division of Transportation Investment Management

BTLRRH = Bureau of Transit, Local Roads, Rails, and Harbors

LPMC = Local Program Management Consultant

10.7 Documentation for LFA < $5,000 and State-Funded LFA > $5,000

If a project does not require a PS&E to be submitted to central office then the region shall keep a project folder with the following items and complete the actions listed below.

1. Project concept and estimate. The subject project may be part of a larger improvement project or it may be a stand-alone project. If it is a stand-alone project, the region will submit either a separate Concept Definition Report and Design Study Report or they may submit a combination Concept Definition Report / Design Study Report. Send an informational copy to the Project Services Section in the Bureau of Project Development (BPD). The DSR format (FDM 11-4 Attachment 10.1) needs to be reviewed and those items that apply to the project need to be addressed. Include a statement identifying the environmental action, which would normally be a Categorical Exclusion or programmatic Environmental Report.

2. A cost effectiveness finding is required to justify doing the work with state, county or local forces. If over $50,000, prepare a cost effectiveness finding and submit it in accordance with FDM 3-5-10.9. The analysis needs to be only as detailed as necessary to show that it will cost less to do the work with state, county or local forces than with private forces. If the project is $50,000 or less, the finding is programmatic and no cost comparison is prepared. Just document in the project folder that the project meets the programmatic criteria for cost effectiveness. For LFAs less than $50,000 include the Justification for Negotiated Agreements $50,000 or less form, Attachment 10.4. Indicate the results of the cost effectiveness finding on form DT25, “Recommendation to Governor for Contract and Bond

Approval."

3. If proprietary materials are proposed to be used, document in the project folder that they are on the product selection list in FDM 19-1-5. Otherwise, justification is required to be approved by BTO or BPD (and FHWA for oversight projects).
4. If federal funds are proposed to be used, an FHWA-37 authorizing the use of federal aid funds is required to be submitted and signed by FHWA prior to charging any costs.
5. Sufficient plan details or sketches need to be prepared to show the location of the work, what work will be done, what materials will be used and any notes that will be issued to direct the construction staff.
6. Nondiscrimination, Buy America, and Records Retention provisions are required per FDM 19-25 Attachment 10.3.
7. Actual project construction costs (i.e. labor, materials, equipment, etc.) need to be documented.
8. If the LFA project is within policy guidelines (see FDM Section 3-20, Attachment 11.1) the Region Project Development Chief shall formally approve the proposed work prior to initiating any construction activities. If a project element does not meet policy guidelines, the Chief of BPD's Project Services Section should be contracted to discuss the possible exception.
9. If the LFA (State or Local) project agreements ≤ $5000, include a copy of the executed LFA agreement in the project file. Send a copy of the signed LFA agreement directly to the Bureau of Financial Services to obligate funding. For LFA agreements >$5000, submit completed Forms DT25 and DT2056 to central office. Typically plan details as specified in #5 above are attached to DT2056. Central office will coordinate agreement execution and notify the region.

10.8 Developing a Local Force Account Agreement

The municipality, through interaction with the region, may proceed to develop an agreement after being informed by the region that the cost effectiveness finding and any exceptions to policy criteria have been approved. Agreement forms and guidance are located in FDM 19-25-5. See FDM 3-5-10.9 for information for developing a Cost Effectiveness finding.

10.9 Cost Effectiveness Findings

Guidelines for the preparation and approval of a cost effectiveness finding are discussed in Attachment 10.1 "A Policy on construction of state and Federal Aid Highway Projects by Forces and Equipment of Counties or Other Local Government Units." Questions about the policy should be directed to the staff of the Project Services Section in the Bureau of Project Development (BPD) for LFA's on local system, federally funded improvement projects, or the staff in the Traffic Systems Unit in the Bureau of Traffic Operations (BTO) for state funded maintenance projects.

10.9.1 Policy Requirements

Before a municipality will be allowed to enter into a force account agreement with WisDOT, it must show that the interests of the public will be best served by using municipality forces and equipment rather than those of a private contractor. This is done by making a Cost Effectiveness Finding (CEF), which documents the efficient use of labor, equipment, and materials and supplies to assure the lowest overall cost benefits the public's general interests.

The "Cost Effectiveness Finding" section of WisDOT policy lists two requirements.

1. The costs will be less than those costs that would be obtained through competitive bidding. This means that the municipality must show that they can do the work at less cost than under a let agreement, and
2. The municipality is properly staffed and equipped to perform the work. This means that they will not have to specially train their employees or buy equipment to do the force account agreement work. This provision does not preclude municipality from the limited use of specialized rental equipment (subject to the limitations discussed in the policy).

Additional guidance on the appropriateness of work for a force account agreement is included in Attachment 10.2 entitled "Summary Guidelines for Force Account Agreements."

A cost effectiveness finding will not be needed in certain cases where there is a finding of cost effectiveness on a program basis. The FHWA and WisDOT have determined that it is cost effective and in the public interest to use the force account agreement method on any highway system for these types of work:

1. Projects to adjust utilities and railroad facilities owned or operated by a public agency, railroad

company, or a utility company, provided they are qualified to perform the work in a satisfactory manner. See Part 635.205 of the Federal-Aid Policy Guide (FAPG).

2. Emergency repairs to restore services or to protect facilities, with the concurrence of the FHWA on federally funded agreements. See 23 CEF 635.204.

A programmatic cost effectiveness study has been approved for low-cost state or federally funded projects estimated at $50,000 or less. Attachment 10.4, "Justification for Force Account Agreements for $50,000 or Less," is required for all projects, including small HSIP projects to show they fall under the programmatic cost effectiveness study. A copy of the justification must be placed in the project files It should be noted that the state Cost Effectiveness Finding serves the same purpose as the federal Cost Effectiveness Finding.

10.10 Compliance Procedure

The municipality and/or WisDOT region, as appropriate, should follow these general steps when developing a force account agreement with WisDOT that is expected to cost more than $50,000.

1. Prepare a cost effectiveness finding and submit it to the appropriate region office of WisDOT.
2. Have the finding accepted by the Region Local Program Project Manager.
    - For LFA (Local System) projects, the region-accepted CEF shall be approved by the Chief of the Project Development Section in the region. For proposed projects outside of current policy parameters (see Attachment 10.1) contact the Chief of the Project Services Section in the Bureau of Project Development.
    - For LFA (State System) projects, the region-accepted CEF shall be submitted for approval to the Supervisor of the Traffic Systems Unit in Bureau of Traffic Operations.
3. Develop a force account agreement.
4. Submit a final agreement and final construction plans, specifications, and estimates (P.S. & E.) for approval. This includes forms DT25 and DT2056. These steps are described in detail below.

10.11 Prepare and Submit a Cost Effectiveness Finding

Very early in the development of a highway project, the sponsoring municipality should decide if it has the capability and wishes to construct the project with its own work force and equipment. For federally funded LFAs if the municipality feels the answer is yes, it should follow the Prequalification process discussed in Attachment 10.1. Once approved for a particular work category (or categories) the municipality should prepare (and submit to the appropriate Region Local Program Manager) a written cost effectiveness finding. For state funded LFAs the regions should prepare a written Cost Effectiveness Finding (CEF). CEFs must contain the following information.

1. Project location
2. Nature of the project
3. Proposed funding
4. Cost analysis
5. Total cost estimate
6. Private Contract Cost Comparison
7. Justification

Project Location: Describe where the project is located, its termini, and its length. Include a location map.

Nature of the Project: State what type of construction is proposed. Describe project concept in its entirety. Include work to be completed by LFA and work not included in the LFA. This includes locally funded completed with local forces, locally let and state let.

For federally funded LFAs, note that the policy states the types of work that are allowed and requires that a municipality be prequalified for the type of construction anticipated.

Proposed Funding: State the type of anticipated funding and the amount or percentage of construction costs that the municipality expects to pay. If there is some special interest or arrangement that may affect the amount the municipality will pay, it should be stated. This should be consistent with the State/Municipal Agreement (SMA). If funding options have changed since the SMA was signed, the SMA may need to be updated/revised.

Cost Analysis: All CEFs must include a cost analysis which is to be prepared in the manner set forth in the ten-

set method shown below. This involves estimating the unit cost of individual work items and multiplying these unit costs by the estimated quantity of each item to obtain item costs. The policy does not require a detailed cost analysis of force account agreement prices at this stage. Rather, the cost analysis needs to be only as detailed as it is necessary to show that it will cost less to do the work with municipality forces than with private forces. The use of rough but reasonable estimates of work quantities is acceptable. (It should be noted the preparer should complete the cost analysis as completely and accurately as possible to avoid having to update a previously approved CEF as detailed in Section 3.3).

This cost analysis will be updated later when the final cost analysis is completed as discussed in FDM 19-25-5. Current rates for wages and machinery rental may be used without updating to the construction year. Municipality experience under recent and comparable projects may be used to set production rates for personnel and equipment. An acceptable alternative method of making a cost analysis is to select realistic unit prices that resulted from a recent and comparable project done by the municipality's work force and equipment.

Because of the shorter time frame that generally exists for LFA projects on the STH system between the preparation of the cost effectiveness finding and the preparation of the agreement, it may be advisable to prepare the Final Cost Estimate required for the agreement at this stage.

To make a detailed cost analysis:

1. Isolate a work item and estimate its quantity.
2. Determine equipment that is needed to do that work.
3. Determine the number of personnel and their job classifications needed to do the work.
4. Determine the production rate of personnel and equipment.
5. Calculate hours of production by dividing the quantity by the production rate.
6. Calculate equipment cost by multiplying the hours of production by the current machinery rental rate.
7. Calculate personnel cost by multiplying the hours of production by the current labor rate for that classification.
8. Determine cost of materials.
9. Add the cost of equipment, personnel, and materials to get the total work item cost.
10. Divide the total work item cost by the quantity to get the cost per unit of work (unit price). This process is then repeated for each work item.

The cost analysis is an important part of agreement development, since it forms the factual basis for determining total cost of the project. An example is found in FDM 19-25-5. The example in FDM 19-25-5 is also applicable to LFA (STH) using SHRM Funding unless a process based on historical data as shown in Attachment 10.6 of this procedure is used instead.

Borrow pits, gravel pits, and quarries on federally funded LFA projects are to be located and details of loading and hauling determined at the time the cost analysis is prepared. The region should review changes in pit location as they may affect the analysis and subsequently require a change order to a LFA agreement.

Reimbursement for street lighting and traffic signal work performed by municipalities is also based on actual cost. The materials cost can be an actual purchase cost from a supplier or, if the municipality fabricates the signal or lighting equipment based on average unit cost from a supplier or, if the municipality fabricates the signal or lighting equipment, based on average unit costs supported by historical data. This average unit cost shall include the cost of labor, equipment, and materials to fabricate the signal or lighting equipment (which would be the material cost under an LFA project). Components of unit costs must be allowable under Office of Management and Budget Chapter II, Part 200 - Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (2 CFR 200. Average unit cost proposals submitted by a municipality are subject to audit and approval by the Bureau of Financial Services prior to execution of agreements.

Total Cost Estimate: This is the sum of item costs estimated above. The method of selecting unit prices from municipality experience will require multiplying each work item quantity by its unit price. The estimate should state the quantity, cost of each work item, and total agreement cost. An example is shown in FDM 19-25 Attachment 5.3. While unit costs may be used to estimate item costs and total agreement cost, it should be remembered that final reimbursement for work performed will be based on actual costs, limited to the total agreement cost (as amended by change orders as discussed in CMM 2-42.2, no change in scope for Local Force Account State).

Note that the policy sets criteria for the allowable dollar size of projects. Exceeding these limitations on federally

funded projects must be justified and approved by the Bureau of Project Development Director. The Chief of Project Services Section will facilitate the review of exceptions.

Specialized Equipment Rental: Summarize the specialized equipment to be used to complete the project. Include total cost for each piece of specialized equipment and an overall percentage of the agreement amount. Remember; specialized equipment may be rented up to a maximum of $25,000 or 25% of the agreement amount, whichever is less.

Private Agreement Cost Comparison: After determining the total cost if the municipality constructs the project, municipal officials must compare that total with the estimated cost if the project was done by a private agreement or under a competitive bidding process. Unit prices may be established by review of recent and comparable WisDOT let contracts and/or locally let contracts awarded to private firms. WisDOT let contract information is available in the region offices or can be accessed at the DOT website:

http://wisconsindot.gov/Pages/doing-bus/contractors/hcci/bid-let.aspx

Local cost information is acceptable but will require a reason for using the local cost information and a submittal of source information for verification. The source of the comparable information must be documented in a narrative detailing the source of comparables, methods used in estimating the unit prices and any differences in comparables/items. Lack of available contractors in the area or a lack of interest on their part should be considered in setting unit prices and documented. From these unit prices the municipality should develop a private contract cost estimate. Comparison of the two totals must show a cost savings under a force account agreement.

Any difference in the project items and/or quantities between the cost analysis and the private contract cost comparison must be supported by a detailed explanation.

Design engineering and construction administration costs should not be considered when determining cost effectiveness.

Justification: This part of the cost effectiveness finding will consist of positive statements addressing each of the two requirements of the "Cost Effectiveness Finding" section of the policy. Emphasis should be placed on the cost effectiveness of the municipality's proposal.

Attachment 10.3 shows a standard format that addresses each of the above points for LFA (Federal Funded) on Agreements greater than $50,000.

Attachment 10.5 shows a format that the region can use to forward the local request to the central office for final approval of the cost effectiveness finding.

If the LFA agreement on the STH system will exceed cost limits contained in FDM 3-5-10.7, add a paragraph to the letter to the BTO Traffic Systems Unit to acknowledge that the limit(s) are exceeded, note the amount by which exceeded, state the necessity for it and request an exception to the individual project limit. LFAs on the local system that exceed the cost limits should be forwarded to the Project Services Section in the Bureau of Project Development with similar documentation.

10.11.1 Approving a Cost Effectiveness Finding

LFA (State System): The Division Administrator has authorized the Supervisor of the Traffic Systems Unit in BTO to approve or disapprove all CEFs for LFAs on the STH system except as noted below.

LFA (Local System): Municipalities will submit the CEF to the region local program Management Consultant (MC) for LFAs managed through the MC. The MC will review the CEF, ensuring that the CEF contains all required documentation, and cost estimates are realistic. If the review is satisfactory, the MC will recommend approval of the CEF to the WisDOT region Local Program Project Manager. If the proposed project is within policy limits and the Region Local Program Project Manager concurs with it, the CEF will approved by the Chief of Project Development Section in the region.

The Division Administrator has authorized the Chief of the Program Development Section in the region to approve or disapprove all CEFs for LFAs on the local system except as noted below.

The Administrator will approve or disapprove those cost effectiveness findings proposing to exceed policy limits for project type, cost, or region quota. Action by the Administrator will be considered an approval or disapproval of both the cost effectiveness finding and the exception.

As stated previously in this procedure, certain types of projects do not require a separate cost effectiveness finding as they are covered by a prior determination made by the FHWA. However, the Director of either the Bureau of Project Development or Bureau of Traffic Operations is to be advised by the region of the project location, type of work, estimated quantities, total cost, and anticipated savings over a let agreement. This is to

be done before preparation of a force account agreement is begun.

10.11.2 Updating an Approved Cost Effectiveness Finding (Federal Funded)

In most cases once the CEF is approved it will not need to be revised. However, if the Final Cost Estimate total costs are more than 10% greater than the cost as shown in the approved CEF, or there is a change in scope from the approved CEF, or if the year of construction is more than two years past the date of the approved CEF, the previously approved CEF will need to be revised and re-submitted for approval. The update should be similar in format to the initial CEF and include both the revised total cost estimate and an updated private cost comparison. The updated CEF is to be submitted to the Region MC for review. The Region MC will review the justification and, if satisfactory, will recommend approval to the Region Local Program Project Manager for approval. The Region Local Program Project Manager will have approval authority for any updates to the CEF.

10.11.3 Submitting the Agreement and PS&E

Refer to FDM 19-25-5 for the composition and processing of LFA agreements and P.S. & E. submittals. Necessary agency approvals are discussed in FDM 19.

10.12 Region Limitations On Force Account Agreements

Refer to Attachment 10.1, "A Policy on Construction of State and Federal-Aid Highway Projects by Forces and Equipment of Counties or Other Local Governmental Unit" for limitations on Force Account Agreements

10.13 Cost Effectiveness Findings for Contract Modification for Local Force Account Local (Federal Funded)

During construction, if new items are added to the agreement, documentation should follow the same process as a contract modification on a let project. The documentation should follow the CEF process, including detailing the Municipality's estimated costs as compared to a private contract cost for the new items.

10.14 Cost Effectiveness Findings at Completion of Construction for Local Force Account Local (Federal Funded)

Upon review of the final actual cost at the completion of construction, the project leader should evaluate the municipality's final actual cost and compare it to the final cost estimate submitted at PS&E. For any cost increases from the original or modified agreement amount, the Municipality should provide justification. The cost over the agreement amount should be reviewed to determine if they are eligible for reimbursement.

10.15 Periodic Evaluation of Cost Effectiveness Findings (Federal Funded)

The information from the review of individual projects at the completion of construction should be summarized as part of a periodic evaluation of CEFs. The purpose of the periodic evaluation is to ensure the process is working as intended and that LFA projects completed are cost-effective.

10.16 Filing Cost Effectiveness Findings

In addition to the original of each CEF being filed in either the region files (for LFA's on the local system) or Central Office Files (for LFAs on the STH system), an additional copy of each CEF shall be filed, by state fiscal year, in Central Office Files. Regions shall send the additional copy to Central Office Files, Hill Farms Room 651 stamped "Agency Copy" - SAVE FOR THREE YEARS".

LIST OF ATTACHMENTS

Create FDM 3-5 Attachments 10.1 to 10.7 by combining former FDM 3-20 Attachments 11.1 and 11.2 and FDM 11-20 Attachments 12.1 to 12.5. Other than title changes, no new text or edit changes.

Attachment 10.1	A Policy on Construction of State and Federal-Aid Highway Projects By Forces and Equipment of Counties or Other Local Governmental Units
Attachment 10.2	Summary Guidelines for Force Account Agreements
Attachment 10.3	Justification for Force Account Agreements more than $50,000 (LFA Federal Funded)
Attachment 10.4	Justification for Force Account Agreements $50,000 or Less (LFA Federal Funded)
Attachment 10.5	Correspondence/Memorandum (Local System)
Attachment 10.6	Correspondence/Memorandum (State System)
Attachment 10.7	Letter of Approval for Programmatic Cost Effectiveness Finding